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. See the General Policies chapter in this catalog for a full statement of the university’s Equal Opportunity and Nondiscrimination Policy.
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About George Mason University

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Vision for the New 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

Faculty and Students
The university’s more than 1,000 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. Faculty members 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, and have won Fulbright Scholar grants and Mellon Fellowships.

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. Each semester's Schedule of Classes provides details about courses taught by Robinson Professors.

The majority of the university’s more than 30,000 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**

Mason is a distributed university, with campuses in Fairfax, Arlington, and Prince William counties, and satellite sites in Loudoun County, Herndon, Reston, 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 continues to be 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; Theater of the First Amendment, Mason’s professional theater company; 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.

**Arlington Campus**

The Arlington Campus is located near Washington, D.C., on 5.2 acres of land. Mason's most urban location, the Arlington Campus offers convenient access via Metro and key transportation routes. It currently comprises three buildings: the Original Building, formerly known as the Kann's Department Store; Hazel Hall, which is home to the School of Law; and 3330 Washington Boulevard, a leased facility. The George Mason University Foundation also supports the Arlington Campus with a building that includes parking; 192,000 square feet of leased office space; and 13,000 square feet of retail space.

The newest structure being erected on this campus is Founders Hall, part of a three-phase plan to develop the overall site. Founders Hall will provide 256,000 square feet of space that will include the new home for the School of Public Policy, and space for the School of Law, as well as academic and student support services. In addition, the building will feature a 300-seat auditorium, a public plaza, a large multipurpose room, and three levels of underground parking, which will provide 443 parking spaces. Occupancy is anticipated for fall 2010. This additional space will enable the university to highlight and showcase much of the exciting work taking place at the Arlington Campus—as well as throughout the university—through the hosting of conferences, meetings, and other events. Once complete, the Arlington Campus will include 750,000 square feet of space and many new facilities to accommodate its projected 8,000 undergraduate, graduate, and professional students.

The Arlington Campus is also home to the Institute for Conflict Analysis and Resolution, as well as programs in social work, nonprofit management, arts management, business administration, and Initiatives in Educational Transformation. The Volgenau School of Information Technology and Engineering offers special certification courses in information technology through its TechAdvance Program through the Office of Continuing Professional Education. 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—independent initiatives affiliated with the university—can also be found on the Arlington Campus. The Center for Global Studies; Center for Justice, Law, and Society; Critical Infrastructure Protection Program; Interdisciplinary Center for Economic Science; and Interdisciplinary Center for Regional Economic Competitiveness are also located there.

Prince William Campus

The Prince William Campus is located on 124 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. The campus comprises four buildings: a research facility, two academic buildings, and a recreation and fitness center.

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.

A major focus of the campus is research and academic programs in the life sciences, including biodefense and infectious diseases, cancer proteomics, genomics, and bioinformatics.

Construction is under way on the university’s Biomedical Research Laboratory, a regional biocontainment facility funded in part by the National Institute of Allergy and Infectious Diseases. The laboratory will house research on emerging infectious diseases and those caused by biological threat agents.

Programs in nursing, teacher education, administration of justice, business, 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, student lounge space, an intercampus shuttle bus 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 cocurricular 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 110,000-square-foot Freedom Aquatic and Fitness Center 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. It is also home to Mason’s human performance lab, classrooms, and other meeting space.

The Mason Enterprise Center, part of the university’s network of enterprise centers, has played a major role in enhancing commerce and developing new programs in support of small businesses throughout Virginia. The center brings this experience and diversity of services to support growing businesses and entrepreneurs in the Manassas and Prince William County areas. It also offers a telework center for low-cost telecommuting in a professional office environment.

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, which will be completed in 2010. The Hylton Performing Arts Center will educate, entertain, and enrich the community by providing world-class venues and resources for community arts groups; business, civic, and service organizations in the region; Prince William County and Manassas school students and teachers; Mason students and faculty; and outstanding professional performances by artists from around the world.

Mason in Loudoun
Mason’s new Loudoun County operation—Mason in Loudoun—aims to connect 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 Loudoun area workforce and residents to study in a number of exciting areas, while offering current students a local option toward completion of degree program requirements.

Mason in Loudoun offers course work in nursing, health science, education, information technology, and management, along with undergraduate general education courses. Full programs are available in several fields. The operation will rapidly expand its range of courses as student demand and opportunities suggest. Students enrolled in Loudoun enjoy the same rights, privileges, and access as those on Mason’s Fairfax, Arlington, and Prince William Campuses.

**Satellite Sites**

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

Each spring the university offers a Smithsonian Mason Semester at the National Zoo’s Conservation and Research Center in Front Royal, Virginia. Students live on site at one of the most significant conservation facilities in the world and work with prominent research scientists, educators, and conservation practitioners in a unique learning community.

**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 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 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 29 years, enrollment has risen from 4,166 to more than 30,000 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 1984, the first Robinson Professors, a group of outstanding scholars committed to undergraduate teaching and interdisciplinary scholarship, joined the faculty as the result of a generous bequest from the estate of Clarence J. Robinson.

Drawing prominent scholars from all fields, Mason’s outstanding faculty includes Pulitzer Prize winners, a Nobel laureate, Institute of Electrical and Electronics Engineers Centennial Medalists, and recipients of numerous Fulbright, National Science Foundation, and National Endowment of the Arts grants and awards, among others. More than 30 endowed chairs at the university have also brought many international renowned artists and scholars to 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 Information Technology and 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 Theater 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. Innovation Hall on the Fairfax Campus was completed in 2003 and holds state-of-the-art electronic classrooms and a television studio. In 2006, the university opened its first facility dedicated to research. Research I contains an observatory and laboratories for a number of campus research centers. Plans for Research II are already under way. New academic buildings supporting the Volgenau School of Information Technology Engineering and the Department of Art and Visual Technology will open in 2009–10.

The university has achieved national distinction in many areas. Its reputation continues to grow as Mason provides educational, cultural, and economic resources for not only the people of Virginia, but also the nation and the world.

**University’s Mission**

George Mason University is innovative and entrepreneurial in spirit and uses its multicampus organization and location near our nation’s capital to attract outstanding faculty, staff, and students. 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.

Accreditation

Mason 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 information about the accreditation of George Mason University.

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
- Nondegree 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 April 1 for transfer applicants. The application deadline for the spring semester is October 15. 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. Candidates for this program must arrange an interview with the dean or director of admissions.

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 prebusiness, chemistry, computer science, engineering, geology, mathematics, or physics. Note that one unit equals one academic year of study.

<table>
<thead>
<tr>
<th>Required Minimum</th>
<th>Recommended Minimum</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1)</td>
<td>(2)</td>
</tr>
<tr>
<td>English</td>
<td>4</td>
</tr>
<tr>
<td>Social Studies</td>
<td>3</td>
</tr>
<tr>
<td>Mathematics*</td>
<td>3</td>
</tr>
<tr>
<td>Laboratory Science**</td>
<td>2</td>
</tr>
<tr>
<td>Foreign Language</td>
<td>2</td>
</tr>
<tr>
<td>Other Academic Electives</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>17</td>
</tr>
</tbody>
</table>

*Selected from algebra I, algebra II, geometry, trigonometry, analytic geometry, functions, math analysis, 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 form in the admission packet and submitting it to the university with an enrollment deposit. The deposit is nonrefundable after May 1.

**Transfer Requirements**

Application for admission as a transfer student is competitive. Transfer applicants must submit official transcripts from each collegiate institution attended. Transfer applicants with fewer than 30 transferable credits must also submit a copy of their secondary school record and test scores. All non-native English speakers are also required to submit a TOEFL or IELTS score or acceptable grades (C or better) in at least two English composition or literature classes taken at another U.S. university or college.

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

Transfer applicants who have been out of school for a semester or longer, excluding summers and school-designated breaks, must provide the Admissions Office with a statement describing activities during this period. A résumé may be submitted in lieu of a statement.

**Transfer Credit**

A student transferring to Mason receives a formal evaluation of transfer credit after admission and receipt of enrollment confirmation by the Office of Admissions. The student is responsible for seeing that the Office of Admissions receives official final transcripts of all course work taken elsewhere.

In general, credits are accepted from regionally accredited institutions, 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 unaccredited institutions. Course work from institutions not included in the admission application will not be eligible for transfer credit.

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 some 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 enrolled on a campus of the Virginia Community College System (VCCS) may access credit equivalency and articulation information at admissions.gmu.edu/TransferGuide.

Students accepted into a degree program at Mason are usually not expected to pursue simultaneous course work elsewhere. For more information, go to the Credit to Be Earned at Other Institutions section in the Academic Policies 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 accredited institution must be conducted through the Office of Admissions. 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. While this contract will detail college-level and major requirements to be met, these students do not have to meet Mason’s university General Education requirements.

**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 Registrar’s Office or 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 international with F-1 or J-1 immigration 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.

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 must be 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 may be higher for some graduate programs. For students with postbaccalaureate 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.

**Graduate Application Requirements**

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

- Completed 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. 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 in the Application for Graduate Study, 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)**
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)**
4400 University Drive, MS 5A8
Fairfax, VA 22030
Phone: 703-993-1736
College of Science (COS)
Graduate Admissions
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)
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 Information Technology and Engineering

For master’s and certificate programs, and nondegree studies
4400 University Drive, MS 3D5
Fairfax, VA 22030
Phone: 703-993-1242
Fax: 703-993-1633
E-mail: itegradm@gmu.edu

For PhD programs
The Volgenau School PhD Processing Center
4400 University Drive, MS 5C8
Fairfax, VA 22030
Phone: 703-993-1512
Fax: 703-993-1633
E-mail: itegradm@gmu.edu

School of Law
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)
4400 University Drive, MS 5A2
Fairfax, VA 22030
Phone: 703-993-2136
Fax: 703-993-1778
E-mail: somgrad@gmu.edu

School of Public Policy (SPP)
Graduate Admissions
3401 Fairfax Drive, MS 3B1
Arlington, VA 22201
Phone: 703-993-8099
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 required of all applicants seeking admission to any SOM degree program. Students may schedule the computer-based GMAT online at www.mba.com. The various programs at Mason all have separate GMAT codes. For the appropriate code for your program of interest, go to www.mba.com.

The GMAT is also permitted for some programs in the Volgenau School of Information Technology and Engineering. Be sure to send your score to Mason by using the correct program code.

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.

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.

The TOEFL is required of all applicants whose native language is not English and who have not received a degree from a university in the United States, Canada, United Kingdom, Australia, or New Zealand. To have TOEFL scores sent to Mason, use school code 5827.

The IELTS may be substituted for the TOEFL. Please see this chapter for additional information on English language testing requirements. Further information can be found at www.toefl.org and www.ielts.org.

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.

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, and no new time limit is given. For students seeking a change between two colleges, 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

Applicants planning to begin graduate work in a summer term must complete a standard application for graduate admission and be formally admitted before registering for classes. Note: Not all graduate programs 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 admission documents, including academic records sent from other institutions, become part of the official university file and cannot be returned nor duplicated for any purpose. Students should maintain copies of official credentials for other personal use.

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 holding or seeking F-1 or J-1 visas should be made directly to the Office of Admissions. Deadlines for the fall semester are before January 1 for undergraduates and February 15 for graduates. For the spring semester, the deadline for all applicants is October 1. These deadlines ensure adequate time to process applications and prepare immigration documents. All international applications must be accompanied by a nonrefundable application fee. Items that must be submitted with the application form 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 or IELTS exam); the International Student Information Form; financial support documents; copy of passport identification page; and for those present in the United States, copies of immigration documents verifying current nonimmigrant status. 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 International Student Information Form.

International students outside the United States must take the immigration document to the U.S. embassy or consulate nearest their place of residence and apply for an F-1 or J-1 student visa. The basic requirements for obtaining a student visa are a letter of admission, evidence of financial support, an immigration document issued by the school they wish to attend, a valid passport, and proof of strong ties to the home country. 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 International Student Information Form 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 transfer student is one who has completed course work at a 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.
- Applicants must demonstrate English proficiency. Applicants whose native language is not English are required to submit TOEFL 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. Official test scores must be sent directly from the Educational Testing Service or IELTS. For more information, contact the Educational Testing Service, CN 6151, Princeton, NJ 08541-6151, USA; phone: 609-921-9000; web site: www.toefl.org, or the IELTS web site at www.ielts.org.
- 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 suggested evaluation agencies is available in the Admissions Office or at www.naces.org.
- 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:

- Applicants must complete the Application for U.S. Graduate Study.
- Applicants must demonstrate English proficiency. Applicants whose native language is not English are required to submit TOEFL 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 (with a minimum score of 20 in each section), or 570 on the paper-based TOEFL and 4.5 on the TOEFL essay. A TOEFL score of at least 250 (computer-based) or 600 (paper-based) is required to qualify for a teaching or research assistantship. Official test scores must be sent to the admissions office directly from the Educational Testing Service. In addition, students may substitute the IELTS exam in lieu of the TOEFL. The IELTS total score must be 6.5 or higher.
- 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.

**Special Conditions for International Applicants**

In addition to the academic requirements listed above, international students must meet the following conditions:

- 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 on F-1 or J-1 nonimmigrant status must maintain full-time enrollment each semester (12 credits for undergraduate, usually 9 credits for graduate), excluding summer term. Because of this requirement, F-1 or J-1 international students do not qualify for part-time programs nor can they begin their program in the summer.

- Prospective students who seek to enter the United States on F-1 or J-1 immigration status, or seek to transfer to Mason if already in the United States must complete the International Student Information Form, which can be downloaded from admissions.gmu.edu. The form and financial support documents must be submitted to the Admissions Office along with the application.

- For students already in the United States, copies of immigration documents verifying current nonimmigrant status must be submitted with the application form.

- To be issued an immigration document, sufficient evidence of financial support, including an original bank statement, scholarship letter, sponsor’s salary statement, or graduate assistantship offer letter, must be provided to cover the first year of study. Students must also demonstrate the source of financial support for all subsequent years of the program. The International Student Information Form gives an estimate of annual expenses, including tuition, living expenses, and health insurance. Students may not submit statements of stocks, bonds, or company assets. Financial support statements must show available cash and not be more than six months old.

- All new students at the university must submit an Immunization Record Form Card signed by a health professional. The form, available at shs.gmu.edu/immunizations verifies that immunizations are current. The immunizations required are measles/mumps/rubella and tetanus/diphtheria. Hepatitis B (series of three) and meningococcal vaccines are encouraged. A tuberculosis screening is required of students from high-risk countries as determined by the Centers for Disease Control and Prevention.

- 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 Cash Office.

International students are required to purchase insurance for the entire year. If a student graduates or terminates enrollment after the fall semester, has not submitted any claims and will leave the United States, the student may apply for a spring refund. The student must submit a written refund request to the Student Health Insurance Office. The refund request will be sent to the insurance company. Submission of a request does not guarantee that a refund will be issued. Refunds are granted by the insurance company, not George Mason University. For more information, please contact the Mason Student Health Insurance Office.

**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 review a student’s health insurance policy to verify coverage.

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.

Nondegree Enrollment

Nondegree Status

Nondegree 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 nondegree applicants must complete a nondegree online application for admission and supply official transcripts from all postsecondary institutions they have attended. High school guest matriculant applicants must submit an official high school transcript, as well as SAT or ACT scores. Secondary school reports and a written recommendation from their guidance counselor are also preferred.

Nondegree applications and their established deadlines are available online at admissions.gmu.edu.

Standards for Admission

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

Graduate Nondegree

Applicants seeking to take graduate-level courses or graduate prerequisite courses must meet graduate admission standards. These students will be considered graduate level even if they are taking undergraduate courses. Individual units and majors may have additional requirements for nondegree graduate status (see below). A student cannot graduate or receive a degree while in nondegree status. 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 nondegree status. Students who plan to seek a degree from Mason are strongly encouraged to apply for degree status admission as soon as possible.

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

Undergraduate Nondegree

Applicants who do not have a bachelor’s degree but have graduated from high school or received a GED and have earned a minimum of 24 transferable credits may apply for nondegree admission. Transcripts from all colleges attended are required. High school transcripts and SAT or ACT scores may be requested.
Applicants with a bachelor’s degree seeking to take undergraduate courses toward a second bachelor’s degree or for personal development 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 nondegree graduate application and be reconsidered for admission.

Nondegree 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 nondegree 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 Guest Matriculants

High school juniors or seniors 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 guest matriculants. These applicants will be evaluated based on their academic performance in high school. Recent SAT I or ACT scores and recommendations from guidance counselors and teachers may also be requested. 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 matriculant will transfer to other institutions.

Academic Advising

On initial enrollment, nondegree 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 nondegree studies remain a part of the student’s permanent nondegree record and are recorded on the standard university nondegree 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 nondegree credit to the degree program.

Senior Citizens

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. Senior citizens who meet 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.

Citizens who wish to take advantage of this act must complete the online nondegree or degree application found at admissions.gmu.edu. On approval of their admissions application, senior citizens can request a waiver of tuition and enrollment fees by completing the Senior Citizen Tuition Waiver Form, available from the Registrar’s Office 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 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 Registrar’s Office when registering for classes. Students seeking to enroll in noncredit courses should call the Office of Continuing Professional Education at 703-993-2109. 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
registration policies and follow normal procedures to add and drop courses within the deadline dates outlined in each semester’s academic calendar.

Graduate Nondegree Status

The Volgenau School of Information Technology and Engineering

Admission for nondegree graduate study is suitable for those individuals who do not want to pursue a degree but are interested in taking graduate courses from the Volgenau School of Information Technology and Engineering. The Volgenau School nondegree graduate application forms are available at admissions.gmu.edu. The following application materials should be submitted for consideration:

- The Volgenau School online nondegree application
- Official transcripts indicating confirmation of bachelor’s degree
- Nonrefundable application fee

Approval for nondegree status does not guarantee admission to a degree program at a later date. Up to 12 credits taken in nondegree status may be transferred to a Volgenau School degree or certificate program, subject to the general rules for transfer of graduate credit. Students who do not register for the term for which they are accepted may have their enrollment postponed for one semester on written request to the Admissions Office. More information about the Volgenau School programs and course offerings may be obtained from the Volgenau School departmental offices or the Volgenau School Graduate Admissions Office, Science and Technology II, Room 133, 703-993-1512.

College of Science (COS)

Nondegree status is available for professionals who are interested in taking a limited number of courses without committing to a degree or certificate program. Up to 12 credits taken in nondegree status may be transferred to one of the COS academic programs at a later date. Approval for nondegree status does not guarantee admission into an academic program. For admission into nondegree status, the student should have a 3.00 GPA or higher and a BS degree in mathematics, computer science, engineering, natural science, or a related field. Exceptions are reviewed on an individual basis.

The following application materials should be submitted for consideration:

- COS nondegree application
- Official transcripts
- A nonrefundable application fee
- Résumé

The COS nondegree application can be downloaded from cos.gmu.edu.

School of Public Policy (SPP)

Students are welcome to apply for nondegree study in SPP for fall and spring semesters only. To apply, students should complete the nondegree application online at admissions.gmu.edu/applynow. In addition to completing the online application, students are required to submit official transcripts from all institutions attended. Non-native English speakers must present a minimum TOEFL score of 230 on the computer-based exam or 570 on the paper version. For more information, call the SPP Admissions Office at 703-993-8099.

Summer Term
Summer enrollment provides an opportunity for eligible undergraduate, graduate, and nondegree 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 nondegree students begins in late March to early April. Students who are new to Mason are required to apply and may do so at admissions.gmu.edu/applynow.

Academic Testing

Advanced Placement and Credit by Exam

Academic departments frequently revise information regarding credit by exam. The most current information can be found at admissions.gmu.edu/exams.

Mason Departmental Exams

Proficiency exams are offered in a number of courses usually taken during the first two years. Credit is recorded for grades of C or above, which does not affect the student’s GPA. 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 Proficiency Exam

Students who pass the English 101 Proficiency Exam will receive 3 credits for English 101. The three-hour essay is based on a choice of topics. The exam is scheduled periodically during the semester. For more information, go to the English Department’s proficiency exam web site composition.gmu.edu/students/exemptions/engl101.php.

English 302 Advanced Composition Exam

Students seeking exemption from English 302 may submit a written portfolio to the English Department. To qualify, the written portfolio must demonstrate proficiency equal to that of students who have successfully completed English 302. The prerequisite for taking the English 302 advanced composition exam is completion of 45 credits, completion of English 100 or 101, and completion of the literature requirement for the major. The English Department will accept a portfolio between September 1 and April 8. Additional information regarding the English 302 exam can be found at composition.gmu.edu/students/exemptions/engl302.php.

Foreign Language Placement

The College Board SAT II test in a foreign language is used for placement in Chinese, French, German, classical Greek, Italian, Latin, Russian, and Spanish. Freshman applicants who wish to receive the appropriate foreign language placement should take this exam during their senior year in high school. Students who have not taken the SAT II in a foreign language may take it in the foreign language lab once they are on campus. The SAT II exam 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 they must consult the Department of Modern and Classical Languages to determine correct placement.
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 online at mcl.gmu.edu/resources/placement_testing.html. Specific information on interpreting test scores can be obtained from the Department of Modern and Classical Languages.

Students may not enroll for credit in a course at a level lower than the one in which they are placed. Students and instructors should attempt to identify and resolve cases of inappropriate placement during the first days of each course. For students whose degree program contains a foreign language requirement, the placement determines the maximum number of credits, if any, that will be needed to fulfill the requirement.

A foreign language placement is not required of international students who present evidence of having studied for four or more years in an educational institution where the primary language of instruction was other than English. These students will be considered to have fulfilled the foreign language requirement, but they are not eligible for credit for course work below the 300 level.

If through transfer credit, a placement test score, or Mason course work, a student meets the prerequisite for a lower-division foreign language course that is not offered during a particular semester, the dean usually grants permission to continue the foreign language sequence by allowing the student to take courses at another college or university.

**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 AP credit or transfer credit. The web address for the math placement test schedule is cos.gmu.edu/academics/undergraduate/math_placement_testing.
Tuition, Expenses, and Financial Aid

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

North Chesapeake Module, Room 11
4400 University Drive, MS 2E2
Fairfax, VA 22030
Phone: 703-993-2484
Fax: 703-993-2490

Tuition and Fees

General Guidelines

- Students are responsible for maintaining current addresses via Patriot Web (patriotweb.gmu.edu) and 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 dropping, by the dates listed in the Academic Calendar, all classes (including waitlisted classes) they do not plan to complete. Students must follow the drop and withdrawal procedures published in the electronic Guide to Registration. Full or partial tuition liability may apply.

- 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.

- Failure to receive a reminder bill confirming charges does not waive the requirement for payment when due. Balances may be verified and paid via Patriot Web (patriotweb.gmu.edu).

- Payments are due in the Cash Office, Student Union Building I, Room 104, on or before 4:30 p.m. on due dates, regardless of postmark if mailed. Check and credit payments made on Patriot Web must be completed by 10:30 p.m. to be considered in that day’s business.

- 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 loan borrowers must submit a completed promissory note at least four weeks before the payment due date to the Financial Aid Office (South Chesapeake Module) for these funds to be considered in your balance. 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.

- 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.

- Payments not received by the due date will be assessed a late payment fee, which is 10 percent of the balance due up to $125.

- Students who add their first class on the first day of the semester or after are assessed a $125 late registration fee. The fee does not apply to students already registered prior to the start of classes who make schedule adjustments. Waitlisted
classes are not considered class registration.

- 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 from traffic or parking violations, incomplete immunization records, fines owed to the Mason or Washington Research Library Consortium libraries, and other administrative holds.

- Nonreturning students are responsible for dropping courses for the semester and ensuring they do not have an outstanding balance on their account. Any documentation or intent made to the Admissions Office that you are not returning does not withdraw you from the registered courses. Please drop courses and check your account status via Patriot Web.

- Students enrolling in Mason off-campus courses are assessed tuition and fees at the same rates as those for on-campus courses.

- A few 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.

2009–10 Semester Tuition Charges (subject to change)

Approved tuition rates are available June 1. For more information, call Student Accounts at 703-993-2484 or go to studentaccounts.gmu.edu. Also, students are charged tuition rates according to their academic level; graduate rates vary.

<table>
<thead>
<tr>
<th>In-State Undergraduate</th>
<th>In-State Graduate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full-time (12–16 credits)</td>
<td>$3,756</td>
</tr>
<tr>
<td>Per credit</td>
<td>$313</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Out-of-State Undergraduate</th>
<th>Out-of-State Graduate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full-time (12–16 credits)</td>
<td>TBA</td>
</tr>
<tr>
<td>Per credit</td>
<td>TBA</td>
</tr>
</tbody>
</table>

* Graduate students are charged by the credit.

Related Fees

These are applicable to all students and are subject to change:

- Application Fee, Undergraduate | $50
- Application Fee, Graduate | $70
- Lab Fee | $25
- AVT Arts Bus Fee | $55
AVT, SOM Course Fee (per credit) $20
VSITE, CVPA, SCS Course Fee (per credit) $10

Orientation/Undergraduate

New Student Fee $160 (nonrefundable)
Graduate New Student Fee $60 (nonrefundable)
International Student Health Insurance Fee $1,366

Note: The new student fees are mandatory, nonrefundable, one-time fees. Fees are charged to the account of every newly admitted, degree-seeking student when registered for classes regardless of orientation attendance or enrollment status.

Payment Information

Payment Deadline

Payment is due the first day of the semester. Payments received at the Cash 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. Allow ample time for processing payments.

Methods of Payment

Cash: At window only, Cash Office, SUB I, Room 104

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.

Credit Card: Payments are accepted online through Patriot Web.

Delivery Methods

Web: Patriot Web, patriotweb.gmu.edu online checks, or credit cards

Window: Cash Office, SUB I, Room 104, Monday through Friday 9 a.m. to 4:30 p.m.

Drop Box: Outside Cash Office, SUB I, Room 104

U.S. Mail: George Mason University, Cash Office, 4400 University Drive, MS 2E1, Fairfax, VA 22030. Postmarks are not considered proof-of-payment date.

Semester Payment Plan

The Mason semester payment plan is available for students who need to budget a minimum of $500 and wish to make two payments. Payments for Study Abroad, Global Education, and International Student Health Insurance cannot be deferred. A payment contract, available on the Student Accounts web site, must be submitted to the Cash Office with a down payment of one-half of the contract amount plus fee. The contract fee is $25 and nonrefundable. Failure to pay the outstanding balance will result in a financial hold, a late fee up to $125, and normal university collection activity. Failure to pay may prevent students
from being eligible to use this contract in future semesters. Please refer to studentaccounts.gmu.edu for up-to-date payment plan options.

**Third-Party Billing Authorizations**

Students using a third-party billing authorization will be charged a $25 processing fee. Students must provide the third-party authorization or government training voucher to the Student Accounts Office, North Chesapeake Module, Room 11, or fax it to 703-993-2460 before the payment due date. 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.

**Penalties**

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

Failure to make any payment on or before the due date results in a late payment fee that is 10 percent of the balance due up to $125.

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

**Returned Checks**

A $25 returned check fee will be charged for each unpaid check returned by the bank. If the returned check results in an unpaid account, an additional late fee up to $125 may be charged and financial suspension will result.

**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 for traffic or parking violations, incomplete immunization records, fines owed to the Mason or Washington Research Library Consortium libraries, and other administrative holds.

**Collections**

Failure to meet financial obligations to the university may result in the delinquent account being placed with a collection agency, the withholding of money from tax returns, and other collection procedures. Students are responsible for costs incurred by the university to collect delinquent accounts.

**Dropped Courses**

Students are required to pay full or partial tuition for courses they drop after the last day to drop with full tuition refund, including drops 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 liability is 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 five 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 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 permanent address listed in the student record. In person, check pick up 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 Registrar’s Office 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 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 in the Academic Policies chapter.

**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 Admissions chapter.

**Music Instruction**

Private music instruction is arranged through the Department of Music on a fee-paying basis. A half-hour lesson (1 credit) is $164.50; an hour lesson (2 or 3 credits) is $329. Note that this fee is subject to change.

**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 Virginia domicile guidelines. Copies of the guidelines and other applicable state laws are available from the Office of the 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 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 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 Registrar or the Third Level Domicile Appeals Committee. These requests must be filed in a timely manner as stated in denial letters. Forms are available from the Registrar’s Office 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 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 Domicile Administration in the Registrar’s Office in North Chesapeake Module, Room 8; 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 traditional-style residence halls, suites, apartments, 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 2009–10 academic year have been approved. Please refer to the Housing and Residence Life web site for rate information. All students in housing must provide a prepayment, which is applied to the spring 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 student rooms.

Students living on campus are required to sign an academic year contract. Releases from the contract are only granted when Housing and Residence Life determines that a significant unforeseen hardship exists. For more information, contact the Office of
Housing and Residence Life, located on the ground floor of Potomac Heights in the wing closest to the Aquatic and Fitness Center.

**Dining Services**

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

Mason Dining provides a wide variety of dining options for the Mason community on the Fairfax, Arlington, and Prince William Campuses. The Fairfax Campus has food courts in SUB I and the Johnson Center that include Burger King, Chik-fil-A, Taco Bell Express, Sangam's, Jazzman's Cafe, Mein Bowl, and Damon's Restaurant. In fall 2008, the Fairfax Campus opened Southside, a dining location with six stations offering fresh, healthy meals prepared by our chefs. Check our web site for information on dining options on the Arlington and Prince William Campuses and for a full listing of our options and service times.

For the 2009–10 academic year, a variety of meal-plan options are available for resident students, off-campus students, faculty, and staff. Check the web site for details.

**Dining Plan Changes**

Meal Plan Office
SUB II, Lower Level, Room 1013
Phone: 703-993-2870
Web: www2.gmu.edu/dpt/allunivcard/mealplans/index.html

Increases in meal plans may be made at any time; however, the last day to decrease mandatory meal plans coincides with the last day to add classes. Seniors with 90 credits or students living in the townhouses, apartments, Liberty Square, or Potomac Heights are not required to have a meal plan. Changes must be made at the Meal Plan Office, located on the lower level in SUB II, 703-993-2870.

**Parking Services**

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

Arlington Campus, 104 Original Office Building
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 online at parking.gmu.edu. The Fairfax Campus Sandy Creek Parking Office hours are 8:30 a.m. to 5 p.m. on Monday, Wednesday, Thursday, and Friday, and 8:30 a.m. to 7 p.m. on Tuesday. 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
South Chesapeake Module
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 South Chesapeake Module, 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 online at www.fafsa.ed.gov, or a paper copy can be obtained from the office.

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 online 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 noncitizen 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 glossary section of the home page of financialaid.gmu.edu and in the Office of Student Financial Aid.

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, and Federal Parent Loans for Undergraduate Students (FPLUS). 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](http://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

- **Mary E. Ferguson Emergency Loan Program**: Currently enrolled students may borrow funds for legitimate emergencies, excluding tuition, fees, books, and supplies. Emergency loans must be repaid within 30 days; overdue payments result in a late charge of $5 for each 30 days past due. Failure to repay the loan within 30 days without requesting an extension for a reasonable justification will result in financial suspension. Students financially suspended for nonpayment of an emergency loan are ineligible for any future emergency loans. Application is made through the Office of Student Financial Aid.

- **Doug Beaman Emergency Loan Program**: The George Mason University Alumni Association established an emergency loan fund through which students may borrow up to $100 with repayment due within 30 days. The program is available to all students, with priority given to children of alumni. Application is made through the Office of Student Financial Aid.

- **Lisa Kenaga Memorial Student Emergency Loan Fund**: The Office of Student Financial Aid has established an emergency loan fund through which currently enrolled students may borrow funds for legitimate emergencies, excluding tuition and fees. Emergency loans must be repaid within 30 days with a $10 processing fee; overdue payment results in a late charge of $5 for each 30 days past due. Failure to repay the loan within 30 days without requesting an extension for a reasonable justification results in financial suspension. Students financially suspended for nonpayment of an emergency loan are ineligible for future emergency loans. Application is made through the Office of Student Financial Aid.

### ROTC Scholarships

Please see the Reserve Officer Training Corps section in the Academic Programs and Resources chapter.
Academic Policies

- Undergraduate Policies
  (student classification; academic advising; requirements and categories for good standing and retention; academic suspension and dismissal; academic period and performance)
- Undergraduate Requirements for Programs
  (undergraduate academic program; declaration of major; change of academic program; credit for more than one major; requirements for minors, certificates, bachelor's degrees, second bachelor's degrees; honors)
- Graduate Policies
  (graduate council, faculty and programs; student status; full-time classification; permission to re-enroll; transfer of credit; reduction of credit, academic standards and grades, academic dismissal)
- Graduate Requirements for Programs
  (certificates, master's degrees, doctoral degrees)
- Registration and Attendance
  (academic load, course pre- and co-requisites; repeating a course, advisor's permission; credit to be earned at other institutions; permission to register as a graduate student; graduate course enrollment by undergraduates; special registration; enrolling for credit without grade points/satisfactory, no credit; auditing a course; combined bachelor's and accelerated master's degrees; academic common market; university consortium)
- Academic Calendar
- Grading System
- Graduate Academic Standards, Grades
- Research
- Combined Bachelor's and Accelerated Master's Degrees
- Final Exams
- Degree Application, Conferral and Commencement

Academic Calendar

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

Research

Human Subjects Research

All research activities involving human subjects or data regarding human subjects that are directed by faculty, staff, or students or that involve faculty, staff, or students as participants must be submitted to the Office of Research Subject Protections for review and approval. The form for submission can be found at www.gmu.edu/research/ORSP/HumanSubjects.html. All research activities will be reviewed 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
Registration and Attendance

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 Registrar’s Office 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 the Schedule of Classes and Patriot Web for information about their registration date and time.

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 Procedure

The Schedule of Classes, made available by the Registrar’s Office before priority registration each semester, contains written instructions for registration. Courses listed in the Schedule of Classes 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 Registrar’s Office.

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 course is dropped before the tuition liability begins. See the Schedule of Classes for deadlines.

Changing Registration

Registration changes must be completed within the schedule adjustment period defined below and indicated in the Schedule of Classes. Changes to registration are usually made via Patriot Web.

The last day for adding a 14-week course is two calendar weeks 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 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 date listed in the Schedule of Classes for adding courses, 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 in the Schedule of Classes. **All classes in which a student is enrolled past the drop deadline will remain part of the official academic record.** For more information, see the Additional Grade Notations—Administrative Failure section of this chapter. After the date listed in the Schedule of Classes for dropping courses, 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 from a Semester section of this chapter.

No change of registration transaction is complete until it is processed by the Office of Student Accounts and the Office of the Registrar.

**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 the Schedule of Classes.

**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 following 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. Procedures are published in the Schedule of Classes.

**Course Withdrawal with Dean Approval**

For graduate and nondegree students, withdrawal after the last day for dropping 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 section on Requirements for Retention.

Academic Load

The minimum full-time load for undergraduate students is 12 credits per semester. For graduate full-time load, see the Graduate Policies section below. 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 Registrar’s Office before students can register for more than the maximum allowable credits. The Overload Permission Chart declares maximum credits and approval authority for all categories of students; it is published in the Schedule of Classes each semester.

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 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. Questions should be addressed to the academic department or course instructor.

Repeating a Course

Some courses are annotated in the catalog as “repeatable for credit.” These are courses in which students receive additional credit for more than one taking of the same course, up to a maximum number of credits specified in 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 grade of B- or better are not permitted to repeat the course for credit. Also, they must obtain permission from the offering department to repeat a course in which a grade of C or below has been earned. 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.

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.

Credit to Be Earned at Other Institutions

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
the appropriate Mason 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 Registrar’s Office. 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.

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 the Office of
the Registrar. 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 so 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 below. 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 the Additional Grade Notations section below.

**Auditing a Course**

Auditing a course requires the instructor’s permission. Audit forms are available at the Registrar’s Office. 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.

**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 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, Catholic University of America, Corcoran College of Art and Design, Gallaudet University, George Washington University, Georgetown University, Howard University, Marymount University, Southeastern University, Trinity College, 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 in the Schedule of Classes and on the web at registrar.gmu.edu/students/consortium/index.html. Information pertaining to all member institutions is available at www.consortium.org/main.asp. For more information, call the consortium coordinator in the Office of the Registrar at 703-993-2436.

**Attendance Policies**

Students are expected to attend the class periods of the courses for which they register. 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.

**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 placement 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 above.

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
Final Exams

Final exams are usually given at the end of undergraduate courses. 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.

Absences

Absences from final exams will not be excused except for sickness on the day of the exam or other cause 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 section below 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 credits is a measure of quantity. The grade is a measure of quality. For grades applicable to graduate courses, see the Graduate Academic Standards, Grades section of this chapter.

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

<table>
<thead>
<tr>
<th>Undergraduate</th>
<th>Grade</th>
<th>Points</th>
<th>Courses</th>
</tr>
</thead>
<tbody>
<tr>
<td>A+</td>
<td>4.00</td>
<td>Passing</td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>4.00</td>
<td>Passing</td>
<td></td>
</tr>
<tr>
<td>A-</td>
<td>3.67</td>
<td>Passing</td>
<td></td>
</tr>
<tr>
<td>B+</td>
<td>3.33</td>
<td>Passing</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>3.00</td>
<td>Passing</td>
<td></td>
</tr>
<tr>
<td>B-</td>
<td>2.67</td>
<td>Passing</td>
<td></td>
</tr>
<tr>
<td>C+</td>
<td>2.33</td>
<td>Passing</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>2.00</td>
<td>Passing</td>
<td></td>
</tr>
</tbody>
</table>
No credit toward graduation accrues from a failing grade or a grade that is replaced by a retaken course. For more information, see the Registration and Attendance section of this chapter.

### 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. Students may also elect to take credit without grade. For more information, see the Registration and Attendance section of this chapter.

**A/B/C/NC:** Students who successfully complete English Composition and Introduction to Literature (ENGL 101) or Composition for Non-Native Speakers of English (ENGL 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 Registrar’s Office 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 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 Registrar’s Office 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 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, practica, 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 registrar to an F. IP grades will also be awarded in courses numbered 998 and 999 until successful completion, and then they will be changed to S/NC. Upon successful completion of 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. Official semester grade reports for tuition reimbursement may be obtained through the Office of the Registrar. Students may also order an official transcript through the Registrar’s Office.

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 requesting 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 of this chapter.

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 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 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 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).

**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.

**Degree Application, Conferral and 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 file the intent to graduate is generally six to seven months prior to the conferral date. Specific deadlines are published on the registrar’s web site registrar.gmu.edu. Some graduate programs require a paper application. Applications are available on the registrar’s web site as well as complete instructions and deadlines regarding graduation. 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. Master’s degree students must complete non-course degree requirements including credit-by-exam, oral exams, theses, scholarly papers, and comprehensive exams prior to the conferral (graduation) date. 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 and Attendance 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 another major, a concentration, a minor, or an undergraduate certificate.

- **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 15 graduate credits. Certificates are approved by the school or college at the undergraduate level and by the Graduate Council at the graduate level. The name of a completed certificate program appears on the transcript after the conferral of an undergraduate degree. For each undergraduate certificate, at least 15 credits used to fulfill its requirements cannot be used to fulfill the requirements of a major, a concentration, a minor, or another undergraduate certificate.

- **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.
Bachelor’s degree candidates who have been continuously enrolled (allowing absences from summer terms or single semesters) may choose to graduate under the terms of any catalog in effect at or after their admission. 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.

Master’s and doctoral degree candidates who have been continuously enrolled may choose to graduate under the terms of any catalog in effect at or after their admission. Students who have been inactive more than one year, however, must graduate under a catalog in effect after they have been granted permission to re-enroll, or they must petition their unit dean or director to graduate under an earlier catalog. The final decision rests with the unit dean or director.

**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](http://events.gmu.edu) for current information about all Commencement details including tickets, regalia, and schedules. 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.

**Undergraduate Policies**

**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, 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 may 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 and Attendance section of this chapter.

**Academic Advising Center**

Student Union Building I, Room 304, MS 2E6  
Phone: 703-993-2470  
Fax: 703-993-2478
Admitted students who have not yet declared a major or are considering a change of major are assisted in the Academic Advising 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 preprofessional programs in the health fields. Advising is available by appointment Monday through Friday, 9 a.m. until 5 p.m., and Tuesday until 8 p.m. when classes are in session.

Student Academic Affairs
Johnson Center, Room 245, MS 2C4
Phone: 703-993-9082
Fax: 703-993-9008
Web: www.gmu.edu/departments/saa

Student Academic Affairs is the umbrella unit for the Freshman Center, Transfer Center, and the University Transitions Office and also rules on all academic actions submitted by students not in a declared major.

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 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
Phone: 703-993-9305
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, 209 Science and Technology I, 4400 University Drive, MS 2C4, Fairfax, Virginia 22030.
Requirements for Retention

The following system of academic progress became effective in fall 2004 and applies to all undergraduate degree and nondegree students at Mason, including those formerly categorized as extended studies students.

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.

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.

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</th>
<th>Warning</th>
<th>Probation</th>
<th>Suspension</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attempted</td>
<td>Cumulative GPA Range</td>
<td>Cumulative GPA Range</td>
<td>Cumulative GPA Range</td>
</tr>
<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.

Periods of 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 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.

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 in the first semester of returning to Mason; approval may depend on successful completion of that semester. Approval of the request is neither automatic nor guaranteed.

Undergraduate Requirements for Programs

Undergraduate Academic Program, 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.

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 Change/Declaration of Academic Program Form.

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 Declaration of Second Major section of the Change/Declaration of Academic Program form, available in the Registrar’s Office or at registrar.gmu.edu/forms. 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.

**Minors**

Students may elect minor programs of study in addition to major fields by completing the Declaration or Change of Minor section of the Change/Declaration of Academic Program Form. 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 completing the Change/Declaration of Academic Program Form. 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. 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.

**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 (ENGL 101 and ENGL 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.
- **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 enrolled in the Honors College or New Century College learning communities complete the English composition requirement as specified in those programs. All other students, unless they have received equivalent credit through transfer or proficiency exam, must enroll in ENGL 101 (or 100) upon admission and, after meeting its prerequisites, ENGL 302. Students must attain a minimum grade of C in composition courses to fulfill degree requirements.

**Writing-Intensive Course Requirement**

In addition to English composition and as part of the university’s commitment to literacy in all programs, at least one course in each major has been designated “writing intensive.” While other courses in the major may require written projects, writing-intensive courses emphasize the process of drafting and revision. Faculty members give constructive comments on drafts of at least one course project. Students then revise and resubmit, or use for future submissions. Writing-intensive courses are numbered 300 and above. See the description of each major for the specific courses that fulfill the requirement.

**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. 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.

**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.

**Graduate Policies**

**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 tenured and tenure-track faculty members and other faculty members appointed to the graduate faculty by the provost.

**Academic Programs**

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. For more information, see the Registration and Attendance section of this chapter.

**Student Status**

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 (20 hours a week) and are enrolled in at least 6 graduate credits per semester. Graduate 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. Graduate students who have completed the minimum number of credits required by their degree program, including the minimum number of credits of 998 and 999 required by the university and their degree program, are considered full time if they are registered for at least 1 credit of 999 and their advisors and department chairs certify each semester that they are working full time on the dissertation. Note that different criteria for full-time status may apply for tuition, verification, loan deferral, and financial aid. Contact Student Accounts, the Registrar’s Office, and Student Financial Aid, respectively, for more information.

**Change from Nondegree Status**

A student admitted for graduate study in nondegree status may request a change to degree status within the same program. All admission requirements (as usually 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. The final decision rests with the unit dean or director. Forms are available from the Office of the Registrar at registrar.gmu.edu/forms.
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 Registrar’s Office 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.

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.

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.

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.

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.

Credit from Other Institutions

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 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. Credits earned through the consortium are considered resident, not transfer, credits, and are therefore not subject to transfer of credit conditions or limitations.

Graduate Academic Standards, Grades

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. 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.

**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**

Graduate students who are admitted provisionally may be terminated from their academic programs if they fail to meet the conditions of their admission within the time limits set at admission. Students admitted provisionally and nondegree graduate students may be terminated upon accumulating grades of F in two courses or 9 credits of unsatisfactory grades in graduate courses. Provisionally admitted students who accumulate 12 credits of unsatisfactory grades in undergraduate courses will also be terminated. (For students admitted provisionally, graduate and undergraduate grades are not combined in the calculation of unsatisfactory credits leading toward 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 non-degree students at Mason, for knowing when their grades have met the standard, and for initiating any appeal to their dean. Students may be terminated if they fail to achieve satisfactory progress toward their degree. 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 take courses in other programs through nondegree studies.

**Academic Dismissal**

A degree-seeking graduate student is dismissed after accumulating grades of F in two courses or 9 credits of unsatisfactory grades 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. 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.

**Graduate Requirements for Programs**

**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 15 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 Transfer of Credit 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 or two graduate certificate programs while they pursue a master’s and/or doctoral degree. Students who have completed a graduate certificate may subsequently be approved to apply many of those credit hours to a master’s degree. Courses applying to the master’s or doctoral program may also apply to up to two graduate certificate programs. When such sharing of credits between graduate certificates and graduate degrees has occurred, a maximum of two graduate certificates may be conferred.

Students in Graduate Certificate Programs Only

Admission
Students must be admitted to the graduate 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. 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 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.

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. 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 named by the candidate’s department chair, who designates a member of the graduate faculty from that department as the thesis committee chair. The committee is appointed after consulting with the candidate and advisor and consists of at least three people. Two must be members of the graduate faculty from the candidate’s department, while one may come from outside the department.

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 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.
- **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.
- **Defense.** Candidates must pass a final public defense of the doctoral dissertation.
- **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
Doctoral students have six years from the time of first enrollment as a degree-seeking student to advance to candidacy. Students have five years from the time of advancement to candidacy to graduation. Individual doctoral 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 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 time limits 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.

**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 should have completed all course work required by the program faculty, 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**

By the time a doctoral student is advanced to candidacy, the dean or director of the school, college, or institute appoints a dissertation committee upon recommendation of the program director. 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. The committee consists of a dissertation director, normally a graduate faculty member (see the Graduate Faculty section in this chapter) from the department of the student’s field of study and at least two other members of the graduate faculty, one of whom must be from outside the student’s local academic unit (school, college, institute, or department). Additional members may be appointed who are not members of the graduate faculty or are from outside the university.
Student-initiated changes in the composition of the dissertation committee may occur only with the approval of the dean or director in consultation with the committee. Such changes may be made for extenuating circumstances only. 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.

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](https://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 website, thesis.gmu.edu, provides students with useful tools, including downloadable templates of necessary elements, forms required for the submission process, and links to related websites. 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.
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, and academic policies. This catalog is the normal repository of 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 section of this catalog. 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.

Official Communication with Students

Web: mail.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, Johnson Center, Room 245. 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**

Johnson Center, Room 245  
Phone: 703-993-3006  
E-mail: 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.

**Privacy of Student Records**

Office of the Registrar  
Web: registrar.gmu.edu/privacy/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) to 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 Registrar’s Office web site 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, 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:* 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 Registrar’s Office, Room 1 N. Chesapeake, 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.

Telephone Directory: Prevents the listing of student name, address, telephone number(s), major, and e-mail address in the George Mason University Telephone Directory.

Requests to withhold your information from the campus directory must be submitted to the Registrar’s Office by 5 p.m. on Friday of the first week of classes of the semester to have information withheld in time for the publication of that academic year’s George Mason University Telephone Directory.

Confidential (Private): 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 goals and assessment activities of a specific program, whether curricular or extracurricular, go to assessment.gmu.edu and click on Academic Program Review.

**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 validated each semester after payment is made for classes. For more information, call the Photo ID Office at 703-993-1004, or go to the Photo ID Office section in the General Policies page of this catalog.

**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 mail.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 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 2.30, 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 Academic Policies Section

**Animal Use in Research**

Please see Academic Policies Section

**Student Work, Intellectual Property**
Copyrightable works, including dissertations and patentable works developed in connection with course work by students who are not Mason employees, are deemed to belong to the student. Mason may, however, 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.

**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 Judicial Affairs is administratively responsible for supervising student conduct on campus. Questions regarding student conduct should be directed to Judicial Affairs, SUB I, Room 302, 703-993-2884, judicialaffairs.gmu.edu.

**Student Health Services**

Student Health Services provides high-quality health care to all currently enrolled students. There is no evaluation fee, but there are minimal charges for most tests and procedures. The staff includes physicians, nurse practitioners, registered nurses, a medical technologist, 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, Room 214, 703-993-2831

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

**Arlington Campus:** 3330 Washington Boulevard, Room 150 F and I, 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. 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, with first dose given after first birthday) or a laboratory report of a titer documenting positive immunity is acceptable.
- 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.
- All students living in the residence hall shall be immunized 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 the Virginia Department of Health. TB screening must have been completed in the United States, within the past 12 months. For more information, please visit shs.gmu.edu/immunizations.

The Immunization Record must be submitted by October 1 for fall entrance and March 1 for spring entrance. If the student’s completed immunization records are not submitted by the due date, his or her student account will be placed on hold and he or she could be charged an immunization record late fee. Records can be sent to George Mason University, SUB I, Room 214, 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. For more information visit shs.gmu.edu/immunizations or call 703-993-2836 or 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 or possession of illegal drugs and drug paraphernalia is prohibited on all Mason campuses. 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 University Judicial Code.
• The University Police will enforce all applicable local, state, and federal laws in accord with established standing orders, procedures, and guidelines.
• A university judicial review of all reports of drug offenses will be held. Action under the University Judicial Code 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 by the university’s Office of Alcohol, Drug, and Health Education.
• The housing status of a resident student found responsible for a 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 be issued a trespass order prohibiting their presence in any and all residential buildings on the university’s campuses. This trespass order will be in effect for a minimum of one calendar year. Residential students may be held accountable for the behavior of their guests as it relates to drug regulations.
• The standard sanction for a student’s first violation involving possession or use of marijuana or possession of drug paraphernalia will be suspension from the university for a minimum of one academic semester.
• Any student found responsible for a violation involving the sale or the possession of an illegal substance with intent to distribute will be permanently separated from the university.
• Any student found responsible for use or possession of an illegal drug other than marijuana will be suspended from the university for a minimum of one year. The suspended student must provide evidence of successful participation in 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 Presidents Park, designated first-year residential areas in University Commons, Dominion, Commonwealth, and Chesapeake Halls, and all designated Healthy Living floors.
• Students 21 years of age or older are permitted to possess alcohol in TAP (townhouses and apartments), Chesapeake, Liberty Square, Potomac Heights, and non-first-year areas in University Commons, Dominion, Commonwealth, and Chesapeake Halls. (Residents of legal drinking age may possess and store alcohol in quantities that reasonably can be considered for personal consumption (refer to the Guide to P.R.I.D.E. for further information).

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

• Violations of this policy by students will be adjudicated through the Office of Judicial Affairs and, contingent on police involvement, the General District Court. Violations of this policy by nonstudents will be adjudicated through the General District Court System.

• Sanctions imposed will be designed to offer assistance in overcoming an identified challenge as it relates to a specific incident that involved alcohol consumption. While the purpose of the sanction will be educational and remedial, it may be appropriate to remove the student from campus housing or the university.

• The university will encourage parental involvement whenever there is a repeat offense or the first offense indicates a serious problem. This involvement will be in accord with the provisions of the Family Education Rights and 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, or age. 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 affirmative action 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 D105, 703-993-8730. The Equal Opportunity/Affirmative Action Grievance Procedure lists the various ways to file a complaint. Grievance procedures can be found at [www.gmu.edu/equity/policies_grievance.htm](http://www.gmu.edu/equity/policies_grievance.htm).

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 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, 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 [www.gmu.edu/equity/policies_grievance.htm](http://www.gmu.edu/equity/policies_grievance.htm).
Procedure lists the various ways to file a complaint. Grievance procedures can be found at www.gmu.edu/equity/policies_grievance.htm.

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 D105, 4400 University Drive, MS 2C2, Fairfax, Virginia 22030. Phone: 703-993-8730; TTY: 703-993-8787.

*Note:* 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.

### 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 or 703-993-8787 (TTY). 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 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.

### 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 the Mason Judicial System for Student Conduct, and civil proceedings may occur in certain situations. University sanctions are intended not to punish individuals but to provide education and rehabilitation services.

Sanctions depend on the severity of the violation. They range from written warnings to expulsion from the university. Most sanctions require the student to be evaluated by Substance Abuse Programs and Services personnel, who will assess the severity of alcohol and other drug problems and offer referrals to arrange community service hours. 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, such as the Bistro. For more information, please review the comprehensive guidelines for alcohol service available in the Office of Substance Abuse Programs and Services.

**Campus and Community Resources**

**Fairfax Campus—Health and Wellness Education Resource Room:** SUB I, Room 220, 703-993-3686, and SUB I, Room 219, 703-993-2830

**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 Substance Abuse Programs and Services, Health and Wellness Center, SUB I, Room 219K. 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
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 104 Original Building Office
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. A new parking deck is expected to open in fall 2009 off University Drive. 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 7 a.m. to 10 p.m., Monday through Friday, and 8 a.m. to 8 p.m., Saturday and Sunday. 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, except for the Arlington Campus, 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 5 p.m., Monday, Wednesday, Thursday, and Friday, and 8:30 a.m. to 7 p.m. on Tuesday. 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
- West Campus Shuttle, providing service between Presidents Park and the West Campus Parking Lot on the Fairfax Campus
- Field House Shuttle, providing service Monday through Thursday between the Field House and the CUE Bus Stop on the Fairfax Campus.

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.

**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.

**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.
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 Student Judicial Code.

For more information about the Office of Judicial Affairs and the Student Judicial Code, please call 703-993-2884, go to judicialaffairs.gmu.edu, or visit the Office of Judicial Affairs in SUB I, Room 302. Employees may contact George Mason University Employee Relations at 703-993-2600. To reach University Police, please call 703-993-2810.

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 2008 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 sidewalks, 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.
University Academic Programs and Resources

- University Libraries
- Office of the Ombudsman
- Honors College
- University Scholars Community
- University Courses
- International Programs and Resources
- Office of Continuing Professional Education
- New Professional Studies, MA/MS
- Army ROTC
- Oak Ridge Associated Universities (ORAU)
- Center for Global Studies
- The Center for Real Estate
- 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

Craig Gibson, Associate University Librarian for Research, Instructional, and Outreach 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

Fisher, Matthews, Perry, Stockwell, Vay

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 1.2 million books and bound journal volumes; 11,000 current print serial subscriptions; 3.0 million microform units; 341,000 print government documents; 214,000 maps; 36,000 multimedia materials; 550 electronic databases; 31,000 electronic journals and proceedings; 100,000 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.

The library liaison program supports a variety of cooperative and collaborative activities. Liaison librarians work with academic departments and programs to develop print collections and electronic resources. They also offer introductory and advanced information literacy instruction sessions, as well as advanced reference and research consultation services to students and faculty. Each of the four libraries has its own dedicated instruction room for information literacy classes.

Through membership and active participation in local, regional, and national library consortia, the University Libraries are better able to meet the needs of the university’s growing and diverse academic and research programs. 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 also includes American, Catholic, Georgetown, and George Washington universities
- 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
- 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:

**Educational Services Unit**

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 enables users to ask reference questions via an instant messenger.

**Mason Archival Repository Service**
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.

University Copyright Assistance 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, and course readers. 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.

Records Management

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.

Statistical Research Services

Phone: 703-993-3417
Web: library.gmu.edu/srs

This office provides expert consultation services for students and faculty who need assistance with statistics-based research projects, including quantitative and qualitative research design analysis, and help with the myriad statistical-analysis software.

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. A collection of international newspapers rounds out the collections and services. The Johnson Center has a wireless network that students may use anywhere in the building. Assistive technologies include screen-reading software, text-enlargement software, and special hardware for individuals with disabilities.

**Arlington Campus Library**

Phone: 703-993-8818

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, and conflict resolution. 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, and 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 science; health, fitness, and recreation resources; and administration of justice. 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 (Arlington Campus)**

Phone: 703-993-8106

Administration

Deborah M. Keene, Associate Dean, Library and Technology
This library supports the School of Law and has holdings in law and economics, including specialized academic tracks in intellectual property, litigation, corporate and securities law, international business, regulatory law, and technology and law. The library also provides access to electronic law resources including Lexis, Westlaw, and LegalTrac. This library is open to all members of the university community, and its collections are available for checkout by all faculty, students, and staff.

Office of the Ombudsman

Johnson Center, Room 245
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 special lectures, events, and field trips on and off campus, including distinctive opportunities to take advantage of internships and cultural programs in Washington, D.C. Students in the Honors College have the option of living in a diverse living-learning community.

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

From among the candidates invited to be a part of the Honors College, a small cadre of the most outstanding students are selected as University Scholars. Students selected for this recognition are awarded the university's most competitive and distinguished four-year merit scholarship. 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.

International Programs and Resources

Mason Worldwide (International Degrees)
Web: www.gmu.edu/global

The following academic programs have a strong focus on global issues and subjects:

- BA and MA in anthropology (Department of Sociology and Anthropology)
- BA in communication, with a concentration in international and intercultural communication (Department of Communication)
- BA, BS, MA, PhD in conflict analysis and resolution (Institute for Conflict Analysis and Resolution)
- BA, BS in geography (Department of Geography)
- BA in global affairs
- BA in government and international politics, with a concentration in international and comparative politics (Department of Public and International Affairs)
- BA in Latin American studies (Department of History and Art History)
- BA in Russian studies (Modern and Classical Languages)
- BA in foreign languages, with concentrations in French and Spanish (Department of Modern and Classical Languages)
- MEd in curriculum and instruction, with concentrations in multilingual and multicultural education, foreign language education, and teaching of English as a second language
- MA in foreign languages, with concentrations in French or Spanish, or in Spanish and bilingual-multicultural education (Department of Modern and Classical Languages)
- MS in global health (College of Health and Human Services)
- MS in health science, concentration in international health (College of Health and Human Services)
- MA in history, with concentrations in comparative world history and modern European history (Department of History and Art History)
- MA in international commerce and policy (School of Public Policy)
- MA in political science, with specialization in international politics and comparative government
- MS in professional studies: peace operations
- MPA with a concentration in international management
- MA in telecommunications with a concentration in international telecommunications
- Interdisciplinary minors in African and African American Studies, ancient Mediterranean art and archeology, Asia-Pacific studies, global systems, Islamic studies, Japanese studies, Judaic studies, Latin American studies, linguistics, Middle East studies, the New Europe
- Minors in Chinese, conflict analysis and resolution, French, German, global affairs, international and comparative studies, Latin, Russian, and Spanish
- Undergraduate certificate in Islamic studies and teaching of English as a second language
- Graduate certificates in global trade management; international business planning; international e-commerce and telecommunications policy; international governance and institutions; international health; international health care; international market analysis; managing international commerce; science, technology, and the global economy; teaching of English as a second language; world religions, diplomacy, and conflict resolution

**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@gmue.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**

Krug Hall, Room 202  
Phone: 703-993-3660  
Fax: 703-993-3664  
E-mail: ELI@gmue.edu  
Web: eli.gmu.edu

**Administration**

John Pope, MA, Director  
Baotran Nguyen, MA, 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**
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**
Krug Hall, Room 211
Phone: 703-993-2109
Web: ocpe.gmu.edu

**Prince William Campus Professional Development Office**
Phone: 703-993-8335

**Herndon Office and Training Center Center for Innovative Technology**
2214 Rock Hill Road
Herndon, VA 22070
Phone: 703-993-4800

**Administration**

Janet Niblock, Executive Director

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 Krug 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 Krug 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 professional 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 Washington, D.C.

New Professional Studies, MA/MS

The Master of New Professional Studies Program was established in 1996 to provide graduate education for working professionals. The highlights of this innovative, interdisciplinary degree are as follows:

- Course activities are designed to adapt to the demands of working professionals with a variety of obligations. Through innovative use of information technologies and flexible course scheduling, participants are able to balance the demands of work with an intensive learning experience.
- The degree incorporates action-oriented group learning as a way to integrate theory and practice. Grouped into teams, candidates are immersed in the practical problems of organizations and, at the same time, engage each other through collaborative technologies. By dealing with practical organizational issues, participants gain deeper insight into how complex organizations work.
- The program produces a tightly integrated learning experience and focuses on building a learning community. Participants work on projects as teams and gain an understanding of how to develop team-based organizations.
- Collaborative technology skills developed early on are used throughout the degree program. They enable a high degree of collaboration and interaction between students.

New Professional Studies is an umbrella degree program with four tracks: knowledge management, organization development and knowledge management, peace operations, and teaching. Four core courses (12 credits) are common to all tracks: MNPS 700 The New Professionalism: Theory and Practice; MNPS 702 The New Professional as Reflective Practitioner; MNPS 703 Technology and Learning in the New Professions; and MNPS 704 Research Methodologies in the New Professions. The remaining elective courses (21 credits) are selected from participating disciplines. For information about the tracks on knowledge management, organization development and knowledge management, and peace operations, see the School of Public Policy chapter of this catalog. For information about the teaching track, see the Graduate School of Education section in the College of Education and Human Development chapter.

Army ROTC

Phone: 703-993-2706
Fax: 703-993-2708

Administration
Lieutenant Colonel Sean Barnes, U.S. Army  
Professor of Military Science

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 and assessment, 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, West Virginia, and the District of Columbia.

Enrollment

Enrollment in military science (MLSC) courses is open to all students. Freshmen (MLSC 101 and 102), sophomore (MLSC 201 and 202), and junior (MLSC 301 and 302) classes are awarded 1 credit each. Senior classes (MLSC 401 and 402) earn 3 credits each. Credit earned in military science courses may count toward degree completion as elective credit. No military service obligation is incurred by enrolling in the lower-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 commission credit for ROTC.

Contracted cadets of any level are required to pass an Army Physical Fitness Test (APFT) twice each academic year. Physical training is conducted three times each week (Monday/Wednesday/Friday from 7 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 101, 102, 201, 202), usually taken in the freshman and sophomore years. Each class awards 1 academic credit. The basic course trains students in the topics listed above, as well as in applied topics, including map reading, land navigation, first aid, physical fitness, leadership, ethics and communication skills. Each lecture class meets once a week for 75 minutes. 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. MLSC LAB 201 Leadership Laboratory 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 LAB 201 enrollment in certain circumstances, such as scheduling conflicts.

All LAB 201 sections meet as a combined unit on Thursdays from 1:30 to 4 p.m. During this time, the unit trains 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 rappelling, orienteering, and helicopter orientations. A battlefield visit is offered every year, and a formal military ball is held during the spring semester. The unit has an organized color guard and an intercollegiate Ranger Challenge competition team. Students also have the opportunity to attend official Army training courses such as basic airborne training, the air assault course, and the mountain warfare 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 301, 302, 401, 402) taken during the junior and senior years. MLSC 301 and 302 earn 1 credit each, while MLSC 401 and 402 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. Most graduates elect to serve on active duty although ROTC also offers guarantees of entering either the Army Reserve or Army National Guard to students so inclined.

The 300-level courses emphasize squad and platoon leadership, tactics, and preparation for the Leadership Development Assessment Course (LDAC). LDAC is a five-week training and evaluation event conducted 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 300-level survey course on the American military experience that satisfies this requirement. Permission of the Chair, department 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 lower division students assimilate into the program and helps students prioritize their time to ensure they remain in good academic standing.

Enrollment in the two lower-level ROTC courses 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 to officer phase. 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 LAB 201.

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 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 attend a five-week Leaders Training Camp (LTC) between the sophomore and junior years to gain experience equivalent to the basic course.
- A special four-semester program is available to nursing majors in which LTC is not required.

Education delays for graduate study also may be approved for cadets seeking training as physicians, lawyers or ministers. 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 31 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. Students do not have to be enrolled to apply, and there is no service obligation incurred when applying.
A two-year Guaranteed Reserve Forces Duty scholarship is available that guarantees reserve duty upon graduation and commissioning (no active duty tour). 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 non scholarship cadets. A non scholarship cadet cannot enter into a contract to receive a commission until the sophomore year. For the sophomore, junior, and senior years, non scholarship contracted students receive a monthly stipend and book allowance for the school year.

Air Force ROTC

Two programs are available 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, students should call 301-314-3242 or go to www.afrotc.umd.edu. Mason students can register for the appropriate courses through the Consortium Office, but mandatory courses are held at the University of Maryland. Car pools among Mason students are usually available.

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 pursing 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.

Center for Global Studies

Phone: 703-993-9430
Web: cgs.gmu.edu

Administration
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 and paper 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 Center for Real Estate Entrepreneurship

Phone: 703-993-9843
Web: realestate.gmu.edu

Administration

Greg Hero, Executive Director and Professor

Pooling resources and expertise from the Volgenau School of Information Technology and Engineering, the School of Public Policy, and the School of Management, the Center for Real Estate Entrepreneurship is developing undergraduate, graduate, and certificate programs in real estate development that encompass the entire real estate development continuum from land use and environmental considerations to acquisition dynamics and construction management. Areas of emphasis currently being designed include land use and zoning, sustainable development, real estate finance, management of the development process, development company management, marketing and asset management, and entrepreneurship and leadership.

The Research Office

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

Rick Davis, Associate Provost for Undergraduate Education
Office of the Provost
Phone: 703-993-8722
Web: http://provost.gmu.edu/gened/index.html

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 George Mason University, 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; 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
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 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 (IT) goal: Students develop a command of basic software and hardware concepts, terminology and functions, and file and data structures. They also use appropriate electronic tools for data organization and search, including databases, web browsers, and search engines; data analysis, including spreadsheets, geographic information systems, and statistical software; and data presentation and communication, including text, electronic slides, web pages, graphs, presentation software, HTML, word processing, and e-mail.

Ethics component: Students are required to have classroom experience in, knowledge of, and appreciation for fundamental ethical issues relating to IT and our changing world. These issues include computer security, privacy laws, public policy issues and professional codes of ethics, intellectual property issues, copyright, security, and financial data.

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 the 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 provide an understanding of natural science by addressing the critical approach of the scientific method, relation of theory and experiment, use of quantitative and qualitative information, and development and elaboration of major ideas in science.

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 examine some of the principal global issues and concerns that shape our world today. After completing a course from this category, students will be able to identify the causes and consequences of change in significant global issues. While some courses may focus on a specific issue, others may focus on a specific area or region outside the contemporary Western world by incorporating specific comparisons of several cultures. These courses stress the interconnectedness, difference, and diversity that are central to understanding and operating in a global society.

Required: One approved course.

**Social and behavioral sciences goal:** Courses provide students with an understanding of the social and behavioral sciences, including the development of major ideas in social science. Students engage in reasoning using the scientific method, the use of quantitative and qualitative information, and the analysis of empirical observations in relation to theory, among other methods.

Required: One approved course.

**Synthesis Requirement**

**Synthesis goal:** Synthesis courses draw on skills and knowledge attained through the foundation and core elements of the General Education Program, applying the power of liberal learning to a specific field or fields. Some synthesis courses link particular issues in a given field to wider intellectual and community concerns; others are interdisciplinary. Some synthesis courses also serve as capstone courses in a major. All synthesis courses require students to demonstrate advanced skills in oral and written presentations. All students will take one upper-division synthesis course, typically after all other university general education requirements are met (or concurrently enrolled).

Required: One approved course.
Writing-Intensive Course Requirement

As an integral part of the university’s commitment to literacy in all programs, all students must complete at least one course designated as writing intensive, and at least one course in each major is designed to meet this requirement. For more information, go to the Academic Policies chapter of this catalog. Please read the description of each major for the specific courses that fulfill this requirement.

Approved Courses

The course list reflects approved courses as of press time. For the most current list, go to provost.gmu.edu/gened/approvedcourselisting.html.

Foundation Requirements

Written communication (6 credits: 3 lower, 3 upper)

- ENGL 100 - Composition for Non-native Speakers of English Credits: 4
  or
- ENGL 101 - Composition Credits: 3
- ENGL 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 (IT, all)

- ADJ 300 - Research Methods and Analysis Credits: 4
- ANTH 395 - Work, Technology, and Society: An IT Perspective Credits: 3
- CHEM 350 - Computer Techniques for Chemistry Credits: 3
- ENGR 117 - Information Technology for Engineering Credits: 3
- GOVT 300 - Research Methods and Analysis Credits: 4
- IT 103 - Introduction to Computing Credits: 3
- MUSI 415 - Music in Computer Technology Credits: 3

Information technology (IT, all except ethics)

- AVT 180 - Computers 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 (IT, Ethics)

• CS 105 - Computer Ethics and Society Credits: 1
• ENGR 107 - Introduction to Engineering Credits: 2
• ENGR 401 - Professional Practice and Management in Engineering Credits: 1
• 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 and Statistics 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
• ENGL 201 - Reading and Writing about Texts 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 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 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 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 - Photography I 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: Pre-Twentieth Century Credits: 3
• DANC 391 - Dance History: Twentieth Century Credits: 3
• ENGL 332 - Introduction to Film 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
• 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

**Western civilization/world history (3 credits)**

• HIST 100 - History of Western Civilization Credits: 3
  or
• HIST 125 - Introduction to World History Credits: 3

**Social and behavioral science (3 credits)**

• ADJ 100 - Introduction to Criminal Justice Credits: 3
• AFAM 200 - Introduction to African American Studies Credits: 3
• ANTH 114 - Introduction to Cultural Anthropology Credits: 3
• ANTH 120 - Introduction to Archaeology 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
Global understanding (3 credits)

- ADJ 405 - Law and Justice around the World 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 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 331 - Refugees Credits: 3
- ANTH 332 - Cultures in Comparative Perspective Credits: 3
- ANTH 333 - Humanitarian Action Credits: 3
- ANTH 385 - Gender, Class, and Ethnicity in Latin America Credits: 3
- ARTH 203 - Survey of Asian Art Credits: 3
- ARTH 204 - Survey of Latin American Art 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
- DANC 118 - World Dance Credits: 3
- DANC 318 - Global Perspectives: World Dance Forms 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 380 - Economies in Transition Credits: 3
- ECON 390 - International Economics Credits: 3
- ENGL 349 - Global Voices Credits: 3
- ENGL 350 - The Idea of a World Literature Credits: 3
- GCH 205 - International Health Credits: 3
- GEOG 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 Civilization Credits: 3
- HIST 262 - Survey of African Civilization 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 286 - 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 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 459 - Pre-Modern South Asia Credits: 3
- HIST 460 - Modern Iran Credits: 3
- HIST 462 - Women in Islamic Society 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
- PSYC 379 - Applied Cross-Cultural Psychology Credits: 3
- RELI 100 - The Human Religious Experience Credits: 3
- RELI 211 - Religions of the Near (Middle) East Credits: 3
- RELI 212 - Religions of the Orient Credits: 3
- RELI 313 - Hindu Religion and Philosophy Credits: 3
- RELI 315 - The Buddhist Tradition 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 - Sociology of Urban Communities Credits: 3
- SPAN 322 - Introduction to Latin American Culture 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 - Weather, Climate, and Society Credits: 3
- EVPP 201 - Environment and You: Issues for the Twenty-First Century Credits: 3
- GEOG 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
- 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
- BIOL 103 - Introductory Biology I Credits: 4
- BIOL 104 - Introductory Biology II Credits: 4
- BIOL 213 - Cell Structure and Function Credits: 4
- BIOL 303 - Animal Biology Credits: 4
- BIOL 304 - Plant Biology 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
- EOS 121 - Dynamic Atmosphere and Hydrosphere Credits: 4
- 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
• PHYS 103 - Physics and Everyday Phenomena I Credits: 4
• PHYS 104 - Physics and Everyday Phenomena II Credits: 4
• 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

• ADJ 303 - Experiencing the Criminal Justice System Credits: 3
• ANTH 400 - Engaging the World: Anthropological Perspectives Credits: 3
• ARTH 394 - The Museum Credits: 3
• 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
• CHSS 313 - Mystery, Madness, and Murder 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
• 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
• ENGL 325 - Dimensions of Writing and Literature Credits: 6
• EOS 304 - Population Dimensions of Global Change Credits: 3
• EVPP 335 - People, Plants, and Culture Credits: 3
• FRLN 385 - Multilingualism, Identity, and Power Credits: 3
• GEOG 303 - Conservation of Resources and Environment Credits: 3
• GEOG 304 - Geography of Population Credits: 3
• GEOL 420 - Earth Science and Policy Credits: 3
• GOVT 490 - Synthesis Seminar Credits: 3
• GOVT 491 - Honors Seminar Credits: 3
• HHS 465 - Examination and Integration of Professional and Health Care 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
• PHIL 309 - Bioethics Credits: 3
• PHIL 343 - Issues in Environmental Ethics Credits: 3
• PHIL 377 - Darwin: Biology and Beyond Credits: 3
• PHIL 378 - Reason, Science and Faith in the Modern Age 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 in the Social Environment I 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 342 - The George Mason Debates in Current Affairs Credits: 3
• UNIV 442 - Krasnow Seminar Credits: 3

Total: 40 credits
Colleges, Schools, Institutes and Departments

George Mason University

Institute for Conflict Analysis and Resolution

Phone: 703-993-1300  
Web: icar.gmu.edu  
College Code: CA

Administration

Andrea Bartoli, Director  
Julie Shedd, Associate Director for Administration  
Sandra Cheldelin, PHD Program Coordinator  
Mark Goodale, MS Program Coordinator  
Mara Schoeny, Graduate Certificate Program Director  
Agnieszka Paczynska, Undergraduate Program Director

Faculty

Professors: Avruch, Cheldelin, Gopin, Jeong, Rothbart, Rubenstein, Sandole

Associate professors: Bartoli, Cobb, Hirsch, Lyons, Paczynska, Warfield

Assistant professors: Goodale, Maulden, Nan, Schoeny, Simmons

Research professors: Korostelina, Price, Sluzki

Affiliate faculty: Dale, Dukes

Emeritus faculty: Mitchell

Course Work

The Institute for Conflict Analysis and Resolution (ICAR) 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: icarinfo@gmu.edu  
Location: Arlington Campus

Sandra Cheldelin, PHD Program Coordinator

Mark Goodale, MS Program Coordinator

The Ph.D. 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 M.S. 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 ICAR. 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 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.

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.

College of Education and Human Development

Phone: 703-993-2010  
Web site: cehd.gmu.edu  
College Code: E1

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

Gary Galluzzo, Dean  
Martin Ford, Senior Associate Dean  
Peter Barcher, Associate Dean for Research  
Joan Isenberg, Associate Dean for Outreach and Program Development  
Ellen Rodgers, Associate Dean for Teaching and Academic Affairs  
David Wiggins, Director of the School of Recreation, Health, and Tourism

Undergraduate Degrees, Minors, and Certificates

CEHD offers four undergraduate degrees, 13 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 Physics and Astronomy) and the College of Visual and Performing Arts (Departments of Dance and Music) to provide six collaborative undergraduate degree concentrations or emphases in Biology Education, Chemistry Education, Earth Science Education, Mathematics Education Music Education, and Physics 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.

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. 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 program and other administrative units.

Graduate Degrees and Certificates

CEHD offers one doctoral degree, seven master's degrees, and 31 graduate certificates. The requirements for each degree and certificate are described on their respective catalog pages. 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. 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 Office of Academic and Student Affairs (Robinson Hall, Suite 307; 703-993-2080; cehdoasa@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 School Director for courses taken within the School of Recreation, Health, and Tourism (RHT), and to the Program Coordinator for courses taken within the Graduate School of Education (GSE). The decision may be further appealed to the Associate Dean for Teaching 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.

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 (Robinson Hall, Room 103; 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, EDAE, EDAL, EDCD, EDCl, EDEP, EDIT, EDLE, EDRD, EDRS, EDSE, EDUC, EDUT, EFHP, HEAL, IETT, PHED, PRLS, SPMT, 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 one master's degree, four undergraduate degrees, six minors, and one undergraduate certificate. The MS in Exercise Science, Fitness, and Health Promotion prepares professionals to more adequately serve their communities or pursue advanced 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: R. Baker, Banville, Bever, Daniels, Dieke, Kozlowski, Miller, Rikard, P. Rodgers, Schack, B. Wiggins

Assistant professors: Allen, Ambegaonkar, Caswell, Esherick, Harmon, Lee, Park, Shelby, Winchester

Instructors: Norden, Parham

Course Work

RHT offers course work designated ATEP, EFHP, HEAL, PHED, PRLS, SPMT, and TOUR in the Courses chapter of this catalog. Additional courses are offered for elective credit to George Mason University students. These courses are included under PHED and PRLS.
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 two 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.

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.

Complementary Certificate Programs

Students may also complete a complementary graduate certificate outside of RHT in the following areas:

Environmental Management Undergraduate Certificate (SC-CERB-EVMG)

For details on this 27-credit undergraduate certificate, 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.

Gerontology Undergraduate Certificate (HH-CERB-GERO)

For details on this 24-credit undergraduate certificate, see the College of Health and Human Services chapter of this catalog.

Note: Students interested in the Certificate in Gerontology should take BIOL 124 and BIOL 125.

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.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
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<tbody>
<tr>
<td>PHED 102</td>
<td>Introduction to Soccer</td>
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<tr>
<td>PHED 103</td>
<td>Aerobics and Basic Conditioning</td>
<td>3</td>
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<tr>
<td>PHED 105</td>
<td>Social Dance</td>
<td>1</td>
</tr>
<tr>
<td>PHED 107</td>
<td>Weight Training and Body Conditioning</td>
<td>1</td>
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<td>PHED 110</td>
<td>Beginning Swimming</td>
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<tr>
<td>PHED 113</td>
<td>Latin Dance</td>
<td>1</td>
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<tr>
<td>PHED 116</td>
<td>Advanced Life Guarding</td>
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<td>PHED 118</td>
<td>Social Dance II</td>
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<td>PHED 127</td>
<td>Fencing II</td>
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<td>PHED 129</td>
<td>Introduction to Yoga</td>
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<td>PHED 130</td>
<td>Self-Defense for Men and Women</td>
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<td>PHED 135</td>
<td>Self-Defense for Men and Women II</td>
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<td>PHED 136</td>
<td>Tae Kwon Do</td>
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<td>PHED 137</td>
<td>Intermediate Tae Kwon Do</td>
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<td>PHED 138</td>
<td>Brazilian Jiu-Jitsu</td>
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<td>PHED 139</td>
<td>Brazilian Jiu-Jitsu II for Men and Women</td>
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<td>PHED 140</td>
<td>Golf</td>
<td>1</td>
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<tr>
<td>PHED 141</td>
<td>Intermediate Golf</td>
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<tr>
<td>PHED 145</td>
<td>Beginning Judo for Men and Women</td>
<td>1</td>
</tr>
<tr>
<td>PHED 146</td>
<td>Introduction to Badminton</td>
<td>1</td>
</tr>
<tr>
<td>PHED 147</td>
<td>Advanced Tae Kwon Do</td>
<td>2</td>
</tr>
<tr>
<td>PHED 149</td>
<td>Tai Chi</td>
<td>1</td>
</tr>
<tr>
<td>PHED 150</td>
<td>Intermediate Swimming</td>
<td>1</td>
</tr>
<tr>
<td>PHED 151</td>
<td>Introduction to Tennis</td>
<td>1</td>
</tr>
<tr>
<td>PHED 153</td>
<td>Intermediate Tennis</td>
<td>1</td>
</tr>
<tr>
<td>PHED 155</td>
<td>Introduction to Springboard Diving</td>
<td>2</td>
</tr>
<tr>
<td>PHED 156</td>
<td>Intermediate Springboard Diving</td>
<td>2</td>
</tr>
<tr>
<td>PHED 157</td>
<td>Aikido for Men and Women</td>
<td>1</td>
</tr>
<tr>
<td>PHED 158</td>
<td>Underwater Hockey</td>
<td>1</td>
</tr>
<tr>
<td>PHED 159</td>
<td>Advanced Swimming</td>
<td>1</td>
</tr>
<tr>
<td>PHED 160</td>
<td>Intermediate Tai Chi</td>
<td>1</td>
</tr>
<tr>
<td>PHED 162</td>
<td>Introduction to Bowling</td>
<td>1</td>
</tr>
<tr>
<td>PHED 163</td>
<td>Karate</td>
<td>1</td>
</tr>
<tr>
<td>PHED 164</td>
<td>Intermediate Karate</td>
<td>1</td>
</tr>
<tr>
<td>PHED 165</td>
<td>Introduction to Racquetball</td>
<td>1</td>
</tr>
<tr>
<td>PHED 166</td>
<td>Intermediate Racquetball</td>
<td>1</td>
</tr>
<tr>
<td>PHED 167</td>
<td>Advanced Concepts and Strategies in Bowling</td>
<td>1</td>
</tr>
<tr>
<td>PHED 168</td>
<td>Introduction to Basketball</td>
<td>1</td>
</tr>
<tr>
<td>PHED 169</td>
<td>Intermediate Judo for Men/Women</td>
<td>2</td>
</tr>
<tr>
<td>PHED 250</td>
<td>Water Safety Instruction</td>
<td>2</td>
</tr>
<tr>
<td>PHED 255</td>
<td>Basic Scuba Diving</td>
<td>2</td>
</tr>
<tr>
<td>PRLS 110</td>
<td>Exploring Outdoor Adventure</td>
<td>2</td>
</tr>
<tr>
<td>PRLS 115</td>
<td>Introduction to Fly Fishing</td>
<td>1</td>
</tr>
<tr>
<td>PRLS 117</td>
<td>Rock Climbing</td>
<td>2</td>
</tr>
<tr>
<td>PRLS 118</td>
<td>Intermediate Rock Climbing</td>
<td>2</td>
</tr>
<tr>
<td>PRLS 119</td>
<td>Trap and Skeet Shooting</td>
<td>2</td>
</tr>
<tr>
<td>PRLS 120</td>
<td>Introduction to Backpacking</td>
<td>2</td>
</tr>
<tr>
<td>PRLS 121</td>
<td>Intermediate Trap and Skeet Shooting</td>
<td>2</td>
</tr>
</tbody>
</table>
PRLS 122 - Introduction to Horsemanship Credits: 1
PRLS 123 - Intermediate Rock Climbing Credits: 1
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 and Cross-Country 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

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, seven minors, and 31 graduate certificates. Within each of these degree programs students have the option to choose a concentration or emphasis that best meets their interests or needs. Additionally, students may pursue course work leading to initial teacher licensure.

Faculty


Associate professors: Bannan-Ritland, Bauer, Bon, Brazer, Brigham, Burns, Castle, Clark, Dabbagh, DeMulder, Duck, Falconer, Fox, Grant, Kaffenberger, Kidd, Kitsantas, Ndura, Osterling, Pierce, Razeghi, Reybold, Samaras, Sanchez, Sprague, Talleyrand, Thomas, Thorp, Upperman, Werner, Wong, Zenkov

Assistant professors: P. Baker, Buehl, Cozart, Day, Frazier, Hanley, Hardy, Hjalmarson, Hruby, Jerome, Kalbfleisch, Malloy, Nasser, Parsons, Peters, Regan, Sheridan, Shockley, Suh, Swanson, Taboada, View, N. Williams, Williams van Rooij

Instructors: Hathaway, Rioux-Bailey

Course Work

GSE offers course work designated EDCD, EDCI, EDEP, EDIT, EDLE, EDRD, EDRS, EDSE, EDUC, and EDUT 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. Six 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 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.

**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 Department of Molecular and Microbiology (MMB) 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 Department of Physics and Astronomy section in the College of Science chapter of this catalog.

**Peace Corps Fellows and Master's International Programs (MIP)**

The FAST TRAIN (The Foreign Affairs' Spouses Teacher Training) Program is an approved site for the Peace Corps 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 Peace Corps 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.

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
- School of Nursing
- Social Work

The mission of the College of Health and Human Services (CHHS) is to equip professionals to provide leadership, care, and services related to health promotion, wellness, disease prevention, and quality of life through the promotion of physical, social, and environmental health practices. Graduates practice in a variety of roles in settings that are complex, multicultural, and dynamic. The college is a resource for health promotion to the university, as well as to citizens of Virginia.

The State Council of Higher Education for Virginia and the State Board of Nursing approved the baccalaureate nursing program in 1974. Since then, the program has grown from a department of nursing to a school of nursing. In 1993, the school was reorganized into the College of Nursing and Health Science, and in 2006, into the College of Health and Human Services to provide the breadth needed to respond to dramatic and dynamic fundamental changes occurring in health care and social work. The expanded, multidisciplinary CHHS 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.

Administration

Shirley Travis, Dean
Keith Howell, Associate Dean, Research and Program Evaluation
J. Goodlett McDaniel, Associate Dean, Practice, Marketing, and Finance
Robin Remsburg, Associate Dean and Director, School of Nursing
Frank J. Whittington, Associate Dean, Academic Affairs
Susan J. Swett, Assistant Dean, Student Affairs
P. J. Maddox, Chair, Health Administration and Policy
Lisa Pawloski, Chair, Global and Community Health
Miriam Raskin, Acting Chair, Social Work

Faculty

Faculty emeriti: Ailinger, Boyd, Brenkus, Carty, Jenkins, Johnson-Brown, Langley, Parker-Smith, Redmond, Silva, Vail, Walker

Professors: Butler, Gaffney, Gerber, Hadley, Howell, Maddox, Meiners, Metcalf, Moore, Raskin, Remsburg, Ritchie, Rose, Sluzki, Sorrell, Travis, Whittington

Associate professors: Baghi, Cangelosi, Chong, Cuellar, Davidson, Davis, Douglas, Eckenwiler, Harris Rome, Keyser, Mahon, McDaniel, Moidu, Normile, Panniers, Pawloski, Ternus, Vakalahi, Wolf-Branigin, Wu
**Assistant professors:** Boland, Carle, Cartwright, Cleaveland, Gewa, Hahn, Ihara, Jacobsen, Kitsantas, Kodadek, Maradiegue, Miklancie, Moss, Oh, Perlin, Roberts, Rudowski, Smoczynski, Tompkins, Urban, Webster, Weinstein, Willis, Winter, Wojtusiak, Yang, Young, Zhou

**Instructors:** Almond, Blasser, Campo, Clark, Cox, Davis, Dickman, Durham, Freeborne, Gaston, Gillette, Henderson, Liss, Middle, Mulqueen, Shiver, Stoehr, Toulouse, Venske, Welsh

## Course Work

CHHS offers all course work designated GCH, HAP, HHS, NURS, and SOCW in the Courses chapter of this catalog.

## Academic Programs

The College of Health and Human Services is dedicated 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 the Commonwealth of Virginia, and these graduates have one of the state’s highest pass-rates on the nursing licensure exam. Through the PhD program in nursing, CHHS is helping fill the need for nursing faculty and researchers. The College’s Department of Health Administration and Policy prepares students for careers as leaders and managers of health care organizations and as health policy-makers at both 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 both local and international populations. The Department of Social Work educates both undergraduate and graduate students to be professional social workers able to work in either community organization or clinical settings. These academic units offer a variety of specializations within degree programs, including nutrition, gerontology, rehabilitation science, 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, 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 provides support to students, faculty and staff on a variety of admissions, academic, and policy issues. The office is involved with recruiting new students; pre-admission advising; processing applications for graduate programs and Nursing BSN programs (junior-level admission to the BSN pathways, and the accelerated second-degree BSN); and conducting orientations for newly-admitted students.

Student Affairs maintains the college’s student records; reviews and recommends action on undergraduate and graduate 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, described in the Academic Policies section of the catalog.

Each student is assigned an academic advisor with whom he or she should meet at least once a semester to insure program graduation requirements are met. The assigned advisor may be a faculty member, a departmental advisor, or an advisor in the Office of Student Affairs.

## Student Responsibility
Students are required to have an active Mason e-mail account, and to update any change of address on-line through Patriotweb. The college will not use personal (non-GMU) e-mail addresses to communicate with students. Students are responsible for knowing the university academic policies and the policies governing their program as stated in the university catalog, and should regularly monitor their Mason transcript on-line and their degree progression through the degree evaluation tool on Patriotweb [link to https://patriotweb.gmu.edu/].

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 placed in 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 regulations established by the Commonwealth of Virginia and the agencies to which students are assigned and to minimize risks to student health, every student enrolled in a CHHS program requiring clinical or practicum coursework must document and submit evidence of good health and provide current immunization records to both the CHHS Office of Student Affairs and 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.

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. 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 also considered agents of the university. They are covered 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: 703-993-1926 (Undergraduate programs)
Phone: 703-993-1947 (Master's programs)
Phone: 703-993-1961 (Doctoral program)
Web: nursing.gmu.edu

Faculty

Emeriti: Ailinger, Boyd, Brenkus, Carty, Jenkins, Johnson-Brown, Langley, Paker-Smith, Redmond, Silva, Vail, Walker

Professors: Gaffney (assistant dean, doctoral studies), Milligan, Moore (assistant dean, nursing research), Remsburg (associate dean/director), Sorrell, Travis (dean)

Associate Professors: Cangelosi, Chong, Davidson, Douglas, Mahon, McDaniel (associate dean, business development), Normile, Panniers, Ternus (academic outreach director), Wu

Assistant Professors: Boland, Hahn (assistant dean, masters/post masters division), Kodadek, Maradiegue, Miklanci, Moss, Oh, Roberts, Smoczynski, Urban (assistant dean, undergraduate division), Willis, Young, Zho

Instructors: Almond, Blasser, Campo, Cox, Davis, Dickman, Durham, Liss, Middle, Mulqueen, Stoehr, Toulouse, Venzke, Welsh

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.

Global and Community Health

Phone: 703-993-3126
web: chhs.gmu.edu/gch/

Faculty

Professors: Howell (associate dean for research and program evaluation), Butler, Metcalf, Sluzki, Gerber (chronic illness & disability center director), Whittington (associate dean for academic affairs)

Associate Professors: Baghi, Pawloski (chair), Keyser

Assistant Professors: Gewa, Jacobsen, Rudowski, Webster, Weinstein, Winter

Instructors: Freeborne, Gaston, Gillette
The Department of Global and Community Health (GCH) is an academic department within the College of Health and Human Services (CHHS), and as such it echoes the college’s overall goals. Specifically, the educational mission of GCH is to provide undergraduate and advanced degrees in health-related disciplines centered in global and community 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 community, national, and international health.

■ Health Administration and Policy

Phone: 703-993-1929
web: hap.gmu.edu/

Faculty

Professors: Hadley, Maddox (chair), Meiners,

Associate Professors: Eckenwiler, Moidu, Cuellar

Assistant Professors: Carle, Cartwright, Kitsantas, Perlin, Wojtusiak, Yang

Instructors: Henderson (director, outreach & education coordinator), Shiver

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, data security managers, and health policy analysts.

The research and scholarly activities of the department contribute to basic and applied knowledge about the organization and effective management, financing and performance of U.S. health systems and public health services to foster innovation and quality improvement and effective use of information technology by health services researchers, health/social system managers, and public health policy- makers. The Department works with consumers, stakeholders, students, faculty, alumni, research funders, and the community to ensure rigorous, relevant educational programs (including post-graduate professional development), service activities, and the development and timely dissemination of research.

■ Social Work

Phone: 703-993-2030 (Undergraduate programs)
Phone: 703-993-4247 (Graduate programs)
web: chhs.gmu.edu/sw/

Faculty

Professors: Raskin (interim chair), Ritchie, Rose

Associate Professors: Davis, Harris Rome, Vakalahi, Wolf-Branigin

Assistant Professors: Clark, Cleaveland, Ihara, Tompkins,
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 will be provided with 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.

College of Humanities and Social Sciences

Phone: 703-993-8720
Web: chss.gmu.edu
College Code: LA

- Departments and Colleges
- Interdisciplinary Programs
- Administration
- About the College
- Policies for All Students
- Policies for Undergraduate Students
- College Requirements for Undergraduate Students
- Policies for Graduate Students
- Accelerated Master’s Degree Programs
- Minors

Departments and Colleges

- Administration of Justice
- Communication
- Economics
- English
- History and Art History
- Modern and Classical Languages
- Philosophy
- 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 Minors and Certificate (CHSS)
- Interdisciplinary Studies (MAIS)
- Latin American Studies
- Russian and Eurasian Studies
- Women and Gender Studies

Administration

Jack R. Censer, Dean
Dee Ann Holisky, Senior Associate Dean
Jamie Cooper, Associate Dean for Undergraduate Academic Affairs
T. Mills Kelly, Associate Dean for Enrollment Development
Nance Lucas, Associate Dean for New Century College
Matthew Zingraf, Associate Dean for Research and Graduate Programs
Evan Baum, Assistant Dean for Undergraduate Academic Programs
Katie Clare, Assistant Dean for Undergraduate Academic Affairs
Daniel Collier, Director of Information Technology
Leslie Dyre, Director of Finance and Human Resources
Amy Lambrecht, Director of Development
Glenda Morgan, Director of Technology and Learning Initiatives

About the College

The College of Humanities and Social Sciences (CHSS) is composed of 11 departments in the humanities and social sciences and 11 major interdisciplinary programs. The college is also home to New Century College, which offers an innovative interdisciplinary major as well as a first-year experience program for students in all majors, and Technology Across the Curriculum, which promotes the use of technology to enhance learning in all courses and disciplines. The college houses the university-wide Honors Program in General Education for students from all majors. Highly qualified undergraduates can take advantage of honors programs in their majors and accelerated master’s degree programs, which enable them to earn both an undergraduate and a graduate degree in five years. The college has a distinguished faculty of more than 400, including a Nobel laureate, a MacArthur fellow, and recipients of the Pulitzer Prize and Guggenheim Fellowship.

Programs of study at the undergraduate level emphasize global awareness, research experiences, and opportunities such as internships that prepare students for the workforce. Programs of study at the graduate level provide opportunities for career development and advancement, professional education, participation in research, and personal fulfillment. All programs encourage directly or indirectly 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 below. All students are subject to the policies stated in the first chapters of this catalog. Additional policies and procedures for students in the college are presented in this chapter.

George 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 PatriotWeb 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 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.

**Grievances**

Grievances should be directed in writing to the senior associate dean.

**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.

**Policies for Undergraduate Students**

The college offers 16 bachelor of arts (BA) degrees, 7 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, college level
requirements, a major area of study, 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 University General Education chapter for information concerning university-wide general education 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 Institute for Conflict Analysis and Resolution (ICAR) 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 Institute for Conflict Analysis and Resolution chapter.

Questions about Academic Policies

Students with questions regarding exceptions to academic policies and college-level requirements should contact the CHSS Undergraduate Academic Affairs Office (Enterprise Hall, Suite 316; 703-993-8725; chssdean@gmu.edu).

Additional policy information and forms are available online at http://www.gmu.edu/student/academicaffairs/.

Excluded Courses and Credits

Physical Education (PHED) and Parks, Recreation, and Leisure Studies (PRLS) activity courses cannot be counted toward credits required for a degree in the College of Humanities and Social Sciences. Students may use nonactivity PHED and PRLS courses for elective credit for college degrees. For a current list of PHED and PRLS courses that may be used for credit in the college, see the CHSS Undergraduate Academic Affairs Office Web site at at http://www.gmu.edu/student/academicaffairs/. Military Science (MLSC) courses cannot be counted toward credits required for a degree in the college.

Once admitted to Mason, students may not take CLEP exams and apply credits from those exams to degrees in the College of Humanities and Social Sciences. Students may apply credits from CLEP exams to degrees in the college if those credits were awarded at the time of admission.

Academic Load

The university limits undergraduate students with a cumulative GPA below 2.00 to 13 credit hours per semester. All undergraduate students returning from suspension are also limited to a maximum of 13 credit hours. Exceptions to this rule are very rare and only occur in exceptional cases.

Undergraduate students in good standing may enroll in up to 18 credit hours each semester. In exceptional circumstances, students may request an overload of the maximum credit hours. 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.

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

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.
Withdrawals

Courses for which a withdrawal is approved receive a grade of "W".

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.

Consortium of Universities Registration

Participation in consortium registration is available to degree-seeking juniors and seniors in good standing currently enrolled at Mason. Participation is limited to courses that are approved by the student's department chair and academic dean, apply to the student's program of study, are not offered during that semester at Mason, and have space available at the consortium institution. Students should consult with the Consortium Coordinator in the Registrar's Office, as additional restrictions may apply. Students may take just one course per semester, with a career maximum of two courses. 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.

Credit to Be Earned at Other Institutions

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.

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 can seldom be 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 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 http://www.gmu.edu/student/academicaffairs/.

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:

- Have a cumulative GPA of 2.25 or higher at Mason
- Have completed the immediately preceding semester at Mason with a 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.

**Academic Clemency**

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 exception, 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 in writing by the last day of classes for their first semester back at George Mason
- In order to make this request, students should (a) enroll in at least 6 hours during their first semester back at George Mason and (b) earn at least a 2.50 semester GPA with no grade below “C.” If these minimum academic requirements are not met during the first semester of return, then clemency will not be allowed under any circumstances.

Additional information about clemency can be found at [http://www.gmu.edu/student/academicaffairs/](http://www.gmu.edu/student/academicaffairs/).

**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 requirements require the approval of Undergraduate Academic Affairs. When a department denies a substitution or waivers 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. Appeals of these decisions may be made to the Student Policies and Appeals Committee on the basis of procedural irregularity only, and it is the final level of approval.

Student Policies and Appeals Committee is the final level of appeal for college level requirements for CHSS; retroactive 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 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 appropriate section of the Change/Declaration of Academic Program form and submit it to the Office of the Registrar.

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)
- 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 ADJ, ANTH, ECON, GEOG (except GEOG 102 or 309), GOVT, HIST (except 100 or 125), LING, PSYC, or SOCI.
- Natural 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.
- 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. International students should consult the CHSS Undergraduate Academic Affairs Office about a possible waiver of this requirement.
- 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 the following courses:
  - ANTH 114, 300, 301, 302, 304, 305, 306, 311, 313, 330, 332, 396
  - ARTH 203, 204, 319, 320, 380, 381, 382, 383, 384, 385, 482
  - CHIN 318, 320, 325
  - DAN C 118
  - ECON 361, 362
  - FREN 451
  - GEOG 101, 316, 325, 330, 399
  - GOVT 328, 332, 333, 340, 341, 345, 432, 433
  - MUSI 103
  - RELI 211, 212, 272, 313, 314, 315, 337, 374, 375, 490
  - 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.

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. CHSS students 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) with a curriculum grade point average (GPA) of at least 2.75 are considered to have met all of George Mason University’s lower level general education requirements. They are still required by the university to complete English 302 and a synthesis course. Transfer students who meet the conditions above and are pursuing a degree in CHSS 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 degree in CHSS are also 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, including a master of public administration and a master of fine arts in creative writing, and 11 doctoral degrees.

**Graduate Admission**

Admissions decisions are made by faculty committee and are not subject to further appeal.

If an applicant is offered graduate admission, the college reserves the right to withdraw that offer of admission if:

1. 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.
2. There has been a misrepresentation in the application process.
3. 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.

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 provisional qualifier has been removed. 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 written permission of the course instructor, director of the graduate program
offering the course, and the graduate dean.

**Consortium of Universities Registration**

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. More information about the Consortium of Universities can be
found in the Academic Policies chapter.

**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 grade of B or better (3.00 or higher). Courses with grades of P or S
are not accepted for transfer unless the official transcript indicates that the grade is equivalent to a B (3.00) 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 Registrar’s Office 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 Criteria**

All dissertation committees must consist of at least three members of the graduate faculty, two of whom have a full-time
appointment at Mason. At least one member must be a tenured or tenure-track faculty member in the College of Humanities and
Social Sciences, and at least one member must be from outside the student’s academic unit. Additional members may be appointed who are not members of the graduate faculty or who are not full-time employees of the university. Individual departments and programs may set additional requirements for committee membership. The graduate program director recommends appointment of the dissertation committee to the dean. Though the dean appoints the committee it is the responsibility of the student to find qualified faculty who are willing and able to supervise the dissertation.

**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 each semester in the *Schedule of Classes*. 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 detailed information in the Academic Policies chapter of this catalog.

**Graduate Appeals of Dismissal or Termination**

All graduate students should be familiar with the university polices on dismissal and termination as stated in the Academic Policies chapter. 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 programs).

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 Registrar.

Students must fulfill all other master’s degree requirements. For application information, contact the individual graduate degree program.

The college offers these accelerated master’s degree programs:

- Economics
- English with a concentration in linguistics
- Global Affairs
- Philosophy
- Political Science
- Psychology with a concentration in biopsychology
- Public Administration
- Sociology

Minors

- Administration of Justice
- African and African American Studies
- American Government
- Ancient Mediterranean Art and Archaeology
- Anthropology
- Applied Conservation Studies
- Art History
- Asia-Pacific Studies
- Chinese
- Classical Studies
- Communication
- Economic Systems Design
- Economics
- Electronic Journalism
- English
- Film and Media Studies
- Folklore and Mythology
- French
- German
- Global Affairs
- Global Systems
- History
- Immigration Studies
- International/Comparative Studies
- Islamic Studies
- Japanese Studies
- Judaic Studies
- Latin
- Latin American Studies
- Leadership
- Legal Studies
- Linguistics
- Middle East Studies
- Multimedia
- Native American and Indigenous Studies
- New Europe
- Nonprofit Studies
- Philosophy
- Philosophy and Law
- Political Philosophy
- Psychology
African and African American Studies

Phone: 703-993-1201
Web: aaas.gmu.edu/

Faculty
Brigety, Carbonneau, Carton, Cherubin, Clark, Dennis, Fauntroy, Fuchs, Haley, Horton, 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.

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 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.

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.
Administration of Justice

Phone: 703-993-8315
Web: adj.gmu.edu

Faculty

Professors: Mastrofski, Taxman, Weisburd, Zingraff
Research professors: Turner, Waddington
Associate professors: Gallagher, Gould, Wilson (chair)
Assistant professors: Johnson, Lawton, Lum, Merola, Portillo, Rudes, Willis
Assistant research professors: Trotman, Andrew
Term instructors: Newmark, Sizemore, Wheeldon
Affiliate faculty: Uchida

Course Work

The Administration of Justice Department offers all course work designated ADJ and JLCP in the Courses chapter of this catalog.

Undergraduate Programs

The BS in administration of justice provides students with a sound foundation in the liberal arts and a focused study of the justice system as well as the social, human, and moral problems raised in the administration of justice. 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.

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 ADJ 491 and 492. To graduate with honors in ADJ, 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 master's and doctoral degrees in justice, law, and crime policy. Both degree programs draw on a strong multidisciplinary faculty, who teach a wide range of courses in their specialties to support the graduate programs. These
programs can also take advantage of Mason's proximity to 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 as well as to be able to work with local and national justice and security agencies to put those skills to use.

**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.

### Communication

Phone: 703-993-1090  
Web: comm.gmu.edu

**Faculty**

**Professors:** Boileau, Botan, Decker, Friedley, Kreps (chair), Lichter, Lont, Maibach, McAuley, Rowan (associate chair)  
**Emeritus professors:** Looney, Manchester, Taylor  
**Associate professors:** Gibson, Muir, Nicotera, Villagran  
**Assistant professors:** Cai, Farnsworth, Hopson, Zhao  
**Term full professor:** Pober  
**Term associate professor:** Finn  
**Term assistant professors:** Bedore, Wright  
**Term research assistant professor:** Roser-Renouf  
**Term instructors:** Anderson, M. Dickerson, Haynes, Klein, R. Smith, Talkington, Tomasovic, Warren  
**Term research instructor:** McCutcheon  

**Adjuncts:** Ahmad, Akyeampong, Atwell, Aw, Barber, Beck, Biedrycki, Chaaban, Chilcote, Clark, Cordero, Dance, Dickerhoof, N. Dickerson, Dillon, Doyle, Effros, Feigenbaum, Fisher, Garifo, Gauthier, Gladis, Greiner, Hadji, Hansche, Harzold, Holsonbake, Kahn, Kehoe, Kohlmann, Kraus, Kubiske, Ledford, Lehman, LeValley, Long, Mangus, Mattox, Moss, Outlaw, Payne, Peck, Plaag, Schmeidler, Simpson, Slagle, Stumpo, Suarez, Trowbridge, Van Zummeren, Walsch, Walter, Wilson, Wolyn, R. Wood

**Affiliate:** J. R. Censer (professor)

### 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 in from one of these areas: interpersonal and organizational communication, journalism, media production and criticism, persuasive and political communication, and 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 who have completed 80 credits with an overall minimum GPA of 3.50 and a minimum GPA of 3.50 in communication courses are eligible to apply. They must have satisfactorily completed or be enrolled in COMM 200, 300, 301, 302, 305, and 400. Eligible students are invited to submit a proposal for an honors thesis, and, if the proposal is approved, they are admitted to the program. To receive honors in the major, students must complete specific course work with a minimum GPA of 3.5 and write an acceptable honors thesis. For more information, contact the director of honors in communication.

**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, 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 master's and a doctoral degree in communication with two major areas of emphasis: strategic communication and health 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 public relations theory and research, teach courses on planning, developing, executing, and evaluating public communication campaigns. Faculty in health communication teach courses which explore the relationship between communication practices and the health and well-being of individuals and communities. This ranges from how to improve cooperation and coordination between health care providers and patients to how to develop more effective health promotion campaigns.

Strategic communication and health communication are two of the most rapidly expanding specialties within the broad field of communication. Graduates of these programs find a very welcoming employment market for 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.

Cultural Studies

Phone: 703-993-2851
Web: culturalstudies.gmu.edu

Faculty

Albanese, Amireh, Best, Bickford, Bockman, Burr, Censer, Chang, Copelman, Deshmukh, Foster, Froman, Fuchs, Gibson, Gilbert, Greet, Guagnano, Gusterson, Hanrahan, Hodges, Holt, Jacobs, Jann, Johnsen-Neshati, Kaplan, Kapsoy, Karush, Kaufmann, Lancaster (director), Landsberg, Leeman, Lont, Mandaville, Matz, Miller, O’Connor, O’Malley, Palkovich, Rabin, Ricouart, Rosenblum, 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 thus 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. CULT 320 - Globalization and Culture is a core requirement for global affairs majors.

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 gender, sexuality, and body studies; visual culture and media studies; political economy and globalization; and race, ethnicity, and nation.

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. For students interested in cultural studies who do not meet this requirement, the university has established a number of related master's degrees. Students are encouraged to apply to one of these programs. See Graduate Programs in the English, History and Art History, Modern and Classical Languages, Philosophy, Religious Studies, and Sociology and Anthropology sections of this chapter. These programs cumulate in a capstone seminar, CULT 802.

Students may, if they wish, apply simultaneously to one of these master's degrees and the doctoral program simultaneously so that faculty may review their academic promise and suitability for the program. Students who wish to apply to two degree programs at the same time need to submit two separate applications. Especially strong candidates with bachelor's degrees may be admitted into the doctoral program on a conditional basis. Admission is contingent on their performance in the master's degree program, particularly in CULT 802.

Economics

Phone: 703-993-1130
Web: economics.gmu.edu

Faculty

Distinguished professor emeriti: Buchanan, Smith, Tullock

Professors: Bennett, Boettke, Boudreaux, Congleton, Cowen, Crain, Heiner, Houser (chair), Klein, Levy, McCabe, Nye, Richardson, Roberts, Rowley, Stratmann, Wagner, Williams

Associate professors: Caplan, Hanson, Meyer, Ramirez, Reid, Tabarrok, Thorbecke, Wiest

Assistant professors: Al-Ubaydli, Johnson, Jones, Leeson

Instructor: Rustici

Professors emeriti: Chung (emeritus), Phillips (emeritus), Snavely (emeritus), Vaughn (emerita)

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 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.
The bachelor of arts degree program is designed primarily for students with a stronger interest in the liberal arts. It is appropriate for those who prefer a less quantitative degree program and may be especially appropriate 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 teaching and research 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.

**English**

Phone: 703-993-1160  
Web: english.gmu.edu

**Faculty**

**Professors:** Cheuse, D’Andrea (Robinson Professor), Foster, Goodwin, Hodges, Jann, Lathbury, Lowry, Nadeau, Pankey, Tichy  

**Associate professors:** Albanese, Amireh, Anderson, Atkinson, Burr, Clark, Fuchs, Gallehr, Hawk, Holisky, Jones, Kaplan, Kaufmann, Keaney, Kuebrich, Lattanzi Shutika, Matz (chair), Mori, Rutledge, Weinberger, Yadav, Yocom, Zawacki

**Assistant professors:** Brkic, Chang, Eisner, Eyma, Habila, Harvey, Hoffmann, Keith, Lawrence, Lin, Lockwood, Malouf, Marcantonio, McCarthy, Michals, Reid, Rogers, Sample, Scarlata, Stanica, Widerhold, Wulf

**Term associate professors:** Koch, Michals, Miller, Samuelian, Scott, Taciuch, Thompson
Term assistant professors: Beach, Berg, Burnham, DeNys, DeFazio, Habib, Jacobs, Johnson, Lister, Matthews, McGeehan, Nanian, Nichols, Rudnicki, Saunders, Taylor, Williams

Term instructors: Hoy, Raffel, Scolaro

Adjunct assistant professors: Broyles, Cabral, Casal, Dreisonstok, Fletcher, Fowler, Humbertson, Johnston, Kuhta, Moody, Pabich, Redondo, Waldron

Adjunct instructors: Baker, Cooper, Dutta, Grogan-Barone, Johnston, Lawrence, McKinney, Morris, Rhein, Surrette

Course Work

The English Department offers all course work designated CL, ENGL, LING, and NAIS in the Courses chapter of this catalog.

Related Courses

Courses offered by other departments are occasionally crosslisted with English and given the ENGL course designator; such courses may be counted toward the English major.

Undergraduate Programs

The department offers a bachelor's degree in English, a versatile major with thirteen specialized concentrations that are designed to meet students' individual interests and career objectives. English majors can also pursue a special option in comparative literature or 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.

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 the honors course sequence and receive a 3.50 GPA in all courses counted toward the major and, separately, a minimum 3.50 GPA in their honors courses. Honors courses may simultaneously satisfy concentration and distribution requirements in the major.

Students may satisfy the honors course sequence in several ways:

- Students may take two sections of ENGL 414 Honors Seminar.
- Students may take one section of ENGL 414 Honors Seminar and ENGL 415 Honors Thesis Writing Seminar.
- Students in the creative writing concentration may take one section of ENGL 414 Honors Seminar and write a creative honors thesis in ENGL 416 Honors Independent Study.
- Students in the nonfiction concentration may take ENGL 416 Honors Independent Study in conjunction with an advanced course in nonfiction writing and complete a nonfiction thesis as part of ENGL 415 Honors Thesis Writing Seminar.

See the English Department for application procedures and other information.
**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, available to students in any major.

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 Interdisciplinary Minors 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 599. 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. Conferences are free to all Mason students, faculty, staff, and alumni. Writing Center tutors, who are graduate teaching assistants in the English Department, have been trained in current methods of composition instruction. They can help clients overcome writing anxiety, develop organizational and revision skills, and learn useful strategies for editing their own work. Appointments should be made by calling 703-993-1200 or stopping by the center in Robinson Hall A, Room 11, to schedule a session.

**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 offers a terminal degree, the MFA in creative writing, with concentrations in fiction, poetry, and nonfiction. Faculty from the department coordinate the concentration in Folklore in the master's degree in individualized studies (MAIS). See the ■ Interdisciplinary Studies (MAIS) section of this chapter for details.

**Funding**

The department 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 show satisfactory progress toward their degree.

**Certificates**

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 the certificates may be able to be applied to a degree. Students must apply and be admitted to a graduate certificate program.

■ **Global Affairs**

Web: globalaffairs.gmu.edu

**Course Work**

The Global Affairs programs offer all course work designated GLOA in the Courses chapter of this catalog.

**Undergraduate Programs**

Phone: 703-993-9185

**Faculty**


**Bachelor's Degree**

The bachelor's degree in global affairs is an interdisciplinary 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. They also 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, and so on) 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.

**Global Affairs with a Second Major**

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.

**Minors**

The undergraduate program in global affairs offers a minor in global affairs, which is available to students in any major in the university.

Students majoring in global affairs are encouraged to complement their major one of the many minors offered by the college.

**Graduate Programs**

Phone: 703-993-2152

**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, sometimes within five years.

**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. Students must apply and be accepted to a graduate certificate program.
History and Art History

Phone: 703-993-1250
Web: historyarthistory.gmu.edu

Faculty

Mathy Professor: Mattusch (art history)

Robinson Professor: Crew, Bakhash (history)

Professors: J. R. Censer (dean), J. T. Censer, Holt, Kiermer, Petrik, Sherwin, Stearns (provost), Stewart, Wade, Zagarri (history)

Associate professors: Bristol, Carton, Chang, Cohen, Copelman, Deshmukh, Hamdani, Karush, Kelly, Landsberg, Lytton, O’Malley, Platt (chair), Scully, Smith (history); Butler, DeCaroli (director), Todd (art history)

Assistant professors: Barnes, Bottoms, Bristol, Collins, Hamner, Lair, McDow, Schrag (history); Greet (art history)

Term faculty: Leon, Manuel-Scott, McCord, Orens, Scheinfeldt, Schrum, Walmsley (history); Gregg, Richardson (art history)

Postdoctoral teaching fellows: Hudgins, Salinas, Scales, Wolf

Course Work

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 one of 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. 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 a 3.50 overall GPA and a 3.50 GPA in history 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.

To graduate with honors in the major, students must 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. These 6 credits must be passed with a minimum 3.50 GPA, and the overall history GPA presented for graduation must be a minimum of 3.50. These 6 credits may be counted toward the 36-credit major requirement in history, but they do not replace HIST 499.

Minors

The department offers a minor in history available to students in any major.

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 credits toward these minors by taking selected history and art history courses. For details, see the 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 section in the College of Education and Human Development chapter of the catalog.

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 a 3.50 overall GPA and a 3.80 GPA 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.

To graduate with honors in the major, students must 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. These 6 credits must be passed with a minimum 3.50 GPA, and the overall art history GPA presented for graduation must be a minimum of 3.50. These 6 credits may be counted toward the 33- to 34-credit major requirement in art history, but they do not 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.

The Art History Program coordinates the Ancient Mediterranean Art and Archaeology Minor. See the 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.

Honors Program in General Education

Phone: 703-993-1110
Web: honors.gmu.edu

Faculty
The program offers all course work designated HNRS in the Courses chapter of this catalog.

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 track in science, technology, engineering, economics, and mathematics offers honors sections of first-year courses in these disciplines, as well.

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. Students apply to the Honors Program when applying to Mason by selecting the box that indicates they are interested in the Honors Program and by completing an additional essay question. If the application meets the criteria for admission to the Honors Program, the applicant will receive an invitation to the program shortly after receiving the acceptance letter to the university.

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 certain HNRS courses, excluding HNRS 110 and HRNS 353.

Requirements

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. Students then have a choice of two tracks, determined by their majors and degrees. The STEM track is designed for students pursuing a bachelor of science degree in science, technology, engineering, economics, or mathematics. The Liberal Arts and Social Sciences (LASS) track is for students pursuing a bachelor of arts degree, who have additional college level requirements.

To receive honors in general education on their transcript, students must earn a minimum GPA of 3.00 in HNRS courses and 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.
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 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) degree provides an alternative to the traditional baccalaureate, offering 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 BIS 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.

There are two pathways for obtaining this degree. Students can design their own individualized interdisciplinary program of study or pursue a standardized concentration. These alternatives require different course work, prerequisites, and eligibility.

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. The concentration in early childhood education studies is an exception to the seven-year time limit.

Application and Admission

Students interested in the BIS program must attend an information session and apply separately to the BIS Program in addition to applying to Mason through the Office of Admissions. The BIS information session schedule and application form are available online at www.bis.gmu.edu. Admission is selective and based on a minimum GPA of 2.50 on previous course work.

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). Students accepted to the honors in the major must complete a BIS 391 and BIS 490 (an individualized section) with a minimum GPA of 3.5, maintain a cumulative GPA of 3.75 or higher, and successfully present their research during the Senior Capstone Project presentations.

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. For an approved list, go to admissions.gmu.edu/exams/ExamCLEP.asp (45 maximum credits).
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 (45 maximum credits) and be approved for Mason credit. The specific credits must also be approved by the program director and the dean. Note: Total combined credit for exams and ACE-approved training cannot exceed 60 credits. For example, if 45 credits are accepted by ACE-approved training, a maximum of 15 credits can be accepted for the exam.
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).

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 BIS degree, not all university and program requirements can be fulfilled in these ways. These nontraditional credits are not transferable to other degree programs at Mason.

Bachelor’s/Accelerated Master’s Program

The program offers highly qualified undergraduates the opportunity to apply to an accelerated master’s degree program in telecommunications. If accepted, students will be able to earn both an undergraduate and a graduate degree after satisfactory completion of 144 credits.

■ Interdisciplinary Minors and Certificate (CHSS)
The College of Humanities and Social Sciences offers many minors and one certificate in interdisciplinary areas of study. These minors require course work from two or more disciplines and are administered by interdepartmental faculty groups, often faculty from across the university.

Other interdisciplinary minors are offered by departments and programs in the college. These include:

- African and African American Studies
- Global Affairs
- Judaic Studies
- Japanese Studies
- Latin American Studies
- Leadership
- Nonprofit Studies
- Women and Gender Studies

For policies governing all minors, see the Academic Policies chapter of the catalog.

### Interdisciplinary Studies

Phone: 703-993-8762  
Web: mais.gmu.edu

### Executive Committee

Addleson, Burns, Hodzic, Kidd, Lont, Martin, O'Connor, Rodgers, Salmon, Shutika, Simmons, Snyder-Hall (director), Sorrell, Wood, Vitazkova, Yocom

### Course Work

This program offers the courses designated MAIS in the Courses chapter of this catalog. However, students in the Master of Arts in Interdisciplinary Studies (MAIS) 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 for specialized and individualized graduate study. Students choose one of eight 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. Student complete their degrees with a project or thesis.

### Concentrations

Students pursuing a master's degree program in interdisciplinary studies can choose a concentration in community college teaching or higher education, both sponsored by the Higher Education Program. They can do a concentration in folklore, sponsored by the faculty in English or one in religion, culture, and values, sponsored by Religious Studies. The video-based
production concentration is sponsored by the Communication Department, while the concentration in women and gender studies is sponsored by the Women and Gender Studies Program and that in Zoo and Aquarium Leadership, by New Century College.

For a variety of reasons, traditional graduate programs are not able to meet the specific educational goals of some students. They can choose the individualized concentration. With the help of a faculty advisor, they design an individualized program of study that includes courses from several academic disciplines.

■ 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), Ramos-Pellicia (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 cumulates 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 at least a 3.50 overall GPA and at least a 3.50 GPA within 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 then complete a two-course sequence – LAS 491 and LAS 492 – 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 at least a 3.5 in these two courses. Students who complete LAS 491 and LAS 492 do take LAS 499, the regular capstone class in the major.

Modern and Classical Languages

Phone: 703-993-1220
Web: mcl.gmu.edu

Faculty

Professors: Gilbert, Ricouart, Winkler
Associate professors: Berroa, Chamberlain, Christensen (chair), Goldin, Leeman, Levine, Rabin, Roman-Mendoza
Assistant professors: Carreño-Rodriguez, Markx, Olson, Ramos-Pellicia, Sanusi, So, Vivancos-Perez
Term associate professors: Zhang
Term assistant professors: Apitz, Falcon, Fujiwara, Fyfe, Quintana, Ruiz-Ross, Salawdeh, Vasilyeva
Term instructors: Chen, Hilmi, Kirsch, Lamothe, Mircea-Pines, Planas, Sweet

Course Work

This department offers all course work designated ARAB, CHIN, CLAS, FREN, FRLN, GERM, GREE, HEBR, ITAL, JAPA, KORE, LATN, RUSS, and SPAN in the Courses chapter of this catalog.

The following courses are offered in English. Knowledge of a foreign language is not required: ARAB 325; CHIN 310, 311, 320, 325, 328; FREN 325, 329; GERM 301, 325; ITAL 325; JAPA 320; RUSS 325, 326, 327, 353, 354; SPAN 321, 322, 325, 329; and all courses designated CLAS and FRLN.

Courses numbered 325 may be repeated once for credit if the authors studied are different.

General Education Requirements

The department offers courses approved to fulfill university general education requirements: RUSS 354 and SPAN 322 fulfill the general education requirement in global understanding; FRLN 385, RUSS 353, and SPAN 388 fulfill the general education synthesis requirement; a number of courses fulfill the general education requirement in literature; RUSS 354 and SPAN 322, which are approved to fulfill the general education requirement in global understanding. See the University General Education chapter of the catalog.

College-Level 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 Sciences and the College of Science. FREN 451, RUSS 353, and RUSS 354 fulfill the college-level requirement in non-Western culture.
Undergraduate Programs

The department offers a bachelor's degree in foreign languages with concentrations in French and Spanish.

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, 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.

Both 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.

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.

Minors

Language majors are encouraged to complete a minor in another field.

The department offers minors in classical studies, Japanese studies, Chinese, French, German, Latin, Russian, and Spanish. They are available to students in any major. Except for classical studies, all the minors have as a prerequisite the completion of an intermediate course in the relevant language.

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.

Students are encourage to participate in the many study abroad programs offered by Mason. These include short courses during winter and spring breaks as well as semester-long programs in the French and Spanish speaking regions of the world.

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.

■ Philosophy
Faculty

Professors: Bergoffen, Rothbart

Associate professors: Cherubin, De Nys, Eckenwiler, Froman, Holman, Kinnaman (chair), Light, Paden

Term professor: Boyd

Adjunct professors: D. Gregory, J. Miller, Oberoi, Register, Sigrist, Sojka, Van Camp

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 in the major of 3.50. 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.

To receive honors in the major, students must 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 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 and in professional ethics. 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.

With its focus on traditional and contemporary philosophy, the master's degree program provides students with a historical and pluralistic approach to philosophical questions. The concentration in professional ethics gives students the opportunity to explore the ethical and philosophical issues that arise in such professional 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.

Students are encouraged to pursue opportunities beyond the classroom such as study abroad, professional internships, and research with faculty members.

The department also offers a graduate certificate in professional ethics for those students interested in combining the study of ethics in a variety of career settings. Students may earn the certificate as a stand alone program or pursue it concurrently with a graduate degree program. Part of the coursework for the certificate may be able to be applied also to a degree program. Students must apply and be admitted to the graduate certificate program.

**Psychology**

Phone: 703-993-1342  
Web: gmu.edu/departments/psychology

**Faculty**

*Professors:* Ascoli, Boehm-Davis (chair), Cortina (associate chair for graduate studies), Denham (director, Applied Developmental Program), Klimoski, Maddux, Mandes, Naglieri, Parasuraman (director, Human Factors/Applied Cognition Program), Pasnak, Riskind, Rojahn (director, School Psychology Program, director, Center for Cognitive Development), R. Smith (director, Biopsychology Program), Tangney, Tetrack (director, Industrial/Organizational Program), Winsler, Zaccaro

*Research professors:* Butler, Olds

*Associate professors:* Bitler, Blackwell, Buffardi, Finn, Greenwood, Kello, Kozhevnikov, Peterson, Sanford (associate chair for undergraduate studies), Short (director, Clinical Program)

*Research associate professors:* Bachus, Warren

*Assistant professors:* Baldwin, Cattaneo, Dalal, Kashdan, Kaplan, King, McKnight, Mohr, Monk, Perez-Edgar, Rowe, Thompson

*Term associate professors:* Chrosniak, Wanschura

*Research assistant professors:* Bassett, Fu, McDonald, Stuewig, Tran
Term assistant professors: Battaglia, Hurley, Meier

Affiliates: Eby, Hunt

Adjuncts: Anderson, Benedi, Curtin, Dechman, Hawley, Hirsch, Levitas, Mayfield, Perez, Pomeroy, Schumann, Shiraev, Stanhope, Steve, Werber

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 biospychology. Students can also choose from special topics courses such as forensic psychology and romantic relationships.

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 cumulates in the successful completion and presentation of an independent honors thesis. To graduate with honors, students must earn at least 3.50 in the three 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.

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 biospychology. If accepted, students will be able to earn both an undergraduate and a graduate degree in psychology, the master's with a concentration in biospychology, 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, biopsychology, 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 in school psychology as well as a certificate of advanced graduate studies 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.

**Public and International Affairs**

Phone: 703-993-1400  
Web: pia.gmu.edu

**Faculty**

**Robinson Professors:** Heclo, Paden  
**Emeritus faculty:** Brown, Clark, Early, Gortner, Hart-Nibbrig, Knight, White  
**Professors:** Abramson, Cioffi-Revilla, Conant, Conlan, Druckman, Dudley (chair), Katz, Posner, Regan, Sockett, Wan, Wilsford  
**Associate professors:** Balint, Burt, Dueck, Hackler, Harbour, Lukacs, Mahler, Mandaville, McDonald, McFerson, Miller, Nguyen, Sacco, Snyder-Hall, Toepler, Travis  
**Assistant professors:** Benjamin, Bowie, Brigety, Haddad, Koblenz, Lopez-Santana, Ougrah-Gormley, Robbins
Term assistant professors: Burroughs, Palubinskas, Walker


Affiliate faculty: Bushee, Casamayou, Connolly, Edner, Shogan

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 and nonprofit management, computer applications, and business administration.

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 GPA of at least 3.00.

Minors

The department offers minors in American government, international/comparative studies, legal studies, and public policy and management. In addition, it coordinates the Asia-Pacific Studies Minor, Global Systems Minor, and Urban and Suburban Studies Minor and participates with the Philosophy Department in the Political Philosophy Minor. See the Interdisciplinary Minors section in this chapter for descriptions of these minors.

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. They offer a master's 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, publica and nonprofit finance, state and local government, or third-party governance.

**Funding**

The department offers 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.

**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.

■ **Religious Studies**

Phone: 703-993-1290  
Web: religious.gmu.edu

**Faculty**

**Associate professors:** Burns, M. Dakake, Farina, Nguyen, Rashkover, Ro (chair), Shiner  
**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.

The department also offers minors in religious studies and Judaic studies, both of which are available to students in all majors.

Graduate Programs

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 (MAIS) section of this chapter for details.

■ 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), Vasilyevna-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 Programs

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.

■ Sociology and Anthropology
Faculty

Emeritus faculty: Black, Dumont, Golomb (anthropology); Borkman (sociology)

Professors: Gusterson, Lancaster, Seligmann, Williams (anthropology); Dennis, Haines, Kurtz, Rosenblum, Scimecca (sociology)

Associate professors: Bryant, Palkovich, Snead, Trencher (chair) (anthropology); Best, Guagnano, Hanrahan, Jacobs, Rader (sociology)

Assistant professors: Benitez, Bickford, Mantz (anthropology); Bockman, Dale, Davis, Kim, Samara (sociology)

Term associate professor: Masters (sociology)

Term assistant professors and instructors: Arabandi, Zimmerman (sociology)

Affiliate professors: Avruch (anthropology); Bainbridge, Goldstone, Johnson, Levine, Zingraff (sociology)

Adjuncts: Minnich, Nambiar, Pearlman, Sandole-Staroste

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 may apply to graduate with honors in the major. Eligible students must have completed at least 60 credits, taken ENGL 302 for the social sciences, completed 15 credits of anthropology (including ANTH 114, 120, and 135), and have a minimum cumulative GPA of 3.50 and a minimum GPA of 3.75 in anthropology courses.

To graduate with honors in the major students must successfully complete a sequence of special honors sections: ANTH 492 (for those focusing on sociocultural anthropology) or ANTH 420 (for those interested in archaeology or biological anthropology) both plus ANTH 499, where they conduct additional research leading to the completion of an honors thesis. For more information, contact the anthropology undergraduate director.

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 may apply to graduate with honors in the major. Eligible students must have completed at least 75 credits with a minimum of 15 credits in sociology (6 of which must have been taken at Mason) and have a minimum cumulative GPA of 3.50 and a minimum GPA of 3.75 in sociology courses.

To graduate with honors in sociology, students must complete SOCI 480 and 481 with a minimum GPA of 3.50 overall and in sociology courses presented for graduation. The 6 credits of honors courses may count toward the major requirement in sociology. For more information or application procedures, contact the department.

**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 Immigration Studies Minor. See the 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 chose from many courses that are richly interdisciplinary, and cover 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 a master's and doctoral degree 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, and up to nine credits earned in nondegree status may be transferred to the master's degrees in anthropology or sociology, subject to the approval of the program director and dean.

■ **Women and Gender Studies**

Phone: 703-993-2896  
Web: wmst.gmu.edu

**Faculty**

Amireh, Baker, Beach, Bergoffen, Bernard, Best, Bullard, Burr, Carbonneau, Cattaneo, Censer, Cheldelin, Cherubin, Christensen, Cohen, Constantine, Copelman, Davidson, Davis, Deshmukh, Dunne, Eby, Fischer, Friedley, Fuchs, Fyfe, Gilbert, Gring-Pemble, Hamdani, Hanrahan (director), Harvey, Hodges, Hodzic, Jadallah, Johnsen-Neshati, Jordan, Kaplan, Karametou, King, Kirkland, Kirsch, Koch, Lont, Mann, Masters, Michals, Misencik, Muir, Palkovich, Pascarell, Pawloski, Rabin, Regan, Ricouart, Rosenblum, Samuelian, Sandole-Staroste, Scott, Seligmann, Snyder-Hall, Stearns, Tichy, Todd, Tolchin, Travis, Vivancos Perez, Yocom, Zawacki

**Course Work**

The Women and Gender Studies Department 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 roles in social, political, cultural, and economic life; gender roles 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 towards 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 activites 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 able to be applied to the degree. Students must apply and be accepted to a graduate certificate program.

**Women and Gender Studies Center**

The academic program is closely affiliated 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 hosts a library and functions as a community space for students and faculty. It supports the Gender Justice Research Group, a monthly forum for research on gender and global human rights, as well as the Gender Research Project, a methodology class and project focused on gender issues on the Mason campus.

■ **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:** Cambridge, Freeman, Gilmore, Gorski, Owen  
**Term assistant professors:** Fuertes, Scott, Vitazkova
Adjunct faculty: Bernard, Bruno, Grymes, Holder, Johnson, Saddler, Sweetman, Underwood, Uy-Tioco

Administration

Nance Lucas, Associate Dean
Kelly Dunne, Director of Academic Affairs
Karen Misencik, Director of Experiential Learning
Sarah Sweetman, Director of Student Services
Misty Hensley-McGaffey, 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 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.

Students who enroll in this degree program in their first year at Mason take Mason Cornerstones (see below). All students complete their degree programs with an interdisciplinary concentration. See the programs of study below. Students develop mastery of nine essential competencies (communication, valuing, global understanding, problem solving, group interaction, effective citizenship, aesthetic awareness, critical thinking, and information technology) assessed through freshman and graduation portfolios.

Mason Cornerstones

New Century College offers an interdisciplinary first-year program known as Mason Cornerstones. This is open to students in any major. Cornerstones is a 24-credit program that consists of a sequence of four courses: NCLC 101, 102, 103 and 203.

Students who successfully complete Mason's Cornerstones will have met the university general education requirements in lower-level written communication, oral communication, information technology, literature, arts, non-laboratory natural science, global understanding, and social and behavioral sciences.
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 leadership studies and nonprofit studies. Both are available to students in any major.

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 MAIS section of this chapter for details.

Centers

New Century College houses 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.

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, Grefenstette, Kabbani, Kalbfleisch, 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 2007, the institute became an academic unit housing the Molecular Neuroscience Department and the Computational Social Science Department. With an annual budget of $3.3 million, the institute is home to a scientific staff of 60. 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 $26.5 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 Department**

Phone: 703-993-9298
Email: cssgrad@gmu.edu
Web: socialcomplexity.gmu.edu/index.php

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.

**Molecular Neuroscience Department**

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 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.

**School of Management**

Enterprise Hall
Phone: 703-993-1807
SOM faculty members have research and teaching expertise on topics such as executive compensation, effect of insider trading on stock prices and e-commerce, and international work groups and teams. Faculty members have provided testimony to nearly every federal agency and served as consultants to industry and organizations such as NASDAQ, the Federal Deposit Insurance Corporation, and the Department of Defense.

Today, more than 4,300 students are studying in five undergraduate majors, the business minor, and five graduate programs. SOM’s offerings provide a solid business core that emphasizes information technologies and communication, entrepreneurial thinking, and a global business strategy. We prepare students to lead with initiative, imagination, and innovation. The Mason MBA, Executive MBA, and MS in Technology Management are pioneers nationwide, being among the first graduate business programs to require a global residency program for all graduate business students.

Of all the business programs in the world, only 560 are fully accredited by the Association to Advance Collegiate Schools of Business (AACSB) International. SOM is one of only 168 business schools with both AACSB business and accounting accreditation.

A Mason business degree provides in-depth exposure in an area of specialization, as well as the skills required for success in a global business world. The school’s unique undergraduate keystone and capstone courses develop communication and analytical skills and provide students with opportunities to interact with regional business leaders.

More than 90 percent of the school’s graduate students study while employed, which gives them numerous opportunities to link classroom learning to real-world business challenges. Because our graduate programs emphasize learning in teams, each student has the opportunity to test classroom concepts against the best practices of some of the region’s premier organizations. SOM integrates teamwork, technology, and innovation into a state-of-the-art curriculum to prepare students for tomorrow’s business environment.

**Administration**

**Jorge Haddock**, Dean  
**David J. Harr**, Senior Associate Dean  
**Alison S. O’Brien**, Associate Dean, Undergraduate Programs  
**Angel J. Burgos**, Director, MBA Program, MSA Program  
**Roy W. Hinton**, Associate Dean, Executive Programs, and Director, Executive MBA Program  
**Karen Hallows**, Academic Director, Executive MBA Program  
**Hilda M. Maness**, Director, Development  
**Pamela A. Allen**, Assistant Dean, Academic and Career Services

**Faculty**

**Accounting**

Aier, Blue, Buchanan, Chen, Dafashy, Douthett, Hasan, Hylton, Jones, Kitching, Lei, Magro, Nutter, Pevzner, Sengupta, Shen, Visvanathan, Warne, Zadeh, Zhang

**Finance**

Canterbury, Christophe, Crockett, Ferri, Gao, Hanweck, Hsieh, Johnston, Nikolova, Philipov, Stahel, Wang, Xie, Zhdanov

**Information Systems and Operations Management**
Management

Coffinberger, Cramton, Cronin, Demory, Joshi, Klimoski, Kravitz, Langfred, C. Lee, H. Lee, Lei, Ling, O’Brien, Parker, Rockmann, Samuels, Wolf, Wolfe, Yasai

Marketing

Cheng, Entrikin, Harvey, Joiner, Jaju, Kulick, Li, Martin, 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, MSOM, OM, 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 Taxation, and MS in Technology Management. Two graduate certificates are also available in Spatial Business Intelligence and Real Estate 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.

School of Public Policy

Finley Building
4400 University Drive, MS 3C6
Fairfax, VA 22030
Phone: 703-993-2280
Web: policy.gmu.edu
E-mail: spp@gmu.edu

3401 Fairfax Drive, MS 3B1
Arlington, VA 22201
Phone: 703-993-8200
Web: policy.gmu.edu
E-mail: spp@gmu.edu
College Code: PP
Rooted in the strong democratic government traditions of the commonwealth of Virginia, the School of Public Policy (SPP) is committed to transcending traditional conceptual boundaries of research and teaching by integrating real-world experience and problem solving into public policy education. The school’s programs focus on the interplay of culture, organizations, and technology to find alternative approaches to public policy decisions and policy making. Teaching and research are focused on the following principal themes: governance; regional and economic development; international commerce and policy; science and technology policy; transportation policy; entrepreneurship; and culture and values in public policy.

SPP contributes to new and innovative concepts in policy formation while building on the fundamental, pluralistic, and democratic characteristics of policy making in the United States. SPP endorses creativity and responsibility in governance, public management, and the development of economic policy.

Administration

Kingsley E. Haynes, Dean
James H. Finkelstein, Vice 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 Services
Leslie Metzger Levin, Assistant Dean for Graduate Admissions and Marketing

Faculty


associate Faculty

Avruch, Bernold, Conlan, Donahue, Flood, Frase, Friesz, Guagnano, Heclo, Hennessey, Mahler, Paden, Regan, Scimecca

Research and Term Faculty

Benson, Courtot, Davis, Ferrin, Ha, Holleman, Johnson, Keenan, Kil, Kingston, Leitch, Malur, Nicogossian, Paelinck, Regan, Riggle, Robb, Segerson, Spalding, Wheeler

Adjunct Faculty

Bensimon, Burris, Fowler, Gaske, Gianturco, Gordon, Kewley, Muhlhansen, Robinson, Rogowsky, Stabile, Sullivan, Thompson, Varkonyi, Watkins

Faculty Emeritus

Kash, Warfield

Course Work
SPP offers courses designated PUBP, ITRN, MNPS, LRNG, and TELE in the Courses chapter of this catalog. Other academic courses are offered in conjunction with the research activities of the Mason Enterprise Center.

**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](http://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.

**Research Centers**

- **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 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.

- **Mason Enterprise Center**
  **Director:** Kingsley E. Haynes, PhD

  Dedicated to creating and developing businesses in the Washington, D.C., area, the Mason Enterprise Center (MEC) is the synthesis of seven programs designed to meet the needs of growing businesses. The center focuses the energy, skills, and intellectual capital of the university on enterprise creation, expansion, and restructuring. MEC is highly geared on providing its clients with services that add value to their organizations. The center specializes in business development, entrepreneurship, government contracting, international business, technology ventures, and telework, making it a business-development center unlike any other. In addition, MEC conducts seminars and conferences related to its areas of expertise.

- **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 Science and Technology Policy**  
**Director: Philip Auerswald, 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.

**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.

**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 entrepreneurship 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 Aerospace Policy**  
**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.

**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.

College of Science

Phone: 703-993-3622
Web: cos.gmu.edu
College Code: SC

Departments

- Atmospheric, Oceanic and Earth Sciences
- Bioinformatics and Computational Biology
- Chemistry and Biochemistry
- Computational and Data Sciences
- Environmental Science and Policy
- Geography and Geoinformation Science
- Mathematical Sciences
- Molecular and Microbiology
- Physics and Astronomy

Additional Academic Units

- Biology Undergraduate Program
- Forensic Science Program
- Neuroscience Program

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 9 departments, 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.
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 10 master’s degrees and 10 doctoral degrees. The requirements for each degree are described in the departmental and degree sections that follow. 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.

Undergraduate Degree Programs

COS offers 6 bachelor of arts degrees and 10 bachelor of science degrees. These undergraduate degree 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
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 for a total of 6 credits. These 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 any course in ADJ, ANTH, ECON, GEOG (except GEOG 102 or 309), GOVT, HIST (except 100 or 125), LING, PSYC, or SOCI.
- 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, 301, 302, 304, 305, 306, 311, 313, 330, 332, 396; ARTH 203, 204, 319, 320, 380, 381, 382, 383, 384, 385, 482; CHIN 318, 320, 325; DANC 118; ECON 361, 362; FREN 451; GEOG 101, 316, 325, 330, 399; GOVT 328, 332, 333, 340, 341, 345, 342, 433; HIST 130, 251, 252, 261, 262, 271, 281, 282, 328, 329, 353, 354, 355, 356, 365, 366, 367, 387, 426, 459, 460, 461, 465, 466; 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 appropriate section of the Change/Declaration of Academic Program 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 (Enterprise Hall, Suite 316; 703-993-8725; cosdean@gmu.edu). Additional policy information and forms are available online at www.gmu.edu/student/academicaffairs.

**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**

The university limits undergraduate students with a cumulative GPA below 2.00 to 13 credit hours per semester. All undergraduate students returning from suspension are also limited to a maximum of 13 credit hours. Exceptions to this rule are very rare and only occur in exceptional cases.

Undergraduate students in good standing may enroll in up to 18 credit hours each semester. In exceptional circumstances, students may request an overload of the maximum credit hours. 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.

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

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.

**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 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.

University Consortium Registration

Participation in consortium registration is available to degree-seeking juniors and seniors in good standing currently enrolled at Mason. Participation is limited to courses that are approved by the student’s department chair and academic dean, apply to the student’s program of study, are not offered during that semester at Mason, and have space available at the consortium institution. Students should consult with the Consortium Coordinator in the Registrar’s Office, as additional restrictions may apply. Students may take just one course per semester, with a career maximum of two courses. 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.

Credit to Be Earned at Other Institutions

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.

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 can seldom be approved. Courses offered at Consortium Universities must be reviewed by the Consortium Coordinator in advance and will not be considered for general 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 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 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:

- Have a cumulative GPA of 2.25 or higher at Mason
- Have completed the immediately preceding semester at Mason with a 2.00 or higher
- Have completed the necessary forms and have obtained all required signatures and course equivalencies

The Center for Global Education (globaled.gmu.edu/index.html) 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.

**Academic Clemency**

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 exception, 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 in writing by the last day of classes for their first semester back at George Mason
- In order to make this request, students should (a) enroll in at least 6 hours during their first semester back at George Mason and (b) earn at least a 2.50 semester GPA with no grade below “C.” If these minimum academic requirements are not met during the first semester of return, then clemency will not be allowed under any circumstances

Additional information about clemency can be found at www.gmu.edu/student/academicaffairs/policies.htm.

**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 Undergraduate Programs. 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 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 Undergraduate Programs is the final level of appeal for COS college level requirements, retroactive adds, withdrawals, graduation, and return from suspension and dismissal. The Associate Dean 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.
Grievances

Grievances should be directed in writing to the Associate Dean for Undergraduate Programs. 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) with a curriculum grade point average (GPA) of at least 2.75 are considered to have met all of George Mason University’s lower level general education requirements. They are still required by the university to complete ENGL 302 and a synthesis course. Transfer students who meet the conditions above and are pursuing a degree in COS 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.

Excluded Courses

Physical Education (PHED) and Parks, Recreation, and Leisure Studies (PRLS) activity courses cannot be counted toward credits required for a degree in the College of Science. Students may use nonactivity PHED and PRLS courses for elective credit for college degrees. For a current list of PHED and PRLS courses that may be used for credit in the college, see the CHSS Undergraduate Academic Affairs Office Web site at http://www.gmu.edu/student/academicaffairs/. Military Science (MLSC) courses cannot be counted toward credits required for a degree in the college.

Once admitted to Mason, students may not take CLEP exams and apply credits from those exams to degrees in the College of Science. Students may apply credits from CLEP exams to degrees in the college only if those credits were awarded at the time of admission.

Atmospheric, Oceanic and Earth Sciences

Phone: 703-993-8958
Web: aoes.gmu.edu

Faculty

Professors: Diecchio, Hazen (Robinson Professor), Schneider, Schopf, Shukla (chair), Straus

Associate professors: DelSole, Harlan, Huang, Kinter, Klinger, McBride

Assistant professors: Jin, Kysar-Mattietti

Contract professor: Doty, Krishnamurthy, Nord-Cooper, Verardo

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 or BIOL 307, 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 307 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 the following courses with an average GPA of 3.50 or better: GEOL 406, 410, and 411.

■ Bioinformatics and Computational Biology

Phone: 703-993-8400
Web: bioinformatics.gmu.edu

Faculty

Professors: Grefenstette, Jafri (chair), Willett
Associate professors: Kinser, Klimov, Seto, Vaisman
Contract assistant professor: Solka

Course Work

The department offers all course work designated BINF in the Courses chapter of this catalog.

■ Biology Undergraduate Program

Phone: 703-993-1050
Web: biology.gmu.edu

Faculty

Director: Rockwood
Assistant Director: Beck
Professors: Rockwood
Term associate professors: Beck, Cressey, Polayes
Term assistant professors: Coss, Fondue, Kocache, Madden, Otto, Polayes
Adjunct faculty: Henley, Jones, Kaminski, Laemmerzahl, McClintock, Oaks, Tondi, Wood-Salvesen

The Biology Undergraduate Program is a collaboration between the Department of Molecular and Microbiology (MMB) 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 MMB Department 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 contacting the Biology Program office, David J. King Hall, Room 3005, 703-993-1050.

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. Call 703-993-1050 or visit David J. King Hall, Room 3005, to make an advising appointment.

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 3.50 or better
• GPA in supporting requirements (math and other science) must be 3.00 or better
• Grade of B or better in Biol 213

Ideally, we would like to recruit students in their freshman or sophomore year.

Retention Requirements

Students in honors biology must maintain a biology GPA of 3.50 or better and a supporting GPA of 3.00 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 7 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 3.50 GPA in honors biology courses
• Minimum 3.50 GPA in biology requirements
• Minimum 3.00 GPA in supporting requirements
• Minimum 3.00 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 medical technology fulfill this requirement by successfully completing BIOL 453. Students not taking BIOL 453 at Mason should consult the program director for a course to fulfill this requirement.

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. Professional study during the senior year involves clinical education at an affiliated school of medical technology. Thirty credits of course work are required, including MTCH 401, 402, 403, 404, 405, and 406. 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.

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 and then take one of the following to complete the requirement: BIOL 303, 304, or 305/306. Chemistry, physics, and mathematics majors should consult their faculty advisor to determine which biology courses to take.

Medical Laboratory Technician Articulation Program

A special program is available for Medical Laboratory Technicians (MLTs) who are graduates of associate degree programs. This program provides substantial credit for the scientific and clinical aspects of the associate degree but requires students to meet clinical requirements for national certifying exams through approved work experience. For details, contact the program director.

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, 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 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.

■ Chemistry and Biochemistry

Phone: 703-993-1070
Web: chemistry.gmu.edu

Faculty

Professors: Cozzens, Davies, Foster (chair), Mose, Mushrush

Associate professors: Born, Honeychuck, Hussam, Schreifels, Slayden, Weatherspoon (associate chair)

Term associate professor: Hatton

Assistant professors: Bishop, Cooper, Couch

Term assistant professors: Kort, 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, 337, 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 degrees in environmental science and policy, bioscience, and physical sciences. An area of emphasis in computational chemistry is available through the PhD in computational sciences and informatics program offered in conjunction with the Department of Computational and Data 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 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.

■ Computational and Data Sciences

Phone: 703-993-3807
Web: cds.gmu.edu

Faculty


Associate professors: Axtell*, Borne, Cebral, Klimov*, Wallin, C. Yang, R. Yang*, Zoltek

Assistant professors: Camelli, Griva, Opher*, Sheng, Tollaksen, Weigel, Zhang

Research professors: Bilitza, Dere, Economou, Gomez, Poland, Titarchuk

Adjuncts: Guharay, Lanzagorta, Veytsman

*Faculty holding primary appointments in other departments.

Course Work
The department offers all course work designated CDS, CSI, CSS, and NANO in the Courses chapter of this catalog.

# Environmental Science and Policy

Phone: 703-993-1043  
Web: esp.gmu.edu

## Faculty

**Professors**: Jones, Lawrey  
**Term professor**: Talbot  
**Associate professors**: Balint, Birchard, Gillevet, Jonas (Chair), Macfarlane, McBride, Rockwood, Torzilli  
**Assistant professors**: Ahn, Crate, Darnall, Edwards, Forkner, Kraus, Manca, Weeks  
**Term associate professors**: Cressey, Parsons, Sklarew  
**Term assistant professors**: Largen, Peters  
**Research associate professor**: Litchfield  
**Emeritus professors**: Bradley, Ernst, Kelso, Shaffer, Skog

## Other Environmental Program Faculty

**Professors**: Black, Chandhoke, Conlan, Diecchio, Foster, Gifford, Haack, Houck, Mose, Mushrush, Nadeau, Regan, Rowan, Sage, Schum, Wan, Willett, Wong  
**Associate professors**: Beach, Christensen, Conant, deMonsabert, Fryxell, Guagnano, Honeychuck, Kozlowski, Mahler, McBride, Meyer, Paden, Palkovich, Rodgers, Royt, Seto, Stough, Wood  
**Assistant professor**: Kysar-Mattietti, Parker  
**Term associate professors**: Verardo  
**Term assistant professors**: Nord-Cooper  
**Affiliate faculty**: Bailey, Bartoldus, Baxter, Buchino, Burgess, Creque, Croisier, Hamdan, Jordan, Kriechevsky, Lebovitz, Leimgrubcr, Litchfield, Maldini, Maldonado, Marra, Maurakis, May-Collado, Megonigal, Noe, Oren, Ragen, Rybicki, Seidensticker, Sillett, Sladen, Smith, Songsasen, Strong, Wang

## 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 Concentration in Environmental Science (EVSC) within the BS in Earth Science degree program is offered by Environmental Science and Policy jointly with the Department of Atmospheric, Oceanic and Earth Sciences. It is intended for students interested in studying the earth and its environment. Refer to to AOES section for more information on the Earth Science, BS degree program and this concentration.

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.

■ Forensic Science Program

Phone: 703-993-1050
Web: cos.gmu.edu/forensics

Faculty

Director: Whildin
The Forensic Science Program is an interdisciplinary academic collaboration between the Department of Chemistry and Biochemistry; the Department of Molecular and Microbiology (MMB); the Department of Environmental Science and Policy (ESP); and the Department of Bioinformatics and Computational Biology (BCB). 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 undergraduate minor in Forensic Science.

Graduate Degree Programs

The Forensic Science Program oversees the MS and Graduate Certificate programs in Forensic Science.

Geography and Geoinformation Science

Phone: 703-993-1210 or 703-993-1212
Web: ggs.gmu.edu

Faculty

Professors: Agouris, Di, Falconer, Haack, Taylor, Waters, Wong

Associate professors: Beach, Chiu, Curtin, Houser, Qu, Stefanidis, R. Yang

Assistant professors: Cervone, Kronenfeld, Leslie, Manca, Rice, Sun, C. Yang, W. Yang, Zolnik

Research or contract professors: Gomez, Pilon, Self

Term instructors: Boudinot, Halliden

Course Work

This department offers all courses designated EOS and GEOG 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 GEOG 415. Students majoring in Global and Environmental Change fulfill this requirement by successfully completing EOS 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.

Mathematical Sciences

Phone: 703-993-1460
Web: math.gmu.edu

Faculty

Professors: Alligood, Colonna, Fischer (chair), Kulesza, B. Lawrence, J. Lawrence, Levy, Morris, Polyak, Sachs, Saperstone, Sauer (COS Distinguished Scholar), Shapiro (undergraduate coordinator), Singman, Soltan, Walnut (graduate coordinator)

Associate professors: Agnarsson, Anderson, Gabel, Goldin, Kiley, Lamba, Lim, Lin, Sander, Seshaiyer, Wanner, Zoltek

Assistant professors: Emelianenko, Griva, Napoletani

Adjuncts: Crain, Gill, Lightbourne, Morris, Morse, Moumen, Nefessi, Roberts, Shaw, Wallace, Yazigi, Zampedro

Admin professional: O’Brien

Term instructors: Crossin, Goldman, Granfield, Matveev, Nuttall, O’Beirne

Affiliates: Loustaunau

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). 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) 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, 106, 108, 110, 111, 112, or 125.

Honors Program in Mathematics

Mathematics majors who have maintained a GPA of at least 3.5 in Mathematics courses and a GPA of 3.5 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 3.5 in mathematics courses and successfully complete MATH 405 and 406 with an average GPA of at least 3.5 in these two courses.

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.

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).
Students must complete 18 credits as follows: CTCH 602, 603, 604 or 605 (or equivalents with a specific disciplinary focus), 685, and 6 credits of CTCH electives, approved by the program director for higher education. 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.

■ **Molecular and Microbiology**

Phone: 703-993-4263  
Web: gmu.edu/departments/mmb

**Faculty**

**Chair:** Willett  
**Professors:** Bailey (distinguished), Liotta, Petricoin, Popov, Soyfer (distinguished university), Willett  
**Associate professors:** Baranova, Christensen, Fryxell, Grant, Royt  
**Assistant professors:** Cox, van Hoek, Wu  
**Term assistant professors:** Beck (associate chair), Coss, Fondufe, Fox, Jarrar, Kocache, Madden, Otto, Polayes  
**Adjunct faculty:** Baker, McClintock, Pitt, Tondi  
**Emeritus:** Isbister

**Course Work**

The department offers all course work designated BIOL, BIOS, and MTCH in the Courses chapter of this catalog.

**Other Undergraduate Programs**

The Molecular and Microbiology department works closely with and provides administrative input 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 bachelors degrees in Biology.

**Policy on Using Departmental Laboratories**

Only authorized experiments and exercises may be carried out in any departmental 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.

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.

■ Neuroscience Program

Phone: 703-993-4333
Web: gmu.edu/departments/neuroscience

Faculty

Director: Jafri

Professors: Ascoli, Butler, Jafri, Olds, Smith, McCabe, Parasuraman

Associate professors: Blackwell, Cebral, Flinn, Fryxell, Greenwood, Houser, Kello, Klimov, Peterson, Sander, So

Assistant professors: Barreto, Cox, Dumas, Kabbani, Kalbfleisch, Kochevnikov, 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, biochemistry, 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
• cellular organization and connections of sensory processing areas in fish
• 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.

■ Physics and Astronomy

Phone: 703-993-1280
Web: www.physics.gmu.edu

Faculty

Professors: Becker*, Blaisten-Barojas*, Dworzecka, Ehrlich (chair), Ellsworth, Lieb, Mishin, Satija, Summers, Trefil

Associate professors: Barreto, Ceperley, Opher, Rubin, Satyapal, Sauer, So, Wallin*, Weingartner

Assistant professors: Cressman, Rosenberg, Tian, Weigel*, Zhang*

Term associate professor: Goldman, Oerter

Term assistant professors: Geller, Iacoletti, Jazaeri, Wyczalkowski

Term instructors: Ericson, Ewell

Emeriti: Ceperley, Evans, Mieleczarek

Research faculty: Duxbury, Gliozzi, Meier, Poland, Richards

*These guest faculty hold primary appointments in other departments.

Course Work

The Physics and Astronomy Department offers all course work designated ASTR and PHYS in the Courses chapter of this catalog.

Honors Program in Physics

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 departmental 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.

**Honors Program in Astronomy**

Astronomy majors who have completed the prerequisites for ASTR 405 Honors Thesis in Astronomy, have a GPA of at least 3.5 in ASTR and PHYS courses taken at GMU, and have a GPA of at least 3.5 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 3.5 in their ASTR/PHYS courses. Students accepted into the honors program must complete ASTR 405 and 406 with a GPA of at least 3.5 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.

**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 Physics and Astronomy Department. Those students are required to take at least 4 additional credits in approved physics courses.

**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.

**Research Opportunities**

The department offers many opportunities for undergraduate students to get involved with research. Students should consult with faculty working on research of interest to them, based on their examination of the Physics Department web site.

**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, 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.
College of Visual and Performing Arts

Performing Arts Building, Room A407
Phone: 703-993-4551
Web: gmu.edu/cvpa
College Code: AR

Departments

Art and Visual Technology
Dance
Music
Theater

Additional Academic Units

Art Education
Arts Management
Computer Game Design
Film and Video Studies

“Mason is deeply committed to the arts and educating our students about the significance the arts have in all our lives. This is why the arts are integral to our institution. We encourage active student participation in the many programs and related courses in the arts that are scheduled throughout the year. Students are able to receive a more balanced education, develop a deeper appreciation of the arts, and achieve a more enlightened perspective of the world.”

—Alan G. Merten
President, George Mason University

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, which comprises 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, 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, TheaterSpace, the Fine Arts 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
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
Jean Kellogg, Executive Director, Hylton Performing Arts Center
Victoria N. Salmon, Assistant Dean, Graduate Studies
Scott Martin, Assistant Dean, Research, Technology
Rick Davis, Artistic Director, Center for the Arts and Co-Artistic Director, Theater of the First Amendment

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.” All entering students who have not yet satisfied the university-wide requirement in quantitative reasoning are required to take the math placement test prior to enrollment.

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

Students are ultimately responsible for their academic progress towards their degrees. 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 should contact the CVPA Academic Affairs Office (Performing Arts Building, A407; 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.

Accomodations 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.

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 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 nonactivity PHED courses for elective credit for CVPA degrees.

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.

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.

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.
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 University Registrar's Office 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 Associate Dean for Academic Affairs reviews all undergraduate appeals, and the Assistant Dean for Graduate Programs reviews all graduate appeals.

The Decision of the CVPA Associate Dean (undergraduate students), or Assistant Dean (graduate students) 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 Associate Dean for Academic Affairs reviews all undergraduate appeals, and the Assistant 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 Associate Dean for Academic Affairs reviews all non-academic appeals and grievances.

Academic Dismissal from a Graduate Program:

The Registrar's Office 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.
4. The CVPA Assistant Dean for Graduate Programs reviews the appeal.
5. The final decision of the CVPA Assistant Dean is forwarded to the student and Registrar's Office.
6. 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.

Art and Visual Technology
Faculty

Harold Linton, Chair

Professors: Carbonneau, Frederick, Kravitz (gallery director), Linton (chair), Mandes, Sandell

Associate professors: Ashcraft (associate chair), Crawford, Feerick, Frenn, White

Assistant professors: Cooley, Cui, Endress, Karametou, Rothstein, Sheridan, Winant (associate chair), Wrbican

Term assistant professors: Constantine, Del Popolo, Malone, Stanley, Starr

Adjunct faculty: Bradley, Bulisova, Carr-Shaffer, Castellana, Chao, Clements, Cushner, DeLuca, Dicicco, Fairfax, Ferreira, Goldman, Gorman, Guerrieri, Herce, Hicks, Ho, Hoffmann, Kerns, Kirk, Nahidian, Organ, Petzwinkler, Rodriguez, Rozario, Sapsford, Serafin, Tomhave, Watson, Wiseman

Mission

The Department of Art and Visual Technology (AVT) 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 AVT 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 Department of Art and Visual Technology offers all course work designated AVT in the Courses chapter of this catalog.

UNDERGRADUATE PROGRAMS

Undergraduate studio degrees offered by the Department of Art and Visual Technology include the bachelor of arts (BA) and the bachelor of fine arts (BFA). The department also offers an undergraduate minor in AVT, an interdisciplinary minor in multimedia, and a departmental 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 department’s art education advisor to learn more about teacher preparation.

All George Mason University students are welcome to enroll in course work in AVT. Consult the course listings for prerequisites.
Admission to AVT Requirements

All students are admitted to AVT programs of study separately from their admission to the university and only by portfolio review. Students may be admitted to study in the BA or BFA program by one of three ways:

- Presenting a portfolio and any other requested credentials at designated portfolio review days before each semester and before applying for admission
- Completing the sequence of AVT 104, 105, and 222 with a 3.25 or higher average in those courses, and applying for admission through a portfolio review
- Completing the sequence of AVT 104, 105, and 222; and 323 or 324; and one other 200-level AVT course with a 3.00 or higher GPA in those courses; and applying for admission through a portfolio review

BFA Portfolio Review

New students at Mason may apply to the BFA program upon admission to the university through a portfolio review. Portfolio reviews are scheduled through periodic Admission Office events, or through scheduled dates designated by the AVT Department. Please call the main office to schedule an appointment (703-993-8898).

For current Mason student in the AVT BA program who wish to change to the BFA program, or other current Mason students, application deadlines are at the end of the sixth week of the fall and spring semester each year. Students planning to apply must meet with the coordinator of their AVT concentration in the semester prior to their application to discuss the portfolio.

For all candidates, admission to the BFA program is highly competitive and requires submission of the following:

For all incoming students:

- Portfolio of 10 to 15 original examples of college-level art work
- One-page, double-spaced essay

In addition, for all transfer students:

- Transcripts of all college-level study
- Must have at least a 3.00 cumulative GPA overall and in the major

Students may alternatively be admitted to study in the BFA program by one of three ways:

- Presenting a portfolio and any other requested credentials at designated portfolio review days before each semester and before applying for admission
- Completing the sequence of AVT 104, 105, and 222 with a 3.25 or higher average in those courses, and applying for admission through a portfolio review
- Completing the sequence of AVT 104, 105, and 222; and 323 or 324; and one other 200-level AVT course with a 3.00 or higher GPA in those courses; and applying for admission through a portfolio review

Students interested in applying should contact the Department of Art and Visual Technology for an application and specific directions on presenting the portfolio.

Artsbus Requirement

All AVT majors must meet the department’s requirement of travel to galleries and museums through the AVT Artsbus program. Students meet this requirement by enrolling in AVT 300 Artsbus Attendance. The procedure and requirements for enrollment in AVT 300 is the same as for any other class.

Freshmen who enroll as AVT majors must take AVT 300 for five semesters. 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.

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 “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 AVT undergraduate students must earn a minimum 2.00 cumulative GPA in their major.

Studios

The Art and Visual Technology program is located in the arts 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.

Studios are open to students for extended periods mornings, evenings, and weekends whenever classes are not in progress. Policies, procedures, and schedules for studio use are established by the AVT studio faculty and are posted in the studios.

AVT Honors Program

Students interested in the Honors Program in Art and Visual Technology should contact the chair of the department. 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.

Academic Policies
Please see College of Visual and Performing Arts academic policies.

**Art Education**

Renee Sandell, Program Director  
Phone: 703-993-8562  
Web: arteducation.gmu.edu

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 practicum experience, and studio work prior to preservice teaching internship and seminar.

**Academic Policies**

Please see College of Visual and Performing Arts academic policies.

**Arts Management**

4260 Chain Bridge Road  
Fairfax, VA 22030  
Phone: 703-993-8926  
Web: artsmanagement.gmu.edu

**Faculty**

Richard Kamenitzer, Program Director

**Professor:** Reeder

**Associate professors:** Brindle, Marcus, Martin

**Term associate professor:** Kamenitzer (program director)

**Adjunct faculty:** Allen, Berardelli, Bienvenu, Case, Coppage, Dawn, Denhardt, Hauptle, Hill, Huschle, Kaiser, Kraft, Lopez, Madden, Murray, Richard, Simpson, Smyers, Thompson

**Course Work**

The Arts Management Program offers all course work designated MAM in the Courses chapter of this catalog.

**Graduate Certificates:**

**Arts Entrepreneurship**
The Arts Entrepreneurship certificate is for early to mid-career professionals working at least tangentially in an arts-related profit or nonprofit business. Participants will augment their existing knowledge by examining innovative case studies, studying advanced practices and processes, and the actual execution of business models.

**Fund Raising and Development in the Arts**

The Fund Raising and Development certificate is especially helpful for mid-career professionals. It focuses on the practical application of development principles, writing and communication skills, and strategic planning.

**Public Relations and Marketing in the Arts**

The Public Relations and Marketing in the Arts certificate focuses on strategic planning, development and implementation of public relations and marketing in arts organization for the beginning and mid-level professional.

**Special Events Management in the Arts**

The Special Events Management in the Arts certificate is for the entry level or mid-level professional to increase their skills in the fast paced and creative field of events management.

**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 23-credit core and then select courses from a cluster: entrepreneurship in the arts and management; finance and budgeting for the arts; marketing and public relations; or an arts-specific cluster. 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 1 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

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.

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**Computer Game Design**

Performing Arts Building, Room A407  
Phone: 703-993-1321  
Web: cvpa.gmu.edu/game-design

**Faculty**

Scott Martin, Program Director

Associate Professor: Martin (program director)

Term Assistant Professor: Wren

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**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.

**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 seeking a BFA in computer game design should speak with the program director about this requirement.

**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 for college academic policies.

■ Dance

Performing Arts Building, Room A300
Phone: 703-993-1114
Web: dance.gmu.edu

Faculty

Elizabeth Price, Chair

Professors: Lepore, Miller, Shields

Associate professors: Price (chair), Studd

Assistant professors: Joyce

Term Assistant Professors: Dinapoli, Fang, Reedy, Willis

Adjunct Faculty: Bush, Clancy, Cronmiller, Goodson, Koucheravy, Lee, Lees, Mattingly, Nuamah, Summerall, Volberg, Windom

Course Work

The Department of Dance offers all course work designated DANC in the Courses chapter of this catalog.

UNDERGRADUATE PROGRAMS

The Dance Department 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 department web page, dance.gmu.edu, or by calling the department 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 ENGL 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 300, 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 300 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 postbaccalaureate semester.

**Academic Policies**

Please see College of Visual and Performing Arts for college academic policies.

**GRADUATE PROGRAM**

The MFA in dance is a 60-credit program of study grounded in the modern dance genre that emphasizes performance, choreography, and teaching in higher education. Candidates are expected to enter the program with significant professional performance at the national or international level, advanced technical proficiency in ballet or modern technique, and professional competence in choreography exemplified by a significant body of work.

**Admission Requirements**

In addition to fulfilling the admission requirements for graduate study, the applicant must submit directly to the Dance Department a résumé and a 10-minute video that illustrates the applicant’s choreography. All candidates must also demonstrate advanced technical proficiency through an audition. Contact the Dance Department at 703-993-1114 for dates and times.

All candidates must satisfy the following prerequisites: advanced dance technique, improvisation, two semesters of dance composition, two semesters of dance history, rhythmic analysis or music for dance, anatomy and kinesiology, and dance production. Prerequisite courses may be completed before or concurrent with graduate course work and 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.

■ **Film and Video Studies**

Performing Arts Building, Room A407
Phone: 703-993-1992
Web: www.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; 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; Richard Kamenitzer, Arts Management; Howard Kurtz, Theater; Alison Landsberg, History and Art History; Scott Martin, Arts Management; Kristina Olsen, Modern and Classical Languages; Paula Petrik, History and Art History; Janine Ricouart, Modern and Classical Languages; Mark Sample, English; Jessica Scarlata, English; 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) now 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.

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.

Academic Policies

Please see College of Visual and Performing Arts for college academic policies.

Music

Performing Arts Building, Room A417
Phone: 703-993-1380
Web: gmu.edu/departments/music

Faculty

James Gardner, Chair
Professors: Camphouse, Carroll, Engebretson, J. Gardner (chair), Maiello, Miller, Monson (associate chair), Smith

Term professor: Balakerskaia, Hearden, Johonnott, Lapple

Associate professors: Billingham, T. Owens

Term associate professors: Casagrande, Ker-Hackleman, Rendler

Assistant professors: Bergman, Guessford, Nickens, Novak, Robinson

Adjunct Faculty: Beach, Beckwith, Behrend, Berkshire-Brown, Berger, Conlon, Crabill, East, Gerber, Haroutounian, Healey, Hughes, Kilkenny, McCarthy, M. Owens, Parrell, Rittenhouse, Roberts, Snitzler, Stephansky, Sternbach, Taylor, von Villas, Watters, Wenner

Course Work

The Music Department offers all course work designated MUSI in the Courses chapter of this catalog.

UNDERGRADUATE PROGRAMS

The two undergraduate degree programs offered through the Department 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 department enables students to pursue worthwhile vocational goals as teachers, performers, conductors, and composers. The department 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 department 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 department 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 department 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 Department of Music before the scheduled audition date. Auditions are held approximately once per month. Audition dates and audition application forms are available through the music department web site: gmu.edu/departments/music.

A fundamentals of music test is given during the first week of classes to all students enrolled in MUSI 115 Theory I. Call the Department 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: sight singing, ear training, 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 PROGRAMS

The PhD in music education and the doctor of musical arts degree require 60 credits beyond the master’s degree 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.

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 (single or multiple instruments), music education, composition, conducting, and pedagogy and performance. The MM with a concentration in music education does not provide licensure to teach music in public or private schools.
PhD in Music Education (pending SCHEV approval)

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 (pending SCHEV approval)

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. DMA graduates are qualified to teach music at the college or university level, as well as K–12.

Academic Policies

Please see College of Visual and Performing Arts academic policies.

■ Theater

Performing Arts Building, Room A407  
Phone: 703-993-1120  
Web: gmu.edu/departments/theater

Faculty

Clayton Austin, Chair  
Professors: D’Andrea (Robinson professor), Davis  
Associate professors: Austin, Elston, Gero, Johnsen-Neshati, Kurtz, McDonald  
Term associate professor: Chew  
Adjunct Faculty: Cetron, Lechter, Lee, 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 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. 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 elect a course of study that includes classes in at least two of three areas: performance, design and technical theater, and 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 including foreign language. Students must earn a minimum 2.00 cumulative GPA in their major.

**Theater Concentrations**

Theater majors may apply to complete their degree in one of the following concentrations: Design and Technical Theater, Performance, Playwriting and Dramaturgy, or Theater Studies.

To apply for admission into a concentration a student must have:

- completed 45 credits including THR credits as specified in the concentration
- cumulative GPA minimum of 2.5

**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 351.

**Honors in Theatre**

Students wishing to pursue Honors in Theater should contact the department chair.

**Production Opportunities**

Participation in Theater Department productions with the GMU Players is expected of all declared majors. Up to 4 practicum credits, 1 credit per assignment can be awarded for satisfactory completion of performance and production assignments in the major, including faculty or guest-directed GMU Players main stage, studio, or Theater of the First Amendment (TFA) productions.

TFA, a professional theater in residence within CVPA, offers students the chance to work closely with professional artists. TFA productions regularly employ student assistants in stage management, directing, design, dramaturgy, technical crews, and production and company management. Students are eligible to audition for age-appropriate roles or understudy assignments in TFA productions and may participate in the Membership Candidate Program through the Actors’ Equity Association.

**Academic Policies**

Please see College of Visual and Performing Arts academic policies.

**The Volgenau School of Information Technology and Engineering**
The mission of the Volgenau School of IT & 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 Information Technology and 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 several degree programs that concentrate on important contemporary technological issues and needs. Bachelor’s degree programs are offered in the areas of applied computer science, civil and infrastructure engineering, computer engineering, computer science, electrical engineering, 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, computer engineering, computer forensics, computer science, electrical engineering, information security and assurance, information systems, operations research, software engineering, statistical science, systems engineering, and telecommunications. 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.

Undergraduate certificates are offered in applied statistics, information technology, postbachelor computer science, and operations research and engineering. For graduate students, certificate programs are offered in advanced network protocols for telecommunications; architecture-based systems engineering; biometrics; e-commerce; command, control, communications, computing, and intelligence; intelligent agents; communications and networking; computational modeling; systems engineering of software intensive systems; federal statistics; biostatistics; information engineering; information security and assurance; military operations research; signal processing; software engineering; telecommunications forensics and security; networks, systems integration and testing; very-large-scale-integration (VLSI) design and manufacturing; civil infrastructure and security engineering; discovery, design, and innovation; computer networking; network technologies and applications; wireless communications; telecommunications systems modeling; data mining; database management; and web-based software engineering.

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, 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. The bachelor of individualized study (BIS) degree program may appeal to adult students who have completed a substantial portion of their studies at other institutions.

Bioengineering has been increasingly represented at the Volgenau School. New faculty members are working with other departments, schools, and institutes at Mason to provide a quality education to students interested in this rapidly growing field. The faculty at the Volgenau School hopes to work with numerous Washington-area organizations dedicated to health oriented research or clinical service.

**Administration**

Lloyd Griffiths, Dean  
Daniel A. Menascé, Senior Associate Dean  
E. Bernard White, Associate Dean for Undergraduate Studies  
Sharon Caraballo, Assistant Dean for Academic Affairs  
Jennifer Lamb, Assistant Dean for Development  
Melinda Barnhart, Executive Director, Finance and Administration  
Pete Farrell, Director, Business Development  
Jonathan Goldman, Director, Computing Resources  
Terri Mancini, Director, Sponsored Research Administration  
Lisa Nolder, Director, Graduate Student Services  
Nicole Sealey, Director, Graduate Admissions and Enrollment Management

**Bachelor of Science Programs**

The Volgenau School offers seven programs in its academic units. Policies regarding admission and degree requirements 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>
</tr>
<tr>
<td>Civil and Infrastructure Engineering</td>
<td>CEIE</td>
</tr>
<tr>
<td>Computer Engineering</td>
<td>ECE</td>
</tr>
<tr>
<td>Computer Science</td>
<td>CS</td>
</tr>
<tr>
<td>Electrical Engineering</td>
<td>ECE</td>
</tr>
<tr>
<td>Information Technology</td>
<td>AIT</td>
</tr>
<tr>
<td>Systems Engineering</td>
<td>SEOR</td>
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</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

Freshmen who are undecided about their specific majors may select Volgenau School undeclared as their major. 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.

The requirements for the BIS degree can be found in the College of Humanities and Social Sciences chapter. Requirements for the applied computer science, civil and infrastructure engineering, computer engineering, computer science, electrical engineering, IT, and systems engineering undergraduate degree programs are provided in the academic departments’ sections of this chapter.

**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. That chapter also lists additional university requirements for minor programs and additional (double) majors.

**Academic Progression, Course Repeat**

Students majoring in the Volgenau School programs are expected to have an acceptable plan of study formulated with assistance from the department advisor on file. They are expected to make reasonable progress toward their degree during each semester they are enrolled. Undergraduate students may be required to obtain permission from the Volgenau School Student Services Office to repeat some courses required for the major in which they have previously received a grade of D or F. Individual Volgenau School programs may disallow students from retaking 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 are 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 departments. 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. The respective computer science or engineering student’s department might approve requests for some IT courses, such as IT 350, 362, 462, and 466, to satisfy degree requirements. For more information, contact the department or the Volgenau School Student Services Office at 703-993-1511.

**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 15 master of science programs in its academic units. Policies regarding admission and degree requirements are provided in the department sections that follow.

<table>
<thead>
<tr>
<th>MS Degree</th>
<th>Department</th>
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<tbody>
<tr>
<td>Applied Information Technology</td>
<td>AIT</td>
</tr>
<tr>
<td>Civil and Infrastructure Engineering</td>
<td>CEIE</td>
</tr>
<tr>
<td>Computer Engineering</td>
<td>ECE</td>
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<tr>
<td>Computer Forensics</td>
<td>ECE</td>
</tr>
<tr>
<td>Computer Science</td>
<td>CS</td>
</tr>
<tr>
<td>Electrical Engineering</td>
<td>ECE</td>
</tr>
<tr>
<td>Epidemiology and Biostatistics</td>
<td>STAT</td>
</tr>
<tr>
<td>Information Security and Assurance</td>
<td>CS</td>
</tr>
<tr>
<td>Information Systems</td>
<td>CS</td>
</tr>
<tr>
<td>Operations Research</td>
<td>SEOR</td>
</tr>
<tr>
<td>Real Estate Development</td>
<td>CEIE</td>
</tr>
<tr>
<td>Software Engineering</td>
<td>CS</td>
</tr>
<tr>
<td>Statistical Science</td>
<td>STAT</td>
</tr>
<tr>
<td>Systems Engineering</td>
<td>SEOR</td>
</tr>
<tr>
<td>Telecommunications</td>
<td>ECE</td>
</tr>
</tbody>
</table>

Doctor of Philosophy Programs

The Volgenau School offers 5 PhD programs in 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 15
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>PhD Degree</th>
<th>Department</th>
</tr>
</thead>
<tbody>
<tr>
<td>Civil and Infrastructure Engineering pending SCHEV approval</td>
<td>CEIE</td>
</tr>
<tr>
<td>Computer Science</td>
<td>CS</td>
</tr>
<tr>
<td>Electrical and Computer Engineering</td>
<td>ECE</td>
</tr>
<tr>
<td>Information Technology</td>
<td>Interdisciplinary</td>
</tr>
<tr>
<td>Statistical Science</td>
<td>STAT</td>
</tr>
<tr>
<td>Systems Engineering and Operations Research</td>
<td>SEOR</td>
</tr>
</tbody>
</table>

**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. Students who are awarded an engineer degree will be able, at a later date, to work toward a PhD in information technology. Details about the engineer degree can be found in the Interdisciplinary Programs section of this chapter.

**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. Courses from the other institutions may be offered at Mason’s Fairfax or Prince William campuses. For more information, go to volgenau.gmu.edu/graduates/commonwealth_graduate_engineering.php.

**Applied Information Technology**

Phone: 703-993-3565  
Web: ait.gmu.edu  

School: The Volgenau School of Information Technology and Engineering

**Faculty**

Professors: Gantz (chair), Jajodia, Marchant  
Associate professor: Snow (associate chair)  
Assistant professors: Aksoy, Boicu, Bruno, Rytikova, Wang
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, technical and leadership skills.

The BS in 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 number of certificate programs 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 500/600 level IT courses in the Courses chapter of this catalog.

Civil, Environmental, and Infrastructure Engineering

Phone: 703-993-1675
Web: civil.gmu.edu

School: The Volgenau School of Information Technology and Engineering

Faculty

Professors: Arciszewski, Bronzini (chair), Houck

Associate professors: deMonsabert, Flannery, Venigalla

Assistant professors: Casey, Urgessa

Research professor: Hero

Adjunct professors: Adler, Ali, Bhargava, Binning, Chase, Chipley, Choudhury, Donahue, Doyle, Gagne, Goode, Hartmann, Harrop-Williams, Matusik, McDaniel, Miller, Rodriguez, Suydam, Ward, Zobel

The Civil, Environmental, and Infrastructure Engineering (CEIE) Department offers a BS and an MS in civil and infrastructure engineering. These degree programs complement the study of civil and environmental engineering with advances in information technology (IT), and they 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 the Accreditation Board for Engineering and Technology, 111 Market Place, Suite 1050, Baltimore, Maryland 21202-4012; 410-347-7700. Students interested in pursuing doctoral education in civil and infrastructure engineering are encouraged to read the sections on the interdisciplinary PhD in information technology and PhD study in civil and infrastructure engineering.
Civil and infrastructure engineering is the study of land, transportation, water, environmental, structural, energy, and telecommunications systems 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 such as the Washington, D.C., metropolitan area.

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 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 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 and some of the ENGR and IT courses in the Courses chapter of this catalog.

■ Computer Science

Phone: 703-993-1530
Web: cs.gmu.edu

School: The Volgenau School of Information Technology and Engineering

Faculty

Professors: Barbara, J. Chen, DeJong, Gomaa (chair), Kerschberg, Menascé, Motro, Offutt, Pullen, Sibley, Sood, Tecuci, Wechsler


Assistant professors: S. Chen, Li, Lien, Lin, T. Maddox, Malek, Rangwala, Shehu, Sousa, Stavrou, X. Wang, Zhong

Instructors: Fleck, Heishman, Nordstrom

Adjunct professors: Abdurazik, Ahmed, Alazzawe, Armour, Baldo, Dean, Ellis, Foxwell, Geldon, Gravatt, Howard, Hwang, Kakarlamudi, Kodali, M. Maddox, Martin, Masiyoswski, Nidiffer, Olimpiew, Pettit, Ritchey, Scoggins, Sharif, Smeltzer, Smith

Emeritus faculty: Baum, Hamburger, Rine

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, astroinformatics, 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 such as e-mail, wireless networking, online group gaming, social networks, 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, as well as some IT courses, 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 elect 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.

■ Electrical and Computer Engineering

Phone: 703-993-1569  
Web: ece.gmu.edu

School: The Volgenau School of Information Technology and Engineering

Faculty

Professors: Allnutt, Cook, Ephraim, Gertler, Griffiths, Ioannou, Jabbari, Levis, Manitius (chair), Mulpuri

Associate professors: Berry, Chang, Gaj, Hintz, Mark, Pachowicz, Paris, W. Sutton, Wage

Assistant professors: Hwang, Ikonomidou, Kaps, Li, Nelson, Peixoto, Sikdar

Research professors: Katona, Wagenhals, Zaidi

Instructor: Pandula

Adjunct professors: Abgariah, Allen, Alper, Beatty, Bollino, Brooks, Follendore, Fowler, Gong, Hibey, Hockensmith, Hrnjez, Lazarevich, Leaf, Lorie, Osgood, Sabzevari, 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 in engineering 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 and electrical engineering, and certificates in communications and networking, signal processing, and very large-scale integration design and manufacturing. The PhD in information technology is offered by The Volgenau School and includes a number of courses with an electrical engineering or computer engineering emphasis. Details about these programs are available at ite.gmu.edu.

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 and microelectronics. The department recognizes the need to augment and enhance these areas through the use of modern IT. Graduate students are offered a progressive environment with ample opportunities for the type of advanced engineering 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, BENG and CRFS in the Courses chapter of this catalog. The department also offers most of the courses designated TCOM and some ENGR and IT courses.

■ Interdisciplinary Programs (VSITE)

School: The Volgenau School of Information Technology and 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.

■ Statistics

Phone: 703-993-3645
Web: statistics.gmu.edu

School: The Volgenau School of Information Technology and Engineering

Faculty
Professors: Carr, Gentle, Rosenberger (chair), Wegman

Associate professors: Bell, Davis (associate chair), Miller, C. Sutton

Assistant professors: Diao, Tang

Instructors: Sims (visiting), 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 an undergraduate certificate program in applied statistics and a minor in data analysis. Also, a variety of advanced undergraduate courses is available for inclusion in other degree programs.

Systems Engineering and Operations Research

Phone: 703-993-1670
Web: seor.gmu.edu

School: The Volgenau School of Information Technology and Engineering

Faculty

Professors: Adelman, Chang, Chen, Donohue, Hoffman, Nash, Polyak, Schum, Sage, Sofer (chair)

Associate professors: Brouse, Laskey, Loerch, Shortle, Speller, White

Assistant professors: Ganesan, Liu

Affiliated faculty members: Houck, VanTrees

Research and term professors: Costa, Gross, Sherry, Wagenhals, Wagner, Wolman

Adjunct professors: Alexander, Barry, Camp, Carley, Durbin, Fischer, Humphrey, Killam, Laveson, McDevitt, Rothwell, Soller, Stephenson, Wieland, Yost
Emeritus faculty: 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, master’s degrees in systems engineering and in operations research, and a PhD degree in systems engineering and operations research. In addition, the department offers five certificate programs at the master’s level: architecture-based systems engineering; command, control, communications, computing, and intelligence (C4I); military operations research; computational modeling; 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 for an organization to use all of a given 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, automobiles, intelligent robots, stereos, 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.

Operations research is the professional field that deals with using scientific methods in engineering and 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 operations research faculty members are principally involved in the theoretical and empirical study of managerial and operational processes, and the use of mathematical and computer models to optimize these systems. Models are needed for a variety of decision-making purposes in business, industry, scientific research, and government to describe different environments and relate alternative plans of action. Thus, the courses in operations research focus on quantitative modeling and the analysis of complex systems. Courses stress the use of contemporary computer hardware and software in modeling and analysis. The Bureau of Labor Statistics predicts that the field of operations research will be one of the fastest-growing professions of the next decade.

Obviously, 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.
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
Institute for Conflict Analysis and Resolution

Phone: 703-993-1300
Web: icar.gmu.edu
College Code: CA

Administration

Andrea Bartoli, Director
Julie Shedd, Associate Director for Administration
Sandra Cheldelin, PHD Program Coordinator
Mark Goodale, MS Program Coordinator
Mara Schoeny, Graduate Certificate Program Director
Agnieszka Paczynska, Undergraduate Program Director

Faculty

Professors: Avruch, Cheldelin, Gopin, Jeong, Rothbart, Rubenstein, Sandole

Associate professors: Bartoli, Cobb, Hirsch, Lyons, Paczynska, Warfield

Assistant professors: Goodale, Maulden, Nan, Schoeny, Simmons

Research professors: Korostelina, Price, Sluzki

Affiliate faculty: Dale, Dukes

Emeritus faculty: Mitchell

Course Work

The Institute for Conflict Analysis and Resolution (ICAR) 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: icarinfo@gmu.edu  
Location: Arlington Campus

Sandra Cheldelin, PHD Program Coordinator

Mark Goodale, MS Program Coordinator

The Ph.D. 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 M.S. 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 ICAR. 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 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.

**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.
Undergraduate Degree

Conflict Analysis and Resolution, BA

Banner Code: CA-BA-CONF

Students must fulfill all requirements for bachelor's degrees including university general education requirements. Students majoring in CAR must also complete the College of Humanities and Social Sciences (CHSS) college-level requirements for philosophy or religious studies, foreign language proficiency, social sciences, and non-Western culture as well as 39 major requirement credits for the BA degree.

Students pursuing a double major/degree with a program outside of the ICAR 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

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 a 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 CAR. Students may use nonactivity PHED courses for elective credit for CAR degrees.

Degree Requirements

Required core courses (15 credits):

- CONF 101 - Conflict and Our World Credits: 3
- CONF 300 - Conflict Resolution Techniques and Practice Credits: 3
- CONF 301 - Research and Inquiry in Conflict Resolution Credits: 3
- CONF 302 - Identity Conflicts and their Resolution 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. Students register for internship credits through New Century College. More information is available at http://ncc.gmu.edu. Students interested in study abroad should register through the Center for Global Education. More information can be found at http://www.gmu.edu/departments/cge. Prior approval by the major advisor is required for all field experience options.

Internship/Service Learning:

• NCLC 390 - Internship Credits: 1-6
• NCLC 490 - Internship Credits: 1-6
• CONF 375 - Special Programs Field Experience Credits: 1-6
• NCLC 395 - Field-Based Work Credits: 1-15
• NCLC 495 - Field-Based Work Credits: 1-15

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 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:

• ADJ 302 - Delinquency Credits: 3
• ADJ 404 - Crime Victims and Victimization Credits: 3
• ADJ 406 - Family Law and the Justice System Credits: 3
• 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 305 - Foundations of Intercultural Communication Credits: 3
• CONF 202 - 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
• CONF 495 - Organizations and Actors in the Conflict Field Credits: 3
NCLC 305 - Conflict Resolution and Transformation Credits: 6
NCLC 310 - Violence and Gender Credits: 3-15
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: 3-15
PHIL 309 - Bioethics Credits: 3
PHIL 355 - Theories of Ethics Credits: 3
PSYC 231 - Social Psychology Credits: 3
PSYC 321 - Counseling Psychology Credits: 3
PSYC 324 - Personality Theory Credits: 3
PSYC 467 - The Psychology of Working in Groups and Teams Credits: 3
SOCI 300 - Social Control and Human Freedom Credits: 3
SOCI 302 - Sociology of Delinquency Credits: 3
SOCI 305 - Sociology of Small Groups Credits: 3
SOCI 309 - Marriage, Families, and Intimate Life Credits: 3
SOCI 350 - Community, Diversity, and Democracy: A Practicum Credits: 3
SOCW 323 - Human Behavior in the Social Environment I Credits: 3

▲ Concentration in Community and Organizational Conflict (MEZZ)

Students choose four courses from the following areas:

- ADJ 302 - Delinquency Credits: 3
- ADJ 406 - Family Law and the Justice System Credits: 3
- ADJ 407 - Law and Society Credits: 3
- ANTH 310 - Social Organization and Kinship Credits: 3
- ANTH 365 - Race and Racism Credits: 3
- ANTH 488 - Gender, Sexuality, and Culture 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
- CONF 202 - Dialogue and Difference Credits: 3
- CONF 240 - 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
- CONF 495 - Organizations and Actors in the Conflict Field Credits: 3
- ECON 309 - Economic Problems and Public Policies Credits: 3
- ECON 320 - Labor Problems Credits: 3
- GEOG 306 - Urban Geography Credits: 3
- GEOG 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 365 - State and Regional Public Policy Credits: 3
- GOVT 414 - Politics of Race and Gender Credits: 3
- HIST 340 - History of American Racial Thought Credits: 3
• HIST 350 - U.S. Women's History Credits: 3
• HIST 418 - Ethnic Groups in America Credits: 3

• MGMT 301 - Managing People and Organizations Credits: 3
or
• MSOM 301 - Managing People and Organizations Credits: 3

• MGMT 412 - Diversity in Organizations Credits: 3
• MGMT 463 - Negotiations in Organizations Credits: 3
• NCLC 301 - Science in the News Credits: 3
• NCLC 304 - Social Movements and Community Activism Credits: 4
• NCLC 310 - Violence and Gender Credits: 3-15
• NCLC 320 - Construction of Differences: Race, Class, and Gender Credits: 3-15
• NCLC 361 - Neighborhood, Community, and Identity Credits: 3-15
• NCLC 381 - When Cultural Worlds Collide Credits: 3-15
• PHIL 254 - Contemporary Ethical Problems Credits: 3
• PHIL 309 - Bioethics Credits: 3
• PHIL 355 - Theories of Ethics Credits: 3
• PSYC 231 - Social Psychology Credits: 3
• PSYC 333 - Industrial and Organizational Psychology Credits: 3
• SOCI 300 - Social Control and Human 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 - Racial and Ethnic Relations Credits: 3
• SOCI 315 - Sex and Gender in Contemporary Society Credits: 3
• SOCI 326 - Armed Conflict and Conflict Resolution Credits: 3
• SOCI 332 - Sociology of Urban Communities Credits: 3
• SOCI 340 - Power, Politics, and Society Credits: 3
• SOCI 352 - Social Problems Credits: 3
• SOCI 373 - The Community Credits: 3
• SOCI 492 - Sociology of Organizations Credits: 3
• SOCW 351 - Social Policy and Social Justice I Credits: 3
• SOCW 425 - Planning and Organizing for Community Change Credits: 3
• UNIV 342 - The George Mason Debates in Current Affairs Credits: 3

▲ Concentration in International Conflict (MACR)

Students choose four courses from:

• ADJ 405 - Law and Justice around the World Credits: 3
• ADJ 475 - Theory and Politics of Terrorism Credits: 3
• ANTH 312 - Political Anthropology Credits: 3
• ANTH 331 - Refugees Credits: 3
• ANTH 332 - Cultures in Comparative Perspective Credits: 3
• ANTH 333 - Humanitarian Action Credits: 3
• ANTH 365 - Race and Racism Credits: 3
• ANTH 385 - Gender, Class, and Ethnicity in Latin America Credits: 3
• ANTH 440 - Public Anthropology: Seeking Solutions in the Public and Private Sectors Credits: 3

• COMM 412 - Politics and the Mass Media Credits: 3
or
• GOVT 412 - Politics and the Mass Media Credits: 3

• CONF 240 - 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
• CONF 495 - Organizations and Actors in the Conflict Field Credits: 3
• ECON 360 - Economics of Developing Areas Credits: 3
• ECON 361 - Economic Development of Latin America Credits: 3
• GEOG 301 - Political Geography 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 342 - Diplomacy Credits: 3
• GOVT 345 - Political Islam Credits: 3
• GOVT 349 - Issues in the Analysis of Global Systems Credits: 1-3
• GOVT 421 - Contemporary Political Ideologies Credits: 3
• GOVT 432 - Political Change and Social Development in Sub-Saharan Africa Credits: 3
• GOVT 446 - International Law and Organization Credits: 3
• GOVT 448 - Ethics and International Politics Credits: 3
• HIST 364 - Revolution and Radical Politics in Latin America Credits: 3
• HIST 461 - Arab-Israeli Conflict Credits: 3
• HIST 466 - Origins of Conflict in Southern Africa Credits: 3
• MGMT 461 - Cross Cultural and Global Management Credits: 3
• MSOM 305 - Managing in a Global Economy Credits: 3
• NCLC 381 - When Cultural Worlds Collide Credits: 3-15
• PHIL 327 - Contemporary Western Political Theory Credits: 3
• PHIL 355 - Theories of Ethics 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 350 - Community, Diversity, and Democracy: A Practicum Credits: 3
• SOCI 450 - The Holocaust: The Construction of Social History through Survivor Testimonies Credits: 3

Additional Courses:

Students may choose to take additional courses from any of the concentration lists. Students should also consider CONF 341 Simulation in Global Conflict Resolution (1 credit).
Conflict Analysis and Resolution, BS

Banner Code: CA-BS-CONF

Students must fulfill all requirements for bachelor's degrees including university general education requirements. CAR majors must also complete 54 major requirement credits for the BS degree.

Students pursuing a double major/degree with a program outside of the ICAR 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

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 a 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 CAR. Students may use nonactivity PHED courses for elective credit for 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.

Required core courses (15 credits):

- CONF 101 - Conflict and Our World Credits: 3
- CONF 300 - Conflict Resolution Techniques and Practice Credits: 3
- CONF 301 - Research and Inquiry in Conflict Resolution Credits: 3
- CONF 302 - Identity Conflicts and their Resolution 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
Research methods (6 credits):

- STAT 250 - Introductory Statistics I Credits: 3

3 credits chosen from:

- ADJ 300 - Research Methods and Analysis Credits: 4
- ANTH 380 - Language and Culture Credits: 3
- ANTH 450 - Qualitative Methods: Nonstatistical Approaches in Culture and Social Research Credits: 3
- ENGL 327 - Introduction to Cultural Studies Credits: 3
- GOVT 300 - Research Methods and Analysis Credits: 4
- GOVT 366 - Public Policy Analysis Credits: 3
- GOVT 400 - Political Research and Data Analysis Credits: 3
- PHIL 357 - Philosophy of the Social Sciences Credits: 3
  or
- SOCI 599 - Issues in Sociology Credits: 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
  or
- IT 362 - Introduction to Computer Statistical Packages Credits: 3
- STAT 474 - Introduction to Survey Sampling Credits: 3

Field experience (3 credits):

Students can choose to fulfill this requirement through an internship, service learning, or study abroad. Students register for internship credits through New Century College. More information is available at http://ncc.gmu.edu. Students interested in study abroad should register through the Center for Global Education. More information can be found at http://www.gmu.edu/departments/cge. Prior approval by the major advisor is required for all field experience options.

Internship/Service Learning:

- NCLC 390 - Internship Credits: 1-6
- NCLC 490 - Internship Credits: 1-6
- CONF 375 - Special Programs Field Experience Credits: 1-6
- NCLC 395 - Field-Based Work Credits: 1-15
- NCLC 495 - Field-Based Work Credits: 1-15
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 CAR director will consider student requests for approval of courses not listed below.

▲ Concentration in Interpersonal Conflict (MICR)

Students choose four courses from:

- ADJ 302 - Delinquency Credits: 3
- ADJ 404 - Crime Victims and Victimization Credits: 3
- ADJ 406 - Family Law and the Justice System Credits: 3
- 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 305 - Foundations of Intercultural Communication Credits: 3
- CONF 202 - 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
- CONF 495 - Organizations and Actors in the Conflict Field Credits: 3
- NCLC 305 - Conflict Resolution and Transformation Credits: 6
- NCLC 310 - Violence and Gender Credits: 3-15
- 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: 3-15
- PHIL 309 - Bioethics Credits: 3
- PHIL 355 - Theories of Ethics Credits: 3
- PSYC 231 - Social Psychology Credits: 3
- PSYC 321 - Counseling Psychology Credits: 3
- PSYC 324 - Personality Theory Credits: 3
- PSYC 467 - The Psychology of Working in Groups and Teams Credits: 3
- SOCI 300 - Social Control and Human Freedom Credits: 3
- SOCI 302 - Sociology of Delinquency Credits: 3
- SOCI 305 - Sociology of Small Groups Credits: 3
- SOCI 309 - Marriage, Families, and Intimate Life Credits: 3
- SOCI 350 - Community, Diversity, and Democracy: A Practicum Credits: 3
- SOCW 323 - Human Behavior in the Social Environment I Credits: 3
Concentration in Community and Organizational Conflict (MEZZ)

Students choose four courses from:

- ADJ 302 - Delinquency Credits: 3
- ADJ 406 - Family Law and the Justice System Credits: 3
- ADJ 407 - Law and Society Credits: 3
- ANTH 310 - Social Organization and Kinship Credits: 3
- ANTH 365 - Race and Racism Credits: 3
- ANTH 488 - Gender, Sexuality, and Culture 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
- CONF 202 - Dialogue and Difference Credits: 3
- CONF 240 - 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
- CONF 495 - Organizations and Actors in the Conflict Field Credits: 3
- ECON 309 - Economic Problems and Public Policies Credits: 3
- ECON 320 - Labor Problems Credits: 3
- GEOG 306 - Urban Geography Credits: 3
- GEOG 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 365 - State and Regional Public Policy Credits: 3
- GOVT 414 - Politics of Race and Gender Credits: 3
- HIST 340 - History of American Racial Thought Credits: 3
- HIST 350 - U.S. Women's History Credits: 3
- HIST 418 - Ethnic Groups in America Credits: 3
- MGMT 301 - Managing People and Organizations Credits: 3
- or
- MSOM 301 - Managing People and Organizations Credits: 3
- MGMT 412 - Diversity in Organizations Credits: 3
- MGMT 463 - Negotiations in Organizations Credits: 3
- NCLC 301 - Science in the News Credits: 3
- NCLC 304 - Social Movements and Community Activism Credits: 4
- NCLC 310 - Violence and Gender Credits: 3-15
- NCLC 320 - Construction of Differences: Race, Class, and Gender Credits: 3-15
- NCLC 361 - Neighborhood, Community, and Identity Credits: 3-15
- NCLC 381 - When Cultural Worlds Collide Credits: 3-15
- PHIL 254 - Contemporary Ethical Problems Credits: 3
- PHIL 309 - Bioethics Credits: 3
- PHIL 355 - Theories of Ethics Credits: 3
PSYC 231 - Social Psychology Credits: 3
PSYC 333 - Industrial and Organizational Psychology Credits: 3
SOCI 300 - Social Control and Human 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 - Racial and Ethnic Relations Credits: 3
SOCI 315 - Sex and Gender in Contemporary Society Credits: 3
SOCI 326 - Armed Conflict and Conflict Resolution Credits: 3
SOCI 332 - Sociology of Urban Communities Credits: 3
SOCI 340 - Power, Politics, and Society Credits: 3
SOCI 352 - Social Problems Credits: 3
SOCI 373 - The Community Credits: 3
SOCI 492 - Sociology of Organizations Credits: 3
SOCW 351 - Social Policy and Social Justice I Credits: 3
SOCW 425 - Planning and Organizing for Community Change Credits: 3
UNIV 342 - The George Mason Debates in Current Affairs Credits: 3

▲ Concentration in International Conflict (MACR)

Students choose four courses from:

- ADJ 405 - Law and Justice around the World Credits: 3
- ADJ 475 - Theory and Politics of Terrorism Credits: 3
- ANTH 312 - Political Anthropology Credits: 3
- ANTH 331 - Refugees Credits: 3
- ANTH 332 - Cultures in Comparative Perspective Credits: 3
- ANTH 333 - Humanitarian Action Credits: 3
- ANTH 365 - Race and Racism Credits: 3
- ANTH 385 - Gender, Class, and Ethnicity in Latin America Credits: 3
- ANTH 440 - Public Anthropology: Seeking Solutions in the Public and Private Sectors Credits: 3
- COMM 412 - Politics and the Mass Media Credits: 3
  or
- GOVT 412 - Politics and the Mass Media Credits: 3

- CONF 240 - 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
- CONF 495 - Organizations and Actors in the Conflict Field Credits: 3
- ECON 360 - Economics of Developing Areas Credits: 3
- ECON 361 - Economic Development of Latin America Credits: 3
- GEOG 301 - Political Geography 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 342 - Diplomacy Credits: 3
• GOVT 345 - Political Islam Credits: 3
• GOVT 349 - Issues in the Analysis of Global Systems Credits: 1-3
• GOVT 421 - Contemporary Political Ideologies Credits: 3
• GOVT 432 - Political Change and Social Development in Sub-Saharan Africa Credits: 3
• GOVT 446 - International Law and Organization Credits: 3
• GOVT 448 - Ethics and International Politics Credits: 3
• HIST 364 - Revolution and Radical Politics in Latin America Credits: 3
• HIST 461 - Arab-Israeli Conflict Credits: 3
• HIST 466 - Origins of Conflict in Southern Africa Credits: 3
• MGMT 461 - Cross Cultural and Global Management Credits: 3
• MSOM 305 - Managing in a Global Economy Credits: 3
• NCLC 381 - When Cultural Worlds Collide Credits: 3-15
• PHIL 327 - Contemporary Western Political Theory Credits: 3
• PHIL 355 - Theories of Ethics 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 450 - The Holocaust: The Construction of Social History through Survivor Testimonies Credits: 3

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:

Students may choose to take additional courses from any of the concentration lists. Students should also consider CONF 341 Simulation in Global Conflict Resolution (1 credit).

Undergraduate Minor

Conflict Analysis and Resolution Minor

Banner Code: CONF

Students are required to achieve a minimum of 2.00 GPA in courses applied to a minor. At least 8 credits of the minor must be applied only to the CAR minor and may not be used to fulfill requirements of the student’s major, major concentration, or another minor.

Advising
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 a 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 CAR. Students may use nonactivity PHED courses for elective credit for CAR degrees.

**Course Work**

Students pursuing a minor complete 18 credits distributed as follows:

**Required core courses (6 credits):**

- CONF 101 - Conflict and Our World 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 (9 credits):**

Students choose courses from one 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 CAR director will consider student requests for approval of courses not listed below.

**Emphasis in Interpersonal Conflict**

Students choose three courses from:

- ADJ 302 - Delinquency Credits: 3
- ADJ 404 - Crime Victims and Victimization Credits: 3
- ADJ 406 - Family Law and the Justice System Credits: 3
- 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 305 - Foundations of Intercultural Communication Credits: 3
- CONF 202 - 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
- CONF 495 - Organizations and Actors in the Conflict Field Credits: 3
Emphasis in Community and Organizational Conflict

Students choose three courses from:

- ADJ 302 - Delinquency Credits: 3
- ADJ 406 - Family Law and the Justice System Credits: 3
- ADJ 407 - Law and Society Credits: 3
- ANTH 310 - Social Organization and Kinship Credits: 3
- ANTH 365 - Race and Racism Credits: 3
- ANTH 488 - Gender, Sexuality, and Culture 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
- CONF 202 - Dialogue and Difference Credits: 3
- CONF 240 - 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
- CONF 495 - Organizations and Actors in the Conflict Field Credits: 3
- ECON 309 - Economic Problems and Public Policies Credits: 3
- ECON 320 - Labor Problems Credits: 3
- GEOG 306 - Urban Geography Credits: 3
- GEOG 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 365 - State and Regional Public Policy Credits: 3
- GOVT 414 - Politics of Race and Gender Credits: 3
- HIST 340 - History of American Racial Thought Credits: 3
- HIST 350 - U.S. Women's History Credits: 3
- HIST 418 - Ethnic Groups in America Credits: 3

- MGMT 301 - Managing People and Organizations Credits: 3
or
- MSOM 301 - Managing People and Organizations Credits: 3

- MGMT 412 - Diversity in Organizations Credits: 3
- MGMT 463 - Negotiations in Organizations Credits: 3
- NCLC 301 - Science in the News Credits: 3
- NCLC 304 - Social Movements and Community Activism Credits: 4
- NCLC 310 - Violence and Gender Credits: 3-15
- NCLC 320 - Construction of Differences: Race, Class, and Gender Credits: 3-15
- NCLC 361 - Neighborhood, Community, and Identity Credits: 3-15
- NCLC 381 - When Cultural Worlds Collide Credits: 3-15
- PHIL 254 - Contemporary Ethical Problems Credits: 3
- PHIL 309 - Bioethics Credits: 3
- PHIL 355 - Theories of Ethics Credits: 3
- PSYC 231 - Social Psychology Credits: 3
- PSYC 333 - Industrial and Organizational Psychology Credits: 3
- SOCI 300 - Social Control and Human 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 - Racial and Ethnic Relations Credits: 3
- SOCI 315 - Sex and Gender in Contemporary Society Credits: 3
- SOCI 326 - Armed Conflict and Conflict Resolution Credits: 3
- SOCI 332 - Sociology of Urban Communities Credits: 3
- SOCI 340 - Power, Politics, and Society Credits: 3
- SOCI 352 - Social Problems Credits: 3
- SOCI 373 - The Community Credits: 3
- SOCI 492 - Sociology of Organizations Credits: 3
- SOCW 351 - Social Policy and Social Justice I Credits: 3
- SOCW 425 - Planning and Organizing for Community Change Credits: 3
- UNIV 342 - The George Mason Debates in Current Affairs Credits: 3

**Emphasis in International Conflict**

Students choose three courses from:

- ADJ 405 - Law and Justice around the World Credits: 3
- ADJ 475 - Theory and Politics of Terrorism Credits: 3
- ANTH 312 - Political Anthropology Credits: 3
- ANTH 331 - Refugees Credits: 3
- ANTH 332 - Cultures in Comparative Perspective Credits: 3
- ANTH 333 - Humanitarian Action Credits: 3
- ANTH 365 - Race and Racism Credits: 3
• ANTH 385 - Gender, Class, and Ethnicity in Latin America Credits: 3
• ANTH 440 - Public Anthropology: Seeking Solutions in the Public and Private Sectors Credits: 3

• COMM 412 - Politics and the Mass Media Credits: 3
  or
• GOVT 412 - Politics and the Mass Media Credits: 3

• CONF 240 - 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
• CONF 495 - Organizations and Actors in the Conflict Field Credits: 3
• ECON 360 - Economics of Developing Areas Credits: 3
• ECON 361 - Economic Development of Latin America Credits: 3
• GEOG 301 - Political Geography 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 342 - Diplomacy Credits: 3
• GOVT 345 - Political Islam Credits: 3
• GOVT 349 - Issues in the Analysis of Global Systems Credits: 1-3
• GOVT 421 - Contemporary Political Ideologies Credits: 3
• GOVT 432 - Political Change and Social Development in Sub-Saharan Africa Credits: 3
• GOVT 446 - International Law and Organization Credits: 3
• GOVT 448 - Ethics and International Politics Credits: 3
• HIST 364 - Revolution and Radical Politics in Latin America Credits: 3
• HIST 461 - Arab-Israeli Conflict Credits: 3
• HIST 466 - Origins of Conflict in Southern Africa Credits: 3
• MGMT 461 - Cross Cultural and Global Management Credits: 3
• MSOM 305 - Managing in a Global Economy Credits: 3
• NCLC 381 - When Cultural Worlds Collide Credits: 3-15
• PHIL 327 - Contemporary Western Political Theory Credits: 3
• PHIL 355 - Theories of Ethics 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 450 - The Holocaust: The Construction of Social History through Survivor Testimonies Credits: 3

Additional Courses:

Students may choose to take additional courses from any of the concentration lists. Students should also consider CONF 341 - Simulation in Global Conflict Resolution (1 credit).
Dual Degree

Social Work and Conflict Analysis and Resolution Dual Degree, MS (ICAR)

Banner Codes: HH-MSW-SOCW and CA-MS-CONF

The Department of Social Work and the Institute 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.

Admissions Requirements

Students interested in the 3-year Dual Degree program on MSW and Master’s in Conflict Analysis & Resolution must complete a University Graduate Application (one application; designate Social Work as the primary program). One Goal Statement, Three Letters of Recommendation, and Transcripts are required. In answering the Goal Statement and on Letters of Recommendation, please address your interest in both programs.

In addition, for the MSW, submit a Resume, Critical Thinking Essay, and Application Data Form. On the MSW checklist and applicant data form, check Dual Degree.

Application materials are to be submitted to the College of Health and Human Services.

If accepted to the Dual Degree program, one letter will be sent from the Social Work Department Chair and Director of the Institute on Conflict Analysis and Resolution. An orientation on the Dual Degree will be held during the summer prior to the beginning of the program. Advising will be done collaboratively between the two programs.

Please note that in order to complete the Dual Degree, students must be accepted to both programs at the same time (fall semester admission), complete the courses as outlined in the curriculum beginning in the fall, and graduate with both degrees at the same time. Students who are already enrolled in either program are not eligible to complete the Dual Degree.

Degree Requirements

Students must successfully complete the following:

Social Work Courses (50 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: 4
- SOCW 685 - Organizational Leadership for Social Workers Credits: 4
- SOCW 687 - Empowering Communities for Change Credits: 4
- SOCW 688 - Advanced Research in Social Work Credits: 3
- SOCW 694 - Social Change Practicum I Credits: 4
- SOCW 695 - Social Change Practicum II Credits: 4

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 642 - Integration of Theory and Practice Credits: 3
- CONF 694 - Internship Credits: 1-6
  3 credits of CONF 694 are required
- CONF 713 - Reflective Practice in Interpersonal-Multiparty Conflicts Credits: 3
- CONF 795 - Professional Development Seminars Credits: 1-3
  5 credits of CONF 795 are required

Electives

- 12 credits of CONF electives, selected with approval from ICAR

Total: 85 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.

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 ICAR graduate courses taken at George Mason as a non-degree graduate student, or as part of ICAR'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-ICAR courses taken as non-degree credit can be counted toward the M.S. program. Courses counted toward another degree cannot be transferred.

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 ICAR student handbook for information on registration procedures.

Required Courses

Students take the following 15 credits of required course work.

- **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 713** - 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 students M.S. coursework.

Elective Courses

Students take 20 credits of elective coursework. Electives are any 500, 600, or 700 level CONF courses, except required courses and courses from the Graduate Certificate Program. With the advisor's approval, each student is eligible to include a maximum of 6 credits of electives from outside the ICAR program, including courses in other Mason departments, consortium courses, ICAR graduate certificate courses, and transfer courses from other universities.

Integrative Courses

Students must complete 6 credits of integrative work, choosing 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: 6

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: 1-3

Thesis

Students wishing to complete a Master's Thesis are strongly encouraged to take CONF 798 (Thesis Proposal) the semester before beginning the thesis project. Before registering, students must have identified a Master's thesis committee chair to supervise the project.

- CONF 798 - Thesis Proposal 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.

- CONF 697 - Directed Reading Credits: 1-3

Master's Level Certificate

Conflict Analysis and Resolution 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 Conflict Analysis and Resolution 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.

**Certificate Requirements**

Fifteen credits are required for each graduate certificate degree.

**Required Courses**

Students take 12 credits of required course work.

- 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**

Students take 3 credits of elective course work. They 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.
Conflict Analysis and Resolution for 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 Conflict Analysis and Resolution for 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.

Certificate Requirements

Fifteen credits are required for each graduate certificate degree.

Required Courses

Students take 12 credits of required coursework.

- 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

Students take 3 credits of elective course work. They 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.

Conflict Analysis and Resolution for 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 Conflict Analysis and Resolution for 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.

Certificate Requirements

Fifteen credits are required for each graduate certificate degree.

Required Courses
Students take 12 credits of required course work.

- 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

Students take 3 credits of elective course work. They 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.

Environmental Conflict Resolution and Collaboration Graduate Certificate

Banner Code: CA-CERG-ECR

The Institute for Conflict Analysis and Resolution (ICAR) 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.

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 ICAR 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.
Certificate Requirements

Fifteen credits are required for the graduate certificate.

Core Courses

Students take 9 credits of core courses. 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 credits required in environmental conflict resolution skills and competencies. 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 Courses

Students take 3 credits of elective course work, they 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: 1-4
- 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
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. 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.

Certificate Requirements

Fifteen credits are required for each graduate certificate.

Required Courses

Students take 12 credits of required course work.

- 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

Students take 3 credits of elective course work. They 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.

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 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 Requirements

A master’s degree or equivalent degree is required for admission to the PhD 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. 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 enroll on a full- or part-time basis, entry into the program is in the fall semester only.

Credit for Prior Study

Students who have earned an MS in conflict analysis and resolution from Mason may have the course total required for a doctoral degree reduced by 15 credits. The actual number of credits reduced is determined in consultation with the student’s advisor and the program coordinator after a review of courses taken.
Students entering with other relevant degrees (MA, MS, or JD) may have the required course load reduced by up to 15 credits. 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 ICAR graduate courses taken at George Mason as a non-degree graduate student, or as part of ICAR's graduate certificate program may be transferred into the Ph.D. program. How credit will be counted will be determined in consultation with the accepted student's advisor. A maximum of 6 credits of non-ICAR courses taken as non-degree credit can be counted toward the Ph.D. program. Courses counted toward another degree cannot be transferred.

**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.

Competence in a foreign language must be shown by taking a placement test at Mason’s Language Laboratory. The test has oral and written components. Results of the proficiency test must indicate the student is proficient in the language at the intermediate level (competency at completion of 202, 209, or 210 level). Please visit [http://mcl.gmu.edu/resources/placement_testing.html](http://mcl.gmu.edu/resources/placement_testing.html) for testing times and details.

If the student desires testing in a language that Mason does not offer, the test can be taken at an outside organization, embassy, church, or other entity. The student must submit a letter to Mason certifying that the test was passed at a high, intermediate, or low advanced level. The student may submit for approval the names and qualifications of those capable of administering such a test. Please use the waiver form found on the Department of Modern and Classical Languages website: [http://mcl.gmu.edu/resources/placement_testing.html](http://mcl.gmu.edu/resources/placement_testing.html)

After students pass their comprehensive exam and before they register for CONF 998, they should notify the PhD coordinator about the language they have selected to satisfy the foreign language requirement.

**Advancement to PhD Candidacy**

After completing course work (except the dissertation) listed on the Program of Studies, passing written comprehensive exams, and completing the language requirement, students are advanced to candidacy. A candidate is permitted five years from the advancement date to complete the dissertation.

**Degree Requirements**

Fifty-seven credits are required. Students must complete coursework, comprehensive exams, and be advanced to candidacy within six years of their official admission date.

**Required Courses**

Students take 27 credits of required course work.

- CONF 711 - The Conventions of Statistical Methodology Credits: 3
- CONF 713 - Reflective Practice in Interpersonal-Multiparty Conflicts Credits: 3
• CONF 801 - Introduction to Conflict Analysis and Resolution Credits: 3
• CONF 802 - Theories of the Person Credits: 3
• CONF 803 - Structural Theories Credits: 3
• CONF 810 - Philosophy and Conflict Research Credits: 3
• CONF 811 - Advanced Quantitative Research Methods Credits: 3
• CONF 812 - Advanced Qualitative Research Methods Credits: 3
• CONF 900 - Integrating Theory, Practice, and Method in Conflict Analysis Credits: 3

Elective Courses

Eighteen elective credits must be completed prior to comprehensive exams. Electives are any 500-, 600-, and 700-level CONF courses, except required courses and courses from the Graduate Certificate Program. With the advisor’s approval, each student may include a maximum of 6 credits of electives from outside the ICAR Program, including courses in other Mason departments, consortium courses, ICAR graduate certificate 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.

Directed Readings

Only two directed readings (CONF 897) can be applied toward doctoral elective requirements.

• CONF 897 - Directed Reading Credits: 3

Dissertation Units

Students are required to complete 12 combined units of CONF 998 (Doctoral Dissertation Proposal) and CONF 999 (Doctoral Dissertation Research). 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, an appropriate grade 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, an appropriate grade is issued.)
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

Gary Galluzzo, Dean
Martin Ford, Senior Associate Dean
Peter Barcher, Associate Dean for Research
Joan Isenberg, Associate Dean for Outreach and Program Development
Ellen Rodgers, Associate Dean for Teaching and Academic Affairs
David Wiggins, Director of the School of Recreation, Health, and Tourism

Undergraduate Degrees, Minors, and Certificates

CEHD offers four undergraduate degrees, 13 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 Physics and Astronomy) and the College of Visual and Performing Arts (Departments of Dance and Music) to provide six collaborative undergraduate degree concentrations or emphases in Biology Education, Chemistry Education, Earth Science Education, Mathematics Education Music Education, and Physics 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.

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. 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 program and other administrative units.

**Graduate Degrees and Certificates**

CEHD offers one doctoral degree, seven master's degrees, and 31 graduate certificates. The requirements for each degree and certificate are described on their respective catalog pages. 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. 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 Office of Academic and Student Affairs (Robinson Hall, Suite 307; 703-993-2080; cehdoasa@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 School Director for courses taken within the School of Recreation, Health, and Tourism (RHT), and to the Program Coordinator for courses taken within the Graduate School of Education (GSE). The decision may be further appealed to the Associate Dean for Teaching 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.


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 (Robinson Hall, Room 103; 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, EDAL, EDCD, EDCI, EDEP, EDLE, EDRD, EDRS, EDSE, EDUC, EDUT, EFHP, HEAL, IETT, PHED, PRLS, SPMT, 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 one master's degree, four undergraduate degrees, six minors, and one undergraduate certificate. The MS in Exercise Science, Fitness, and Health Promotion prepares professionals to more adequately serve their communities or pursue advanced 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:** R. Baker, Banville, Bever, Daniels, Dieke, Kozlowski, Miller, Rikard, P. Rodgers, Schack, B. Wiggins  
**Assistant professors:** Allen, Ambegaonkar, Caswell, Esherick, Harmon, Lee, Park, Shelby, Winchester  
**Instructors:** Norden, Parham

**Course Work**
RHT offers course work designated ATEP, EFHP, HEAL, PHED, PRLS, SPMT, and TOUR in the Courses chapter of this catalog. Additional courses are offered for elective credit to George Mason University students. These courses are included under PHED and PRLS.

**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 two 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.

**Complementary Certificate Programs**

Students may also complete a complementary graduate certificate outside of RHT in the following areas:

**Environmental Management Undergraduate Certificate (SC-CERB-EVMG)**

For details on this 27-credit undergraduate certificate, 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.

**Gerontology Undergraduate Certificate (HH-CERB-GERO)**

For details on this 24-credit undergraduate certificate, see the College of Health and Human Services chapter of this catalog.

*Note:* Students interested in the Certificate in Gerontology should take BIOL 124 and BIOL 125.
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 - Credits: 3 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 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 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 168 - Introduction to Basketball 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 117 - Rock Climbing Credits: 2
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 challenge the Board of Certification (BOC®) Examination and practice as an entry-level certified 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, PHED 300).

Upon successful completion of all pre-professional course work with a grade of C or higher and a minimum cumulative GPA or 2.5, students may advance into the professional phase (three levels) of the program. Levels I-III require concurrent enrollment in didactic, clinical techniques, and clinical education practicum courses. The professional phase requires satisfactory completion of prerequisites, attainment of a grade of C or higher in all ATEP required course work, upholding a minimum cumulative within-major GPA of 2.5, and maintenance of current Emergency Cardiac Care (ECC) and First Aid certifications.

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, PHED 300) and attain a cumulative minimum within-major GPA of 2.5 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 ATEP. Students transferring from another institution must produce documentation that demonstrates successful completion of all pre-professional phase course work and related clinical experiences. Students must provide documentation of completion of all ATEP related prerequisite course work with a grade of C or higher and a cumulative within-major GPA of 2.5 or higher on a 4.0 scale. 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 will be assessed a laboratory fee $110. Professional phase students will be assessed a laboratory fee of $100 for each clinical techniques course. 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 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 and may be required to submit to a criminal background check. All students must have Emergency Cardiac Care (CPR, AED) and First Aid certifications before entering their first practicum experience and 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/

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 sciences (3)
  Must take HEAL 230
- Global understanding (3)
- Natural science (8)
  Must take BIOL 124 and BIOL 125
Pre-Professional Courses (24 credits)

- ATEP 150 - Introduction to Athletic Training and Preventative Care Techniques Credits: 3 Fall Semester
- ATEP 180 - Emergency Medical Care for Physically Active Populations Credits: 4 Spring Semester
- BIOL 124 - Human Anatomy and Physiology Credits: 4 Fall Semester
- BIOL 125 - Human Anatomy and Physiology Credits: 4 Spring Semester
- HEAL 110 - Personal Health Credits: 3 Fall Semester
- HEAL 230 - Introduction to Health Behavior Credits: 3 Spring Semester
- PHED 300 - Kinesiology Credits: 3 Spring Semester

Note:

Pre-professional requirements BIOL 124, BIOL 125, and HEAL 230 are satisfied as General Education credits. They are therefore, not included in the total pre-professional credit count.

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) (22 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
- PHED 450 - Physiology of Exercise Credits: 4 Fall Semester

Professional Courses (Level III) (21 credits)

- ATEP 441 - Practicum in Athletic Training Credits: 3 Spring Semester *
- ATEP 450 - Administration and Management in Athletic Training Credits: 3 * Fall Semester
- ATEP 456 - Practicum V: Professional Integration Credits: 6 * Fall Semester
Electives (5 credits)

Choose an additional 5 credits

Notes

*Indicates concurrent enrollment required. Practicum courses require a clinical education field experience component.

Total: 123 credits

Health, Fitness, and Recreation Resources, BS

Banner Code: E1-BS-HFRR

This 120-credit degree allows students to specialize in one of five varied concentrations (Exercise Science, Health Promotion, Parks and Outdoor Recreation, Sport Management, and Therapeutic Recreation).

Internship Application

The HFRR internship is a 12-credit course taken toward 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, PRLS 490, and SPMT 490). The internship is designed to be a synthesis experience for each student in their specific concentration area. The internship process begins with an 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 (480 hours for therapeutic recreation) of an applied experience in their field of study. Throughout the internship, 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.

▲ Concentration in Exercise Science (EXS)

This concentration emphasizes promotion of healthy lifestyles outside school settings. Students are prepared for supervisory and managerial careers in private and public fitness agencies and clinical and public safety settings. Students complete supervised internships 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)
  Must take BIOL 124 and BIOL 125

Professional Sequence (71 credits)

- HEAL 205 - Principles of Accident Causation and Prevention Credits: 4
- HEAL 220 - Dimensions of Mental Health 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 430 - Seminar in Exercise Science and Health Promotion Credits: 3
- HEAL 490 - Internship Credits: 12
- PHED 200 - Professional Dimensions of Health, Recreation, and Physical Education Credits: 3
- PHED 300 - Kinesiology Credits: 3
- PHED 364 - Strength Training: Concepts and Applications Credits: 3
- PHED 365 - Measurement and Evaluation of Physical Fitness Credits: 3
  Satisfies the university Writing Intensive requirement
- PHED 410 - Social/Psychological Aspects of Health and Fitness Credits: 3 **
- PHED 450 - Physiology of Exercise Credits: 4
- PRLS 310 - Program Planning and Design 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
- SPMT 304 - Sport, Culture, and Society Credits: 3

Notes:

*PRLS 327 may be substituted for HEAL 350.

**HEAL 230 or PRLS 317 may be substituted for PHED 410.

Electives (11)
Choose an additional 11 credits

Total: 120 credits

▲ 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 six credits from the following:

• 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

Notes:

*PRLS 317 or PHED 410 may be substituted for HEAL 230.

**PRLS 327 may be substituted for HEAL 350.

Electives (12)

Choose an additional 12 credits

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 National Recreation and Park Association. Graduates are employed in national, state, and local recreation and park agencies, non-profit organizations, and private and commercial operations. Students complete supervised internships 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)
  Students pursuing the Certificate in Environmental Management must take BIOL 213 and either BIOL 303 or BIOL 304

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 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
- PRLS 501 - Introduction to Natural Resources Law Credits: 3
- TOUR 362 - Cultural and Environmental Interpretation Credits: 3

Electives (12)

Choose an additional 12 credits

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: 12
Electives (17)

Choose an additional 17 credits

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 foundation, law, issues, and assessment courses, 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 degree program is accredited by the National Recreation and Park Association. 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 (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 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 - Issues and Trends 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
- PRLS 503 - Disability Rights Law in Therapeutic Recreation Credits: 3
- PSYC 211 - Developmental Psychology Credits: 3
- PSYC 325 - Abnormal Psychology Credits: 3

Electives (12)

Choose an additional 12 credits

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.

Student Teaching Internship

To enroll in student teaching, physical education majors must have a minimum 2.50 GPA in the last 60 credits of course work and submit copies of official passing scores for the VCLA and PRAXIS II exams. 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.

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 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).

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)
  Must take BIOL 124 and BIOL 125

Professional Sequence (82 credits)

- 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
- PHED 108 - Weight Training and Body Conditioning Credits: 1
- 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 300 - Kinesiology Credits: 3
• PHED 306 - Psychomotor Learning Credits: 3
• PHED 308 - Adapted Physical Education Credits: 3
• PHED 365 - Measurement and Evaluation of Physical Fitness 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: 12
• PHED 450 - Physiology of Exercise Credits: 4
• 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.

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.

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 (64 credits)

- HEAL 323 - Program Leadership and Evaluation 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
- TOUR 200 - Introduction to Travel and Tourism Credits: 3
- TOUR 220 - Introduction to Event Management Credits: 3
- TOUR 241 - Practicum 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 362 - Cultural and Environmental Interpretation Credits: 3
- TOUR 412 - Tourism and Events Marketing Credits: 3
- TOUR 414 - Tourism and Events Finance Credits: 3
- TOUR 420 - Tourism Planning/Policy Credits: 3
- TOUR 440 - Meetings and Conventions Credits: 3
- TOUR 470 - Senior Seminar Credits: 1
- TOUR 490 - Internship Credits: 12

Choose six credits from the following:

- HEAL 350 - Interventions for Populations and Communities at Risk Credits: 3
- PRLS 317 - Social Psychology of Play and Recreation Credits: 3
- PRLS 402 - Human Behavior in Natural Environments Credits: 3
- PRLS 405 - Planning, Design, and Maintenance of Leisure Facilities Credits: 3
- PRLS 411 - Administration of RHT Organizations II Credits: 3
- TOUR 190 - Wedding Planning Credits: 3
- TOUR 210 - Global Understanding through Travel and Tourism Credits: 3
- TOUR 221 - Event Implementation and Evaluation Credits: 3
- TOUR 230 - Introduction to Hospitality Management Credits: 3
- TOUR 311 - Women and Tourism Credits: 3
- TOUR 430 - Tourism on Public Lands Credits: 3
- TOUR 480 - Special Topics Credits: 1-3
- TOUR 499 - Independent Study Credits: 1-3
Note:

TOUR 210 and TOUR 311 may not be used to satisfy both degree and general education requirements.

Electives (13 credits)

Choose an additional 13 credits

Total: 120 credits

Bachelor's Level Certificate

Outdoor Adventure Undergraduate Certificate

Banner Code: E1-CERB-OADV

This 25-credit certificate program provides students with specialized skills unique to a variety of outdoor adventure 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 adventure curriculum. Students completing this program are prepared to be certified Leave-No-Trace Trainers, as well as challenge-course facilitators for outdoor education and adventure education organizations.

Course Work

Required Core Courses (16 credits)

- PRLS 110 - Exploring Outdoor Adventure Credits: 2
- PRLS 210 - Introduction to Recreation and Leisure Credits: 3
- PRLS 214 - Field Study in Natural History Credits: 3
- PRLS 220 - Experiential Education Theory and Application Credits: 3
- PRLS 221 - Challenge Course Facilitator Field Work Credits: 2
- PRLS 316 - Outdoor Education and Leadership Credits: 3

Electives (9 credits)

Choose 9 credits from the following:

- PRLS 115 - Introduction to Fly Fishing Credits: 1
- PRLS 117 - Rock Climbing Credits: 2
- PRLS 120 - Introduction to Backpacking Credits: 2
- PRLS 170 - Introduction to White-water Kayaking Credits: 1
- PRLS 173 - Basic Coastal Kayaking Credits: 2
- PRLS 180 - White-water Canoeing Credits: 2
- PRLS 181 - White-water Canoeing II Credits: 2
- PRLS 190 - Downhill and Cross-Country Skiing Credits: 1
- PRLS 250 - Wilderness Travel and Sustainability Credits: 2
- PRLS 480 - Special Topics in Parks, Recreation, and Leisure Studies Credits: 3

Total: 25 credits

Undergraduate Minor

Exercise Science Minor

Banner Code: EXS

This 16-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 Exercise Science or 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 330 - Nutrition Credits: 3
- PHED 300 - Kinesiology Credits: 3
- PHED 364 - Strength Training: Concepts and Applications Credits: 3
- PHED 365 - Measurement and Evaluation of Physical Fitness Credits: 3
- PHED 450 - Physiology of Exercise Credits: 4

Total: 16 credits

Health Promotion Minor

Banner Code: HPR

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

Parks, Recreation, and Leisure Studies Minor

Banner Code: PRLS

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 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

- SPMT 304 - Sport, Culture, and Society Credits: 3
- HIST 389 - Topics in U.S. History Credits: 3
  History of Sport in America

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 389 - Topics in U.S. History Credits: 3
  African-American Experience in Modern American Sport
  Gender and Twentieth-Century Capital American Sport
  The Growth of American Entertainment and Sport

Total: 18 credits

Sport Management Minor

Banner Code: SPMT

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

- PRLS 410 - Administration of RHT Organizations I Credits: 3
- SPMT 201 - Introduction to Sport Management 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 455 - Governance and Policy in Sport Organizations Credits: 3
Total: 18 credits

Tourism and Events Management Minor

Banner Code: TEM

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 30-credit master's degree focuses on the role of physical activity in the promotion of health, fitness, and quality of life. Completion of this degree may lead to the pursuit of further academic study (doctoral programs) or preparation of professionals equipped to more adequately serve their communities. Students may select to pursue a thesis or non-thesis option for completion of this degree.

Course Work (18 credits)

- EFHP 606 - Foundations of Exercise, Fitness, and Health Promotion 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
- EFHP 623 - Research Design and Statistical Reasoning Credits: 3

Options

Thesis Option (12 credits)

- **Electives**: Choose an additional 6 credits with advisor/coordinator approval
- EFHP 799 - Thesis Credits: 1-6 (Must register for 6 credits)

Note:

Students must select an advisor from among the EFHP graduate faculty to supervise thesis work and chair the three-member thesis committee. Committee members are appointed by the EFHP Graduate Coordinator(s). 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(s).

Total: 30 credits

Nonthesis Option (12 credits)

- **Electives**: Choose an additional 12 credits with advisor/coordinator approval
- Written Comprehensive Examination

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.
The Graduate School of Education (GSE) offers one doctoral degree, six master's degrees, seven minors, and 31 graduate certificates. Within each of these degree programs students have the option to choose a concentration or emphasis that best meets their interests or needs. Additionally, students may pursue course work leading to initial teacher licensure.

Faculty


Associate professors: Bannan-Ritland, Bauer, Bon, Brazer, Brigham, Burns, Castle, Clark, Dabbagh, DeMulder, Duck, Falconer, Fox, Grant, Kaffenberger, Kidd, Kitsantas, Ndura, Osterling, Pierce, Razeghi, Reybold, Samaras, Sanchez, Sprague, Talleyrand, Thomas, Thorp, Upperman, Werner, Wong, Zenkov

Assistant professors: P. Baker, Buehl, Cozart, Day, Frazier, Hanley, Hardy, Hjalmarson, Hruby, Jerome, Kalbfleisch, Malloy, Nasser, Parsons, Peters, Regan, Sheridan, Shockley, Suh, Swanson, Taboada, View, N. Williams, Williams van Rooij

Instructors: Hathaway, Rioux-Bailey

Course Work

GSE offers course work designated EDCD, EDCI, EDEP, EDIT, EDLE, EDRD, EDRS, EDSE, EDUC, and EDUT 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. Six 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 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.

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 Department of Molecular and Microbiology (MMB) 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 Department of Physics and Astronomy section in the College of Science chapter of this catalog.

**Peace Corps Fellows and Master's International Programs (MIP)**

The FAST TRAIN (The Foreign Affairs' Spouses Teacher Training) Program is an approved site for the Peace Corps 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 Peace Corps 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**

**Assistive Technology Minor**

*Banner Code: AT*

This 15-credit minor provides undergraduate students with background knowledge in assistive technology. 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

- 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 Special Education Minor

Banner Code: ECSE

This 15-credit minor provides undergraduate students with background knowledge in Early Childhood Special Education. Completing this minor partially fulfills requirements for licensure in Early Childhood Special Education in Virginia. Eight credits of course work must be unique to the minor.

Course Work

- EDSE 405 - Introduction to Early Childhood Special Education Credits: 3
- EDSE 415 - Early Intervention for Infants and Toddlers with Disabilities: Collaborative and Consultative Approaches Credits: 3
- EDSE 457 - Foundations of Language and Literacy for Diverse Learners Credits: 3
- EDSE 458 - Medical Aspects of Physical and Sensory Disabilities in Young Children Credits: 3
- EDSE 459 - Curriculum and Methods: Early Childhood Special Education Credits: 3

Additional suggested course work:
- EDSE 456 - Language Development and Communication for Diverse Infants and Toddlers Credits: 3

Total: 15 credits
Education Studies Minor

Banner Code: ESTU

This 18-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: 3-15 (Must register for 3 credits)

Total: 18 credits

Mild Disabilities Minor

Banner Code: MDIS

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

This 24-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.

Course Work

- EDCI 370 - Young Adult Literature in Multicultural Settings Credits: 3
- EDCI 569 - Teaching English in the 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

Severe Disabilities Minor

Banner Code: SPSD

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

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. Students may choose up to two of the following concentrations.

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 (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: Alternative Education (AALT)**

The 18-credit alternative education concentration provides advanced professional development for practicing teachers who work in programs for students who are at risk of dropping out of school, have significant life challenges, or have been suspended. Completion of the concentration provides a certificate in alternative education.

**Course Work**

- EDAE 600 - Alternative Education for At-Risk Youth Credits: 1
- EDAE 601 - Curriculum and Methods in Alternative Education Credits: 3
- EDAE 602 - Preparing Students for Employment and Living Independently Credits: 2
- EDAE 603 - Communication and Management Strategies for Alternative Education Credits: 3
- EDAE 604 - Multidisciplinary and Interagency Collaboration Credits: 3
- EDSE 551 - Classroom Management: Theory and Practice Credits: 3

**Electives**

Choose one 3-credit course with advisor's approval

**Total: 18 credits**

▲ **Concentration in ASTL: Art Education (AART)**

The 18-credit art education concentration is designed for art teachers with current licensure in art PK–12. It consists of six required courses that address contemporary professional development content areas in art education.

**Course Work**

- AVT 605 - Issues and Research in Art Education Credits: 3
- AVT 615 - Technology for Art Teachers 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: 2
- EDEP 601 - Creativity and Cognition in the Arts and Media Credits: 3

**Electives**

Choose one studio course from the following:

- AVT 667 - Two-Dimensional Art Making: Form, Theme, and Context Credits: 4
- AVT 668 - Three-Dimensional Art Making across Cultures Credits: 4
- AVT 669 - Four Dimensional Art Making: Technology and New Media Credits: 4

**Note:**

AVT 615 is a 3-credit studio course. Qualified students who test out of this course should choose two of the above 4 credit studio courses for a total of 8 studio credits.

**Total: 18 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

Must complete five separate 3-credit MATH 600 special topics courses as noted below:

- MATH 600 - Special Topics in Mathematics Credits: 1-6
  Number Systems and Number Theory for K-8 Teachers Credits: 3
  Geometry and Measurement for K-8 Teachers Credits: 3
  Probability and Statistics for K-8 Teachers Credits: 3
  Algebra and Functions for K-8 Teachers Credits: 3
  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

Choose six credits in literature:

- FREN 515 - Medieval French Literature Credits: 3
- FREN 517 - Studies in Seventeenth-Century Literature Credits: 3
- FREN 518 - Studies in Eighteenth-Century Literature Credits: 3
- FREN 519 - Studies in Nineteenth-Century Literature Credits: 3
- FREN 525 - Studies in Modern French Literature Credits: 3
- FREN 550 - Special Topics Credits: 3

Note:

Courses may be substituted with advisor-approved literature-related electives in French.

Choose six credits in language and linguistics:

- FREN 560 - History of the French Language Credits: 3
- FREN 575 - Grammatical Analysis Credits: 3
- FREN 576 - Advanced Translation Credits: 3

Note:

Courses may be substituted with advisor-approved language and linguistics-related electives.
Electives

Choose six credits in literature or language (select from courses listed above or below)

- FREN 580 - Contemporary French Society and Culture Credits: 3
- 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 nine 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

• GEOG 520 - Geography for Teachers Credits: 3
• GEOG 533 - Issues in Regional Geography Credits: 1-6 (Must register for 3 credits)
• GEOG 550 - Geospatial Science Fundamentals Credits: 3
• GEOG 603 - Geographic Perspectives of Complex Natural Resource Management Topics Credits: 3
• GEOG 690 - Advanced Practicum in Geographical Applications Credits: 1-6 (Must register for 3 credits)
Electives

Choose two courses from the following:

- GEOG 581 - World Food and Population Credits: 3
- GEOG 505 - Transportation Geography Credits: 3
- GEOG 590 - Selected Topics in Geography and Cartography Credits: 3
- GEOG 553 - Geographic Information Systems Credits: 3
- GEOG 563 - Advanced Geographic Information Systems Credits: 3

Total: 21 credits

▲ Concentration in ASTL: 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

▲ 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
- GEOG 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: 3

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. 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 teachers seeking to improve their professional knowledge and teaching performance for improving student learning.

Course Work

- 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 553 - Teaching Creative Movement Credits: 3
- DANC 580 - Laban Movement Analysis 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 606 - Foundations of Exercise, Fitness, and Health Promotion 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

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 six 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; emotional disturbance and learning disabilities; emotional disturbance, learning disabilities, and mental retardation; mental retardation; or severe disabilities.

Course Work

Applied Behavior Analysis
- 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**

Choose 18 credits from the following:

- EDSE 522 - Assistive Technology for Individuals with Sensory Impairments Credits: 2-3
  or
- EDIT 522 - Assistive Technology for Individuals with Sensory Impairments Credits: 2-3
- EDSE 523 - Accessibility/Input Modification Credits: 1-3
  or
- EDIT 523 - Accessibility/Input Modification Credits: 1-3
- EDSE 524 - Assistive Technology for Individuals with Learning Disabilities Credits: 2
  or
- EDIT 524 - Assistive Technology for Individuals with Learning Disabilities Credits: 2
- EDSE 525 - Software for Individuals with Special Needs Credits: 1-2
  or
- EDIT 525 - Software for Individuals with Special Needs Credits: 1-2
- EDSE 526 - Web Accessibility and Design Credits: 3
  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

**Emotional Disturbance and Learning Disabilities (ED/LD) K–12**
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 626 - The Inclusive Classroom Credits: 3
  or
- EDSE 628 - Elementary Reading, Curriculum, and Strategies for Students who Access the General Education Curriculum Credits: 3
- EDSE 627 - Assessment 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: 18 credits

Emotional Disturbance, Learning Disabilities, and Mental Retardation (ED/LD/MR) K–12

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 542 - Characteristics of Students with Mental Retardation Credits: 3
  or
- EDSE 547 - Medical and Developmental Risk Factors for Children with Disabilities Credits: 3
- EDSE 627 - Assessment Credits: 3
- EDSE 628 - Elementary Reading, Curriculum, and Strategies for Students who Access the General Education Curriculum Credits: 3
  or
- EDSE 626 - The Inclusive Classroom Credits: 3
- EDSE 629 - Secondary Curriculum and Strategies for Students with Disabilities who Access the General Curriculum Credits: 3
- EDSE 661 - Curriculum and Methods: Severe Disabilities 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: 18 credits
Mental Retardation (MR) K–12

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 542 - Characteristics of Students with Mental Retardation Credits: 3
- EDSE 547 - Medical and Developmental Risk Factors for Children with Disabilities Credits: 3
- EDSE 627 - Assessment Credits: 3
- EDSE 628 - Elementary Reading, Curriculum, and Strategies for Students who Access the General Education Curriculum Credits: 3
  or
- EDSE 626 - The Inclusive Classroom Credits: 3
- EDSE 629 - Secondary Curriculum and Strategies for Students with Disabilities who Access the General Curriculum Credits: 3
- EDSE 661 - Curriculum and Methods: Severe Disabilities 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: 18 credits

Severe Disabilities (SD) K–12

Choose 18 credits from the following:

- EDSE 531 - Transition and Community-Based Instruction 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 532 - Positive Behavior Supports Credits: 3
  or
- EDSE 502 - Classroom Management and Applied Behavior Analysis Credits: 3
- EDSE 534 - Communication and Severe Disabilities Credits: 3
  or
- EDSE 533 - Curriculum and Assessment in Severe Disabilities Credits: 3
  or
- EDSE 627 - Assessment 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 register for 2 credits)
- EDSE 791 - Midpoint Portfolio Credits: 1
• EDSE 792 - Final Portfolio Credits: 1
• EDSE 622 - Augmentative Communication Credits: 2

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-UTEEM (Licensure) (EDUT)

This 63-credit concentration prepares students to apply for triple licensure. It provides professionals with the skills to work with culturally, linguistically, and ability-diverse young children and their families in schools and diverse community settings. Participation in the program requires a full-time, primarily daytime commitment for one summer and two academic years of integrated study and ongoing practice in four different internships. The program is designed to provide professionals with the specialized knowledge, skills, and dispositions needed to meet the developmental and educational needs of young children.

Course Work

• EDRS 590 - Education Research Credits: 3
• EDSE 517 - Computer Applications for Special Populations Credits: 3
• EDUT 511 - Developmental Pathways of Diverse Learners, Birth-Adolescence Credits: 3
• EDUT 512 - Assessment of Diverse Young Learners, Ages 3-5 Credits: 3
• EDUT 513 - Foundations of Language and Literacy for Diverse Learners Credits: 3
• EDUT 514 - Curriculum and Instruction for Diverse Learners, Ages 3-5 Credits: 3
• EDUT 521 - Infant/Toddler Development in Family and Cultural Contexts Credits: 3
• EDUT 522 - Family-Centered Assessment of Diverse Infants and Toddlers Credits: 3
• EDUT 523 - Developing Language, Literacy, and Communication in Diverse Young Children Credits: 3
EDUT 524 - Culturally, Linguistically, and Developmentally Appropriate Practices with Infants, Toddlers, and Their Families Credits: 3
EDUT 612 - Assessment of Diverse Young Learners Credits: 3
EDUT 613 - Language and Literacy Assessment and Instruction for Diverse Young Learners Credits: 3
EDUT 614 - Curriculum Across the Content Areas for Diverse Learners, K-3 Credits: 3
EDUT 615 - Mathematics and Science for Diverse Young Learners Credits: 3
EDUT 781 - Frameworks for Unified, Transformative Early Care and Education Credits: 3
EDUT 782 - Policy Perspectives Affecting Diverse Young Learners and Their Families Credits: 3
EDUT 790 - Internship with Diverse Learners Credits: 3
EDUT 791 - Internship with Diverse Infants and Toddlers and Their Families Credits: 3
EDUT 792 - Internship with Diverse Learners, K-3 Credits: 3
EDUT 793 - Specialization Internship with Diverse Learners and Their Families Credits: 6

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: 63 credits

▲Concentration in Early Childhood Education PK-3 (EPK3)

This 32-credit concentration prepares students to apply for initial teacher licensure. It provides professionals with the skills to work with culturally, linguistically, and ability-diverse young children and their families in schools and diverse community settings. The program is designed to provide professionals with the specialized knowledge, skills, and dispositions needed to meet the developmental and educational needs of young children in preschool to grade 3.

Course Work

- EDUT 511 - Developmental Pathways of Diverse Learners, Birth-Adolescence Credits: 3
- EDUT 513 - Foundations of Language and Literacy for Diverse Learners Credits: 3
- EDUT 514 - Curriculum and Instruction for Diverse Learners, Ages 3-5 Credits: 3
- EDUT 612 - Assessment of Diverse Young Learners Credits: 3
- EDUT 613 - Language and Literacy Assessment and Instruction for Diverse Young Learners Credits: 3
- EDUT 614 - Curriculum Across the Content Areas for Diverse Learners, K-3 Credits: 3
- EDUT 615 - Mathematics and Science for Diverse Young Learners Credits: 3
- EDUT 781 - Frameworks for Unified, Transformative Early Care and Education Credits: 3
- EDUT 782 - Policy Perspectives Affecting Diverse Young Learners and Their Families Credits: 3
- EDUT 790 - Internship with Diverse Learners Credits: 3
- EDSE 791 - Midpoint Portfolio Credits: 1
- EDSE 792 - Final Portfolio Credits: 1

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: 32 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. Two programs (one-or two-semester internships) provide flexibility for all students. The two-semester internship program begins each fall semester; the one-semester internship program begins each summer 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 (Year-long internship: students must register for 3 credits in the fall and 3 credits in the spring. Semester internship: students must register for 6 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 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 require-ments 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.

**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 with an initial licensure component prepares professionals with the knowledge, skills, and professional dispositions needed to teach Arabic to students in grades PK-12. The 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

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
• EDUC 598 - Directed Reading, Research, and Individual Projects Credits: 1-6 (Must register for 3 credits)

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: Chinese (ECHN)

This 39-credit Foreign Language: Chinese concentration with an initial licensure component prepares professionals with the knowledge, skills, and professional dispositions needed to teach Chinese to students in grades PK-12. The 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

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
- EDUC 598 - Directed Reading, Research, and Individual Projects Credits: 1-6 (Must register for 3 credits)

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: French (EFRN)

This 39-credit Foreign Language:French concentration with an initial licensure component prepares professionals with the knowledge, skills, and professional dispositions needed to teach French to students in grades PK-12. The 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
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
- EDUC 598 - Directed Reading, Research, and Individual Projects Credits: 1-6 (Must register for 3 credits)

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 with an initial licensure component prepares professionals with the knowledge, skills, and professional dispositions needed to teach German to students in grades PK-12. The 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

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
• EDUC 598 - Directed Reading, Research, and Individual Projects Credits: 1-6 (Must register for 3 credits)

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 with an initial licensure component prepares professionals with the knowledge, skills, and professional dispositions needed to teach Japanese to students in grades PK-12. The 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)
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
- EDUC 598 - Directed Reading, Research, and Individual Projects Credits: 1-6 (Must register for 3 credits)

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 with an initial licensure component prepares professionals with the knowledge, skills, and professional dispositions needed to teach Latin to students in grades PK-12. The 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

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
- EDUC 598 - Directed Reading, Research, and Individual Projects Credits: 1-6 (Must register for 3 credits)

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 with an initial licensure component prepares professionals with the knowledge, skills, and professional dispositions needed to teach Russian to students in grades PK-12. The 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

**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
- EDUC 598 - Directed Reading, Research, and Individual Projects Credits: 1-6 (Must register for 3 credits)

**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: Spanish (ESPN)

This 39-credit Foreign Language: Spanish concentration with an initial licensure component prepares professionals with the knowledge, skills, and professional dispositions needed to teach Spanish to students in grades PK-12. The 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

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
- EDUC 598 - Directed Reading, Research, and Individual Projects Credits: 1-6 (Must register for 3 credits)

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.

**Instructional Technology**

Four concentrations with an instructional technology focus provide professionals the specialized knowledge and skills needed to apply a wide range of computer and telecommunications technologies in achieving educational goals within school, community, and corporate or public settings. The concentrations combine current theoretical foundations or technology development and integration with practical, hands-on experiences in using state-of-practice and state-of-the-art technologies. These concentrations serve the various needs and interests of specific types of instructional technology clients: instructional design and development, integration of technology in schools, technology innovations in education, and assistive and special education technology.

▲**Concentration in Assistive and Special Education Technology (IASP)**

**Course Work**

- EDSE 510 - Introduction to Assistive Technology Credits: 3
  or
- EDIT 510 - Introduction to Assistive Technology Credits: 3
- EDSE 526 - Web Accessibility and Design Credits: 3
  or
- EDIT 526 - Web Accessibility and Design Credits: 3
- EDSE 590 - Special Education Research Credits: 3
  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**

Choose 13 credit hours from the following: (8 credits must be selected from direct AT tools courses)

- EDSE 522 - Assistive Technology for Individuals with Sensory Impairments Credits: 2-3
  or
- EDIT 522 - Assistive Technology for Individuals with Sensory Impairments Credits: 2-3
- EDSE 523 - Accessibility/Input Modification Credits: 1-3
  or
- EDIT 523 - Accessibility/Input Modification Credits: 1-3
- EDSE 524 - Assistive Technology for Individuals with Learning Disabilities Credits: 2
  or
- EDIT 524 - Assistive Technology for Individuals with Learning Disabilities Credits: 2
• EDSE 525 - Software for Individuals with Special Needs Credits: 1-2
  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 - Internet as an Assistive Technology Tool Credits: 2
  or
• EDIT 529 - Internet as an Assistive Technology Tool Credits: 2
• EDSE 534 - Communication and Severe Disabilities Credits: 3
• EDSE 622 - Augmentative Communication Credits: 2
  Choose an additional 5 credits from the following:
• 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

Assistive and Special Education Technology elective courses are offered for variable credit each semester. Select 13 credits to meet the elective requirement.

Note

Any EDIT course may be used as an additional elective.

Total: 30 credits

▲Concentration in 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 - Analysis and Design of Multimedia/Hypermedia Environments Credits: 3
• EDIT 732 - Advanced Instructional Design: Constructive Methods Credits: 3
• EDIT 752 - Design and Production of Multimedia and Hypermedia 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 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 - Analysis and Design of Multimedia/Hypermedia Environments Credits: 3
- EDIT 732 - Advanced Instructional Design: Constructive Methods Credits: 3
- EDIT 752 - Design and Production of Multimedia and Hypermedia Learning Environments Credits: 3
- EDIT 791 - Project Development Practicum Credits: 6
- EDIT 792 - Project Development Practicum Credits: 6

**Total: 30 credits**

▲**Concentration in 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)

Total: 36 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 21 credits and requires an additional 9 credits for completion of the MEd. Course work includes integrated fieldwork in schools and all requirements for a Virginia ESOL license PK-12. The convenient schedule enables participants to complete the program through on-campus study during two summers and on-line study during the academic year. On successful completion of course work and passing scores on the required exams, participants are eligible to receive a statement of eligibility from the state. After completing an internship requirement overseas (either one term of student teaching or one year of full-time teaching), candidates are eligible to apply for the ESOL PK-12 Virginia license.

Grading Policy: Students enrolled in this degree program must earn a B or higher in all 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 790 - Internship in Education Credits: 1-6 Optional (Must register for 6 credits)
• EDCI 520 - Assessment of Language Learners Credits: 3
• EDRD 615 - Reading/Writing for Multilingual Students Credits: 3
• EDUC 511 - Introduction to Education in International Schools Credits: 3
• EDUC 537 - Foundations of Multicultural Education Credits: 3
• EDRD 558 - Literacy in the Content Areas, PK-12 Credits: 3

MEd Requirements (6 credits)

• EDCI 521 - Curriculum Development for Language Learners Credits: 3
• EDCI 777 - Research to Practice Credits: 3
Note:

All course work 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 is an alternative teacher licensure program that 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. On successful completion of course work and passing scores on the required exams, participants are eligible to receive a state of eligibility from the state. After completing an internship requirement overseas (either one term of student teaching or one year full-time teaching), candidates are eligible to apply for the elementary PK-6 Virginia license.

Grading Policy: Students enrolled in this degree program must earn a B or higher in all 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
- EDCI 790 - Internship in Education Credits: 1-6 Optional (Must register 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
- EDUC 537 - Foundations of Multicultural Education Credits: 3

Note:

All course work and tests must be finished prior to the internship. Some course work requires field experience.
ESOL Endorsement Requirements for Licensed (In-Service) Teachers

The FAST TRAIN English for Students of Other Languages (ESOL) Licensure Program (PK-12) is specifically designed for prospective teachers and educators who are working abroad or who plan on going overseas to teach and want a license in ESOL.

- 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 615 - Reading/Writing for Multilingual Students Credits: 3
- EDUC 537 - Foundations of Multicultural Education Credits: 3

▲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
- LING 520 - Descriptive Linguistics Credits: 3
  or
  Choose three 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.
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 Studies (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 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 credit)

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
- **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 included 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 33-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 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 616 - Curriculum Development and Evaluation Credits: 3
- EDLE 618 - Supervision and Evaluation of Instruction Credits: 3
- EDLE 791 - Internship in Educational Leadership Credits: 3

Complete five separate 3-credit Math 600 special topics courses as noted below:

- MATH 600 - Special Topics in Mathematics Credits: 1-6
  Number Systems and Number Theory for K-8 Teachers Credits: 3
  Geometry and Measurement for K-8 Teachers Credits: 3
  Probability and Statistics for K-8 Teachers Credits: 3
  Algebra and Functions for K-8 Teachers Credits: 3
  Rational Numbers and Proportional Reasoning for K-8 Teachers Credits: 3

Total: 33 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. Study 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 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 and supervision (PK-12). Students who apply for this licensure must have three years of successful teaching experience in addition to the MEd degree.

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
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.

▲ Concentration in Assessment, Evaluation, and Testing (EDPA)

Course Work

- EDRS 630 - Educational Assessment Credits: 3
- EDUC 598 - Directed Reading, Research, and Individual Projects Credits: 1-6 (Must register for 3 credits)
  or
- EDUC 599 - Thesis Credits: 1-6 (Must register for 3 credits)

Choose two courses from the following:
- EDEP 650 - High-Stakes Assessment and Accountability Systems Credits: 3
- EDEP 651 - Test Design and Interpretation 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
• EDUC 598 - Directed Reading, Research, and Individual Projects Credits: 1-6 (Must register for 3 credits)
or
• EDUC 599 - Thesis Credits: 1-6 (Must register for 3 credits)

Choose two courses from the following:
• EDEP 653 - Culture and Intelligence Credits: 3
• EDEP 654 - Learning, Motivation, and Self-Regulation Credits: 3
• EDSE 667 - Cognitive Development of Diverse Young Children Credits: 3
• EDUC 597 - Special Topics in Education Credits: 1-6 (Must register for 3 credits)

Focus on learning, cognition, or motivation

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)

Students 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 3 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

- EDUC 598 - Directed Reading, Research, and Individual Projects Credits: 1-6 (Must register for 3 credits)
  or
- EDUC 599 - Thesis 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

New Professional Studies, MA

Banner Code: E1-MA-NPST

This 30-credit hour master's degree engages teachers to improve their approach to a wide range of issues connected to the craft of teaching and learning for Pre-K-12 children. 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

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 may also earn a master's degree by completing initial licensure course work in conjunction with master's degree core courses.

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.

Course Work

MEd Requirements (17 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
- EDSE 791 - Midpoint Portfolio Credits: 1
- EDSE 792 - Final Portfolio Credits: 1
Note:

EDSE 782 - *Comprehensive Topics in Special Education: Trends and Issues* may be substituted for EDSE 791 and EDSE 792 for students seeking the MEd in Special Education without licensure. Students seeking licensure in conjunction with the MEd in Special Education must complete EDSE 791 and EDSE 792.

Electives (13 credits)

- Choose 13 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.

Course Work (17 credits)

- EDSE 505 - Introduction to Early Childhood Special Education Credits: 3
- 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 665 - Families of Children with Special Needs Credits: 3
- EDSE 791 - Midpoint Portfolio Credits: 1
- EDSE 792 - Final Portfolio Credits: 1

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 (13 credits)

- Choose 13 credits from graduate EDSE- or EDUT-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.

Course Work

- 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

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.

Course Work

- EDSE 510 - Introduction to Assistive Technology Credits: 3
  or
- EDIT 510 - Introduction to Assistive Technology Credits: 3
- EDSE 610 - Designing Adaptive Environments Credits: 2
Electives

Choose 10 credits from the following:

- EDIT 522 - Assistive Technology for Individuals with Sensory Impairments Credits: 2-3
- EDIT 523 - Accessibility/Input Modification Credits: 1-3
  or
- EDSE 523 - Accessibility/Input Modification Credits: 1-3
- EDIT 524 - Assistive Technology for Individuals with Learning Disabilities Credits: 2
  or
- EDSE 524 - Assistive Technology for Individuals with Learning Disabilities Credits: 2
- EDIT 525 - Software for Individuals with Special Needs Credits: 1-2
  or
- EDSE 525 - Software for Individuals with Special Needs Credits: 1-2
- EDIT 526 - Web Accessibility and Design Credits: 3
  or
- EDSE 526 - Web Accessibility and Design Credits: 3
- EDIT 529 - Internet as an Assistive Technology Tool Credits: 2
  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

Assistive Technology elective courses are offered for variable credit each semester. Select 10 credits to meet the elective requirement.

Total: 15 credits

ASTL: Alternative Education Graduate Certificate

Banner Code: E1-CERG-AALT

This 18-credit certificate is designed for professionals who are interested in or are working in alternative education settings. It offers the knowledge and skills necessary to work effectively with at-risk students, their families, and involved agencies.

Course Work

- EDAE 600 - Alternative Education for At-Risk Youth Credits: 1
- EDAE 601 - Curriculum and Methods in Alternative Education Credits: 3
- EDAE 602 - Preparing Students for Employment and Living Independently Credits: 2
- EDSE 551 - Classroom Management: Theory and Practice Credits: 3
- EDAE 603 - Communication and Management Strategies for Alternative Education Credits: 3
- EDAE 604 - Multidisciplinary and Interagency Collaboration Credits: 3

Electives
Choose 3 credits with advisor approval

Total: 15 credits

ASTL: Art Education Graduate Certificate

Banner Code: E1-CERG-AART

The 18-credit art education certificate is designed for art teachers with current licensure in art PK–12. It consists of six required courses that address contemporary professional development content areas in art education.

Course Work

- AVT 605 - Issues and Research in Art Education Credits: 3
- AVT 694 - Advanced Studies in Teaching Critical Response to Art, PK–12 Credits: 3
- AVT 615 - Technology for Art Teachers Credits: 3
- AVT 697 - Advanced Strategies and Curricular Innovations in the Visual Arts Credits: 2
- EDEP 601 - Creativity and Cognition in the Arts and Media Credits: 3

Studio Course

Choose one studio course from the following:

- AVT 667 - Two-Dimensional Art Making: Form, Theme, and Context Credits: 4
- AVT 668 - Three-Dimensional Art Making across Cultures Credits: 4
- AVT 669 - Four Dimensional Art Making: Technology and New Media Credits: 4

Note:
AVT 615 is considered a 3-credit studio course. Qualified students who test out of this course should choose two of the above four-credit studio courses.

Total: 18 credits
ASTL: Early Childhood Education Graduate Certificate

Banner Code: E1-CERG-AECE

This 18-credit certificate is designed for early childhood professionals who work in various roles with young children and their families. It focuses on the practice and study of early childhood education and is based on the early childhood generalist standards of the National Board for Professional Teaching Standards.

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 nine credits 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

ASTL: Foreign Language French Graduate Certificate

Banner Code: E1-CERG-AFLS

This 18-credit certificate is for practicing teachers who wish to deepen their expertise in French and augment their teacher development through course work in advanced pedagogy that is aligned with the propositions of the National Board for Professional Teaching Standards.

Course Work

Literature
Choose six credits from the following:

- FREN 515 - Medieval French Literature Credits: 3
- FREN 517 - Studies in Seventeenth-Century Literature Credits: 3
- FREN 518 - Studies in Eighteenth-Century Literature Credits: 3
- FREN 519 - Studies in Nineteenth-Century Literature Credits: 3
- FREN 525 - Studies in Modern French Literature Credits: 3
- FREN 550 - Special Topics Credits: 3

Note:

Courses may be substituted with advisor-approved literature-related electives in French.

Language and Linguistics

Choose six credits from the following:

- FREN 560 - History of the French Language Credits: 3
- FREN 575 - Grammatical Analysis Credits: 3
- FREN 576 - Advanced Translation Credits: 3

Note:

Courses may be substituted with advisor-approved language- and linguistics-related electives.

Electives

Choose six credits from the following:

- FREN 580 - Contemporary French Society and Culture Credits: 3
- 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

ASTL: Foreign Language Spanish Graduate Certificate

Banner Code: E1-CERG-AFLS

This 18-credit certificate is for practicing teachers who wish to deepen their expertise in Spanish and augment their teacher development through course work in advanced pedagogy that is aligned with the propositions of the National Board for Professional Teaching Standards.

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

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

ASTL: Geography Graduate Certificate

Banner Code: E1-CERG-AEEO

This 21-credit certificate provides a professional specialization in geography for practicing teachers. Students completing this certificate fulfill the requirements for add-on endorsement in geography for currently licensed teachers.

Course Work

- GEOG 520 - Geography for Teachers Credits: 3
- GEOG 533 - Issues in Regional Geography Credits: 1-6 (Must register for 3 credits)
- GEOG 550 - Geospatial Science Fundamentals Credits: 3
- GEOG 603 - Geographic Perspectives of Complex Natural Resource Management Topics Credits: 3
- GEOG 690 - Advanced Practicum in Geographical Applications Credits: 1-6 (Must register for 3 credits)

Electives

Choose six credits from the following:

- GEOG 505 - Transportation Geography Credits: 3
- GEOG 553 - Geographic Information Systems Credits: 3
- GEOG 563 - Advanced Geographic Information Systems Credits: 3
- GEOG 581 - World Food and Population Credits: 3
- GEOG 590 - Selected Topics in Geography and Cartography Credits: 3

Total: 21 credits

ASTL: 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.

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).

Total: 21 credits

ASTL: History Graduate Certificate

Banner Code: E1-CERG-AHIS

This 18-credit certificate is designed for PK–12 classroom teachers who wish to gain depth in history content to become leaders in their discipline.

Course Work

- GEOG 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: 3

Note

Courses may be substituted with advisor-approved history electives.

Total: 18 credits
ASTL: Literacy: PK-12 Classroom Teachers Graduate Certificate

Banner Code: E1-CERG-AP12

This 18-credit certificate includes three required literacy courses and three approved electives in ESOL, special education, psychology, secondary and elementary education, early childhood, writing, and other areas. Teachers (PK-12) in any discipline, will learn about theory and strategies in literacy and reading.

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 four courses 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
- EDSE 662 - Consultation and Collaboration Credits: 3
- EDSE 627 - Assessment Credits: 3

Total: 18 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.

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  

Total: 21 credits 

ASTL: Mathematics (Middle/Secondary) Graduate Certificate 

Banner Code: E1-CERG-AMTH  

This 18-credit certificate 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
ASTL: Physical Education Graduate Certificate

Banner Code: E1-CERG-APED

This 18-credit certificate program is designed for professionals who are interested in enhancing and promoting teacher knowledge, abilities, and status as educators and professional leaders in physical education.

Course Work

- 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 553 - Teaching Creative Movement Credits: 3
- DANC 580 - Laban Movement Analysis Credits: 3
- EDIT 705 - Instructional Design Credits: 3
  or
- EDCI 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 606 - Foundations of Exercise, Fitness, and Health Promotion 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

Note:

An alternative elective may be chosen with advisor approval

Total: 18 credits
ASTL: Science Graduate Certificate

Banner Code: E1-CERG-ASCI

This 18-credit certificate provides course work in the area of science related to the Virginia Standards of Learning. Students are prepared to be lead teachers on either of two levels: K–6 or 6–12.

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 six credits of science course work relevant to school-level, with advisor approval

Total: 18 credits

ASTL: Teacher Leadership Graduate Certificate

Banner Code: E1-CERG-ATL

This 18-credit certificate provides practicing teachers with course work in educational leadership that can be applied in their school settings.

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

Counseling Licensure Post-Master's Graduate Certificate
This 15-credit certificate is designed for individuals who possess a master's degree in counseling or a highly-related field. Students completing this certificate fulfill the Virginia licensure requirements for school counselor or licensed professional counselor.

Students pursue either Virginia School Counselor or Licensed Professional Counselor course work.

Course Work

Virginia School Counselor

Choose 15 credits from the following:

- 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

Students individually tailor their coursework with an advisor to meet licensure requirements. EDCD 791 Internship in Counseling is offered for variable credit each semester. Register for the number of credits needed to meet the 15 credit hour requirement.

Total: 15 credits

Licensed Professional Counselor

Choose 15 credits from the following:

- 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

Students individually tailor their coursework with an advisor to meet licensure requirements. EDCD 791 Internship in Counseling is offered for variable credit each semester. Register for the number of credits needed to meet the 15 credit hour requirement.
Total: 15 credits

E-Learning Graduate Certificate

Banner Code: E1-CERG-ELRN

This 15-credit certificate provides professionals with the specialized knowledge and skills needed to apply today’s Internet and web-based technologies to educational and training goals within school, community, and corporate settings. Courses are delivered in on-line, face-to-face, and blended formats that model e-learning delivery modes.

Course Work

- EDIT 526 - Web Accessibility and Design Credits: 3
- EDIT 611 - Innovations in Distance Learning Credits: 3
- EDIT 705 - Instructional Design Credits: 3

Electives

Choose six 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 - Introduction to Multimedia/Hypermedia Credits: 1-3
- EDIT 772 - Web-Based Instructional Tools Credits: 1-3

E-Learning elective courses are offered for variable credit each semester. Select 6 credits to meet the elective requirement.

Total: 15 credits

Early Childhood Special Education Licensure Graduate Certificate

Banner Code: E1-CERG-SPEC

This 37-credit certificate offers required course work for teacher licensure (Virginia) in early childhood special education.
Course Work

- EDSE 505 - Introduction to Early Childhood Special Education 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 558 - Medical Aspects of Physical and Sensory Disabilities in Young Children Credits: 3
- EDSE 615 - Early Intervention for Infants and Toddlers with Disabilities: Collaborative and Consultative Approaches Credits: 3
- EDSE 633 - Policy Perspectives Affecting Diverse Young Learners Credits: 3
- EDSE 656 - Assessment of Diverse Young Learners Credits: 3
- EDSE 657 - Curriculum and Methods: Early Childhood Special Education Credits: 3
- EDSE 665 - Families of Children with Special Needs Credits: 3
- EDSE 790 - Internship in Special Education Credits: 1-6
  (Two internship experiences required. First experience register for 3 credits, second experience register for 2 credits)
- EDSE 791 - Midpoint Portfolio Credits: 1
- EDSE 792 - Final Portfolio Credits: 1
- EDUT 511 - Developmental Pathways of Diverse Learners, Birth-Adolescence Credits: 3

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: 37 credits

English as a Second Language (ESL/ESOL)/Special Education Graduate Certificate

Banner Code: E1-CERG-ELSE

This 18-credit certificate offers course work for students and professionals seeking crossover training in ESL/ESOL and special education.

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
- 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 27-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.

**Course Work**

- EDUC 537 - Foundations of Multicultural Education Credits: 3
- EDUC 539 - Human Development and Learning PK-12 Credits: 3
- 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 615 - Reading/Writing for Multilingual Students Credits: 3
- EDCI 790 - Internship in Education Credits: 1-6 (Must register for 6 credits)

Total: 27 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.
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

Note

Upon completion of all requirements and documentation of one year of teaching in an IB authorized school, candidates are eligible for the Level II Teacher Award 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.

Course Work

- 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

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.

Course Work

- 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

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.

Course Work

- 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
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.

**Course Work (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 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.

**Course Work**
• EDSE 743 - Leadership in Special Education Administration Credits: 3
• EDSE 744 - Current Issues in Special Education Credits: 3

Electives

Choose nine 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 Certificate

Banner Code: E1-CERG-SDAC

This 36-credit hour certificate offers required course work for teacher licensure in Special Education: Adapted Curriculum to be completed with 15 to 36 credits based on the number of equivalent courses completed prior to enrollment.

Course Work

• 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 two 2-credit internships: one elementary placement; one secondary placement)
• EDSE 791 - Midpoint Portfolio Credits: 1
• EDSE 792 - Final Portfolio Credits: 1

Total: 36 credits
Exit Requirement

Students enrolled in the Students with Disabilities who Access the Adapted Curriculum 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 teacher licensure for individuals who will be working with students with disabilities who access the general curriculum.

Course Work

- 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; one secondary placement)
- EDSE 791 - Midpoint Portfolio Credits: 1 Must be taken concurrently with the fourth or fifth special education course.
- EDSE 792 - Final Portfolio Credits: 1 Must be taken concurrently with last special education course.

Total: 33 credits

Teaching Students with Autism Graduate Certificate

Banner Code: E1-CERG-ETSE
This 15-credit 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.

**Course Work**

- 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

**Visual Impairments Licensure, PK-12 Graduate Certificate**

*Banner Code: E1-CERG-VILI*

This 32-credit certificate is designed for students seeking initial teacher licensure (Virginia) in visual impairments (PK–12).

**Course Work**

- 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 two 2-credit internships: one elementary experience; one secondary experience)
- EDSE 791 - Midpoint Portfolio Credits: 1
- EDSE 792 - Final Portfolio Credits: 1

Total: 32 credits

**Doctoral Degree**
Education, PhD

Banner Code:  E1-PHD-EDUC

The PhD in Education provides advanced professional education for experienced practitioners pursuing or planning careers in educational settings. The program requires 85–96 credits beyond the baccalaureate degree or a minimum of 55–66 credits beyond the master’s degree. A student’s individual credit requirement depends on goals, program requirements, and previous preparation. A limited number of graduate credits taken previously may be applied; however, a student’s total program typically requires 10 more credits than the minimum requirements.

With the guidance of faculty, students develop individual programs of study in concert with their goals, program requirements, and self-assessed skills and knowledge. Each student’s program must include study in a professional field, such as education administration, educational psychology, instructional technology, special education, curriculum, instruction, international education, bilingual education, counseling and development, early childhood education, or literacy. The specific nature of courses is determined by the student in conjunction with a faculty doctoral advising committee after completing two semesters. Students also complete a secondary emphasis of study consisting of 12 credits.

To complete the PhD program, each student must demonstrate competence in oral and written English, computer literacy, 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. Students demonstrate these competencies by successfully completing courses, seminars, and a doctoral portfolio, and preparing and orally defending a doctoral dissertation. Students have five years from the time they enroll in their first class to complete all course work and the doctoral portfolio. Five additional years, starting with the date on which students are advanced to candidacy, are allowed to complete the dissertation.

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 or master’s degree from an accredited institution
- Demonstrate high intellectual capability
- Demonstrate leadership potential
- Three letters of recommendation
- GRE general test scores and the writing assessment
- Written goals statement relating study in the PhD program to educational and career plans

For more information, call the PhD in Education Program Office at 703-993-2011.

Completed applications must be submitted to the CEHD Graduate Admissions Office by February 1 for summer or fall admission, or by September 1 for spring admission.

Course Work

General Culture (8 credits)

- EDUC 800 - Ways of Knowing Credits: 3
- EDUC 802 - Leadership Seminar Credits: 3
- EDUC 805 - Research and Scholarship in Education Credits: 2
Research Methods (12 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

Electives

Choose one course 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

Professional Specialization (21 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, instructional technology, literacy and reading, mathematics or science education leadership, multilingual or multicultural education (English as a second language), research methodology, special education, and teaching and teacher education.

Note:

Students enroll in one to three internships designed to broaden their professional expertise. One internship must be taken in a setting that differs from the student’s work setting.

Secondary Emphasis (12 credits)

Students have a number of options for developing a secondary emphasis including course work offered within CEHD and/or other Mason units. Master's degree course work may also be used to fulfill secondary emphasis requirements.

Dissertation (12 credits)

- EDUC 998 - Doctoral Dissertation Proposal Credits: 1-3 (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 a minimum of 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)

Total: 65 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
- School of Nursing
- Social Work

The mission of the College of Health and Human Services (CHHS) is to equip professionals to provide leadership, care, and services related to health promotion, wellness, disease prevention, and quality of life through the promotion of physical, social, and environmental health practices. Graduates practice in a variety of roles in settings that are complex, multicultural, and dynamic. The college is a resource for health promotion to the university, as well as to citizens of Virginia.

The State Council of Higher Education for Virginia and the State Board of Nursing approved the baccalaureate nursing program in 1974. Since then, the program has grown from a department of nursing to a school of nursing. In 1993, the school was reorganized into the College of Nursing and Health Science, and in 2006, into the College of Health and Human Services to provide the breadth needed to respond to dramatic and dynamic fundamental changes occurring in health care and social work. The expanded, multidisciplinary CHHS 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.

Administration

Shirley Travis, Dean
Keith Howell, Associate Dean, Research and Program Evaluation
J. Goodlett McDaniel, Associate Dean, Practice, Marketing, and Finance
Robin Remsburg, Associate Dean and Director, School of Nursing
Frank J. Whittington, Associate Dean, Academic Affairs
Susan J. Swett, Assistant Dean, Student Affairs
P. J. Maddox, Chair, Health Administration and Policy
Lisa Pawloski, Chair, Global and Community Health
Miriam Raskin, Acting Chair, Social Work

Faculty

Faculty emeriti: Ailinger, Boyd, Brenkus, Carty, Jenkins, Johnson-Brown, Langley, Parker-Smith, Redmond, Silva, Vail, Walker

Professors: Butler, Gaffney, Gerber, Hadley, Howell, Maddox, Meiners, Metcalf, Moore, Raskin, Remsburg, Ritchie, Rose, Sluzki, Sorrell, Travis, Whittington

Assistant professors: Boland, Carle, Cartwright, Cleaveland, Gewa, Hahn, Ihara, Jacobsen, Kitsantas, Kodadek, Maradiegue, Miklancie, Moss, Oh, Perlin, Roberts, Rudowski, Smoczynski, Tompkins, Urban, Webster, Weinstein, Willis, Winter, Wojtusiak, Yang, Young, Zhou

Instructors: Almond, Blasser, Campo, Clark, Cox, Davis, Dickman, Durham, Freeborne, Gaston, Gillette, Henderson, Liss, Middle, Mulqueen, Shiver, Stoehr, Toulouse, Venske, Welsh

Course Work

CHHS offers all course work designated GCH, HAP, HHS, NURS, and SOCW in the Courses chapter of this catalog.

Academic Programs

The College of Health and Human Services is dedicated 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 the Commonwealth of Virginia, and these graduates have one of the state’s highest pass-rates on the nursing licensure exam. Through the PhD program in nursing, CHHS is helping fill the need for nursing faculty and researchers. The College’s Department of Health Administration and Policy prepares students for careers as leaders and managers of health care organizations and as health policy-makers at both 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 both local and international populations. The Department of Social Work educates both undergraduate and graduate students to be professional social workers able to work in either community organization or clinical settings. These academic units offer a variety of specializations within degree programs, including nutrition, gerontology, rehabilitation science, 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, 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 provides support to students, faculty and staff on a variety of admissions, academic, and policy issues. The office is involved with recruiting new students; pre-admission advising; processing applications for graduate programs and Nursing BSN programs (junior-level admission to the BSN pathways, and the accelerated second-degree BSN); and conducting orientations for newly-admitted students.

Student Affairs maintains the college’s student records; reviews and recommends action on undergraduate and graduate 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, described in the Academic Policies section of the catalog.

Each student is assigned an academic advisor with whom he or she should meet at least once a semester to insure program graduation requirements are met. The assigned advisor may be a faculty member, a departmental advisor, or an advisor in the Office of Student Affairs.
Student Responsibility

Students are required to have an active Mason e-mail account, and to update any change of address on-line through Patriotweb. The college will not use personal (non-GMU) e-mail addresses to communicate with students. Students are responsible for knowing the university academic policies and the policies governing their program as stated in the university catalog, and should regularly monitor their Mason transcript on-line and their degree progression through the degree evaluation tool on Patriotweb [link to https://patriotweb.gmu.edu/].

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 placed in 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 regulations established by the Commonwealth of Virginia and the agencies to which students are assigned and to minimize risks to student health, every student enrolled in a CHHS program requiring clinical or practicum coursework must document and submit evidence of good health and provide current immunization records to both the CHHS Office of Student Affairs and 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.

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. 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 also considered agents of the university. They are covered 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: 703-993-1926 (Undergraduate programs)
Phone: 703-993-1947 (Master's programs)
Phone: 703-993-1961 (Doctoral program)
Web: nursing.gmu.edu

Faculty

Emeriti: Ailinger, Boyd, Brenkus, Carty, Jenkins, Johnson-Brown, Langley, Paker-Smith, Redmond, Silva, Vail, Walker

Professors: Gaffney (assistant dean, doctoral studies), Milligan, Moore (assistant dean, nursing research), Remsburg (associate dean/director), Sorrell, Travis (dean)

Associate Professors: Cangelosi, Chong, Davidson, Douglas, Mahon, McDaniel (associate dean, business development), Normile, Panniers, Ternus (academic outreach director), Wu

Assistant Professors: Boland, Hahn (assistant dean, masters/post masters division), Kodadek, Maradiegue, Miklanci, Moss, Oh, Roberts, Smoczynski, Urban (assistant dean, undergraduate division), Willis, Young, Zho

Instructors: Almond, Blasser, Campo, Cox, Davis, Dickman, Durham, Liss, Middle, Mulqueen, Stoehr, Toulouse, Venzke, Welsh

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.

Undergraduate Degree

Nursing, BSN

Banner Code: HH-BSN-NURS

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 services, and preparation for the managerial responsibilities of nursing.
The School of Nursing offers four 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. The LPN-to-BSN pathway is offered for students holding current LPN licenses and is also a two-year curriculum following completion of general education and prerequisite requirements. An accelerated RN-to-BSN pathway for students holding current registered nurse (RN) licenses can be completed in one year (full-time) following completion of general education and prerequisite requirements. The accelerated, second degree pathway is a 15-month, full-time pathway for students holding a baccalaureate degree outside of nursing. The nursing programs must be completed on a full-time basis. Students who are interested in pursuing a major in nursing, with the exception of those currently licensed as RNs, must make an additional and separate application through the School of Nursing and are encouraged to contact the nursing program for advising prior to applying to the nursing major.

Clinical nursing begins at the junior level. Students must complete a prenursing curriculum and be admitted to junior standing or one of the accelerated pathways. These conditions do not apply to students who are already RNs.

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 course in their major's designated “writing intensive” at the 300 level or above. Students majoring in nursing fulfill this requirement by successfully completing HHS 465.

**Academic Grade Standards**

After Admission to junior-standing and the nursing program, students who get a grade lower than a C in a required nursing (NURS or HHS) course must repeat the course and earn a grade of C or higher to resume progression in nursing coursework. This may alter or halt further progression in the nursing program and affect the expected graduation date. Students may repeat a nursing course in which they earned a grade lower than C only one time. Those who fail to earn a C or higher after repeating the course are dismissed from the BSN program. Those who earn a grade of c or higher may resume progress in required coursework. Earning a grade of less than C in a second nursing course results in dismissal from the nursing program.

Dismissal from any one one of the nursing pathways constitutes dismissal from the undergraduate (BSN) nursing program in the School of Nursing. The student has the right to appeal.

**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**

Faculty members in the nursing program are generally the best judges of a student’s professional performance; however, some students may feel that the faculty member’s judgment of readmission or dismissal 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.

Students wishing to appeal a dismissal must submit a letter of request to the Director of Nursing and provide rationale for the appeal.

**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 towards the end of the program to provide guidance to the student concerning their chance for success on the licensing exam. A final critical thinking and test-analysis course is required for 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, NCLEX-readiness preparation, uniforms, stethoscope, name pin, books, CPR certification, health forms, immunizations, and criminal background check fees. The availability of personal transportation to and from clinical agencies is expected 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, Immunization Requirements in the GMU catalog. In addition, the School of Nursing, in meeting the requirements of its clinical agency partners requires that two out of three injections of the series of hepatitis B immunizations must be completed before beginning the first clinical course, with the third immunization completed as it is due. **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.** Students must also have an annual tuberculosis screenings by PPD or as determined by a health care provider in the case of past positive tests. All immunizations and expenses of screenings are the responsibility of the student. The School of Nursing reviews health records and reserves the right to refuse admission or continued enrollment to the School of Nursing 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. Either the American Red Cross Professional Rescuer or 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.

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 student are expected to practice Universal Precautions with all clients and failure to do so will result in dismissal from the program. 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 and LPN Requirements**

RN and LPN licensed students enrolled in those pathways are required to submit a copy of their current license prior to entering the first nursing course. RN and LPN-licensed students must maintain current licensure throughout the academic program.

**Degree Requirements**

**General Education (30 credits)**

**Written Communication:**
• ENGL 101 - Composition Credits: 3
• ENGL 302 - Advanced Composition Credits: 3

Note:

Non-native speakers of English with limited proficiency in the language may substitute ENGL 100 for ENGL 101. Students must attain a minimum grade of C in ENGL 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:

• IT 103 - Introduction to Computing 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. International Health (GCH 205) is recommend.

Social Science:

• PSYC 100 - Basic Concepts in Psychology Credits: 3

Choose one of the following:
Designated Nursing Prerequisites (24 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

**Ethics:**
- PHIL 151 - Introduction to Ethics Credits: 3
  or
- PHIL 309 - Bioethics Credits: 3

**Statistics:**
- STAT 250 - Introductory Statistics I Credits: 3

**Human Lifespan Development:**
- PSYC 211 - Developmental Psychology Credits: 3

**Nutrition:**
- GCH 295 - Nutrition for Health Professionals Credits: 3

BIOL 124 and 125 meet the natural science general education requirement. Statistics 250 fulfills the quantitative reasoning general education requirement.

**Electives (4 credits)**

No more than 3 credits of non-required NURS-prefix nursing electives may be used to satisfy this requirement.

**Traditional BSN Pathway (62 credits)**

To be eligible to apply for junior standing, traditional prenursing students must complete the designated nursing prerequisites by the end of the spring semester preceding entry to the nursing program. Students must earn a C or better in anatomy and physiology (BIOL 124 and 125, 8 credits); microbiology (BIOL 246 and 306, 4 credits); statistics (STAT 250, 3 credits); nutrition (GCH 295, 3 credits); developmental psychology (PSYC 211, 3 credits); and ethics (PHIL 151 or 309, 3 credits). All university general education requirements, with the exception of ENGL 302, must be completed by the end of the summer semester preceding entry into the nursing program.

**Traditional BSN Major, Required Courses**

- NURS 330 - Nursing Fundamentals Credits: 3
- NURS 331 - Nursing as a Process for Health Practicum Credits: 2
NURS 332 - Concepts of Health Promotion and Disease Prevention throughout the Lifespan 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 357 - Health Promotion and Disease Prevention in Medical/Surgical Nursing 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
HHS 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 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.

▲ LPN-to-BSN Nursing Pathway (LPN): 62 credits

To be eligible to apply for junior standing, students who hold an LPN (Licensed Practical Nurse) license must complete the designated nursing prerequisites and general education requirements by the end of the spring semester preceding entry to the nursing program. Students must earn a C or better in anatomy and physiology (BIOL 124 and 125, 8 credits); microbiology (BIOL 246 and 306, 4 credits); statistics (STAT 250, 3 credits); nutrition (GCH 295, 3 credits); developmental psychology (PSYC 211, 3 credits); and ethics (PHIL 151 or 309, 3 credits). Applicants to the second degree pathway must achieve a minimum GPA of 3.00 in the designated prerequisite course work.
LPN-to-BSN Concentration, Required Courses

- NURS 334 - Nursing as a Health Profession and Discipline Credits: 3
  Credit by Exam: Upon successful completion of NURS 334, LPN students will be awarded 5 additional credits in nursing.
- 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 357 - Health Promotion and Disease Prevention in Medical/Surgical Nursing 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 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
- HHS 465 - Examination and Integration of Professional and Health Care Issues Credits: 3

Total: 120 credits

▲ Accelerated, Second Degree BSN Pathway (SEC): 47 credits

The Accelerated, Second Degree BSN Pathway is designed for students already holding a bachelor's degree who are interested in pursuing an undergraduate degree in nursing. Students must have a baccalaureate degree from an accredited college or university. This full-time accelerated program begins in the fall semester and is completed in 12 months. Students must earn a C or better in anatomy and physiology (BIOL 124 and 125, 8 credits); microbiology (BIOL 246 and 306, 4 credits); statistics (STAT 250, 3 credits); nutrition (GCH 295, 3 credits); developmental psychology (PSYC 211, 3 credits); and ethics (PHIL 151 or 309, 3 credits). Applicants to the second degree pathway must achieve a minimum GPA of 3.00 in the designated prerequisite course work.

Admission to the second degree nursing program is competitive. Students must have a minimum cumulative GPA of 2.75 in their first degree or a 3.00 GPA in the last 30 credits of the undergraduate degree. They also must complete the application including an intentional essay. To be eligible to apply to this program, students must complete the designated nursing prerequisites by the end of the spring semester preceding entry into the nursing program.
The application deadline is February 1, and students are notified of their status in June. Permission to register for courses with NURS prefixes requires prior acceptance into junior standing in nursing.

Second Degree Pathway, Alternative BSN Requirements

Candidates for the degree must present at least 120 credits:

- General Education: 49 credits are transferred from the first degree. Mason general education requirements are satisfied by the initial degree and fulfilled through transfer credit.
- 24 credits are required prerequisites;
- 47 credits are required for the concentration. Specific requirements are as follows:

Second Degree Concentration, Required Courses

- 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
- HHS 465 - Examination and Integration of Professional and Health Care Issues Credits: 3

Total: 120 credits

▲ Accelerated RN-to-BSN Pathway (RN): 27 credits

Students who hold current RN licenses need to apply only to the university. The Accelerated RN-to-BSN Pathway allows RNs to progress quickly through the program 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 nursing prerequisites.

RN-to-BSN Pathway, Alternative BSN 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;
- 27 credits specific to the concentration, described below;
- 9 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.

**Designated RN-BSN Nursing 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
  - Ethics:
    - PHIL 151 - Introduction to Ethics Credits: 3
    - or
    - PHIL 309 - Bioethics Credits: 3
  - Statistics:
    - STAT 250 - Introductory Statistics I Credits: 3

**RN-to-BSN Concentration, Required Courses**

- 3 credit 400- or 500-level nursing elective
- NURS 334 - Nursing as a Health Profession and 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 441 - Nursing of Clients in Communities and Large Groups Credits: 5
- NURS 442 - Case Studies in Community Health Nursing Credits: 1
- NURS 453 - Research in Nursing Credits: 3
- HHS 465 - Examination and Integration of Professional and Health Care Issues Credits: 3

**Electives (9 credits)**

- No more than 3 credits of nursing electives may be used to satisfy this requirement.
Credit by Exam (33 credits)

On successful completion of NURS 334, RN students will be awarded 30 credits in nursing and 3 credits of nutrition.

Total: 120 credits

Dual Degree

Nursing, MSN/MBA

Banner Code: HH-MSNBA-NBA

The MSN/MBA Program, offered with the School of Management (SOM), prepares nurses for mid- and top-level administrative, leadership, and health policy roles in health and health-related organizations. A variety of health care and health-related settings are used for clinical practice experiences. The program requires 58 graduate credits, including graduate nursing, business, decision sciences, and elective courses.

Applicants must have GMAT scores sent directly to Mason and must meet admission requirements for graduate degree status in both CHHS and SOM.

Degree Requirements

MSN Courses

- HAP 703 - Financial Management in Health Systems Credits: 3
- NURS 660 - Seminar in the Ethics of Health Care Credits: 3
- NURS 680 - Theoretical Foundations Related to Nursing Credits: 2
- NURS 685 - Advanced Nursing Research Methods Credits: 3
- NURS 686 - Projects in Nursing Research Credits: 2
- NURS 688 - Organization of Nursing and Health Care Delivery Systems Credits: 3
- 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

MBA 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 673 - Legal Environment for Management Credits: 1.5
MBA 678 - Strategy and Organizational Leadership Credits: 3

Total: 58

Master's Degree

Nursing, MSN

Banner Code: HH-MSN-NURS

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, adult/gerontological, and family nurse practitioner primary care concentrations are part of a collaborative program with George Washington University School of Medicine and Health Sciences. These concentrations have been approved by the state boards of nursing and medicine in Virginia. The concentration in advanced clinical nursing prepares nurses to provide and manage care of individuals, families, and groups, including the chronically ill, the elderly, and others with self-care limitations. 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. The clinical nurse leader concentration prepares nurses as generalists with solid foundations in health policy and finance to provide competent care and clinical leadership within the health care system.

Admission Requirements

In addition to meeting graduate admission requirements, applicants to MSN programs must have a cumulative GPA of 3.00 for the last 60 credits of undergraduate work, hold an active license as a registered nurse (RN), and submit two letters of recommendation, a résumé, and a goals statement. Although the GRE is not formally required, applicants may be asked to submit GRE scores at the discretion of the school when it believes those scores will lead to a clearer presentation of the applicant’s qualifications. Applicants must have successfully completed undergraduate statistics and a graduate bivariate statistics course (HHS 597).

Students applying to the advanced clinical nursing, clinical nurse leader, nurse educator, and all the nurse practitioner concentrations must have a health assessment skills continuing education course within 18 months prior to taking NURS 514 or 719. In addition, applicants to the nursing administration concentration are required to have the equivalent of one year’s experience in direct patient care as a registered nurse. Students applying to any nurse practitioner concentration are required to have a minimum of one year experience in direct patient care. It is recommended that students applying to the advanced clinical nursing concentration have the equivalent of one year’s experience in direct patient care as an RN.

Special Requirements

Graduate students are required to have annual health exams and immunizations before enrolling in practicum courses. Students must be in the process of completing a hepatitis B immunization series when they enroll for their first practicum course. Student
health and immunization records are monitored at the CHHS Office of Student Affairs. Criminal background checks are required of all School of Nursing students. All students are required to have an active Mason e-mail account.

Degree Requirements

The master’s program in nursing requires 37 to 48 graduate credits. Of these, a 13-credit core consists of course work in the theoretical foundations of nursing, applications in nursing research, a seminar in the ethics of health care, and a course on the organization of nursing and health care delivery systems. The remaining credits are satisfied by completing one of seven concentrations. The nursing administration concentration requires; the clinical nurse leader concentration, an additional 25 credits; the nurse educator concentration, an additional 26 credits; the advanced clinical nursing concentration, an additional 26 to 32 credits; the adult nurse practitioner concentration, an additional 29 credits; and the adult/gerontological and family nurse practitioner concentrations, an additional 35 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.

Actual clinical hours may exceed those listed in the catalog. Actual clinical hours will meet those required for certification purposes. Credits listed in the catalog reflect the minimum required credits.

MSN Core Courses (required of all students): 13 credits

- NURS 660 - Seminar in the Ethics of Health Care Credits: 3
- NURS 680 - Theoretical Foundations Related to Nursing Credits: 2
- NURS 685 - Advanced Nursing Research Methods Credits: 3
- NURS 686 - Projects in Nursing Research Credits: 2
- 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)

Required Courses (17 credits)

- NURS 623 - Clinical Concepts in Community-Oriented Primary Care Credits: 3
- NURS 746 - Practicum in Adult Primary Care Nursing Credits: 6
- NURS 748 - Practicum in Adult Primary Care Nursing II Credits: 8

Nurse Practitioner Support Courses (12 credits)

These required courses are colisted with George Washington University (GWU) School of Medicine and Health Sciences.

Note: All courses offered at GWU are charged at GWU’s tuition rates. Nurse practitioner students must have taken a continuing education health assessment course with a skills component within 18 months of taking NURS 719.
- NURS 719 - Advanced Health Assessment Credits: 2
- NURS 723 - Clinical Decision Making Credits: 2
- NURS 745 - Pharmacology Credits: 3
- NURS 747 - Pharmacology in Disease and Pathophysiology Credits: 1
- NURS 756 - Advanced Pathology and Pathophysiology Credits: 4

Total: 29 credits

▲ Adult/Gerontological Nurse Practitioner in Primary Care Concentration (AGNP)

Required Courses (23 credits)

- NURS 623 - Clinical Concepts in Community-Oriented Primary Care Credits: 3
- NURS 746 - Practicum in Adult Primary Care Nursing Credits: 6
- NURS 748 - Practicum in Adult Primary Care Nursing II Credits: 8
- NURS 780 - Practicum in Gerontological Nursing I Credits: 3
- NURS 781 - Practicum in Gerontological Nursing II Credits: 3

Nurse Practitioner Support Courses (12 credits)

These required courses are colisted with George Washington University (GWU) School of Medicine and Health Sciences.

Note: All courses offered at GWU are charged at GWU’s tuition rates. Nurse practitioner students must have taken a continuing education health assessment course with a skills component within 18 months of taking NURS 719.

- NURS 719 - Advanced Health Assessment Credits: 2
- NURS 723 - Clinical Decision Making Credits: 2
- NURS 745 - Pharmacology Credits: 3
- NURS 747 - Pharmacology in Disease and Pathophysiology Credits: 1
- NURS 756 - Advanced Pathology and Pathophysiology Credits: 4

Total: 35 credits

▲ Family Nurse Practitioner in Primary Care Concentration (FNUP)

Required Courses (23 credits)

- NURS 623 - Clinical Concepts in Community-Oriented Primary Care Credits: 3
- NURS 720 - Practicum in Family Primary Care Nursing I Credits: 4
NURS 721 - Practicum in Assessment and Management of the Developing Family Credits: 8
NURS 722 - Practicum in Family Primary Care Nursing II Credits: 8

Nurse Practitioner Support Courses (12 credits)

These required courses are colisted with George Washington University (GWU) School of Medicine and Health Sciences.

**Note:** All courses offered at GWU are charged at GWU’s tuition rates. Nurse practitioner students must have taken a continuing education health assessment course with a skills component within 18 months of taking NURS 719.

- NURS 719 - Advanced Health Assessment Credits: 2
- NURS 723 - Clinical Decision Making Credits: 2
- NURS 745 - Pharmacology Credits: 3
- NURS 747 - Pharmacology in Disease and Pathophysiology Credits: 1
- NURS 756 - Advanced Pathology and Pathophysiology Credits: 4

Total: 35 credits

▲ Advanced Clinical Nursing Concentration (NUAC)

Required Courses (26 credits)

- NURS 513 - Advanced Pharmacology in Nursing Credits: 3
- NURS 514 - Application of Advanced Health Assessment Methods Credits: 2 *
- NURS 550 - Pathophysiologic Bases for Major Health Deviations of Individuals Credits: 3
- NURS 773 - Advanced Clinical Nursing I Credits: 3
- NURS 775 - Advanced Specialty Practice I Credits: 3
- NURS 776 - Advanced Clinical Nursing II Credits: 3
- NURS 778 - Advanced Specialty Practice II Credits: 3
- Nursing Electives (6 credits)

* A continuing education health assessment course with a skills component is required within 18 months prior to taking NURS 514

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: 26-32 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)

- Nursing or related discipline electives (6 credits)
- NURS 654 - Nursing Administration Financial Management Credits: 3
  or
- HAP 703 - Financial Management in Health Systems Credits: 3

Choose one of the following management/organizational theory courses:
- HAP 621 - Management of Health Service Organizations Credits: 3
- LRNG 601 - Organizational Learning Credits: 3
- PUAD 620 - Organization Theory and Management Behavior Credits: 3

Total: 24 credits

▲ Nurse Educator Concentration (NURE)

Required Courses (15 credits)

- 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

Nurse Educator Support Courses (11 credits)
• NURS 550 - Pathophysiologic Bases for Major Health Deviations of Individuals Credits: 3
• NURS 514 - Application of Advanced Health Assessment Methods Credits: 2 *
• Nursing or related discipline electives (6 credits)

* A continuing education health assessment course with a skills component is required within 18 months prior to taking NURS 514

Total: 26 credits

▲ Clinical Nurse Leader Concentration (NUCL)

Course Work (17 credits)

• HAP 586 - Quality Improvement in Health Services Credits: 3
• NURS 654 - Nursing Administration Financial Management Credits: 3
• NURS 730 - Leadership Strategies for the Clinical Nurse Leader Credits: 2
• NURS 731 - Clinical Nurse Leader Role Integration Credits: 2
• NURS 732 - Clinical Nurse Leader Practicum Credits: 7

Clinical Nurse Leader Support Courses (8 credits)

• NURS 513 - Advanced Pharmacology in Nursing Credits: 3
• NURS 550 - Pathophysiologic Bases for Major Health Deviations of Individuals Credits: 3
• NURS 514 - Application of Advanced Health Assessment Methods Credits: 2 *
  * A continuing education health assessment course with a skills component is required within 18 months prior to taking NURS 514

Total: 25 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 license to practice nursing, be graduates of an accredited nursing program, have earned a 3.00 GPA in the 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

Note:

After completion of the bridge course, students choose one of the seven concentrations and meet all requirements of the graduate program.

Master’s International

The MSN prepares nurses for a variety of leadership roles in health care delivery systems. Courses are held on the Fairfax Campus and in distributed local health care facilities. Most classes are offered after 4 p.m., Monday through Friday. Mason is a public institution with excellent tuition rates for those who qualify for Virginia residency. Peace Corps volunteers accepted into the MSN program who are not Virginia residents may be eligible for the tuition support program to obtain the in-state rate. The program has been rated in the top 50 graduate nursing programs by U.S.News & World Report.

The Master’s International (MI), a joint program of Mason and the Peace Corps, enables participants to prepare for Peace Corps service while earning the MSN. Participants apply separately to the Peace Corps and to Mason. The MSN offers several concentrations, but two are more appropriate to the Peace Corps experience: advanced clinical nursing, a 38-credit program, and nursing administration, a 37-credit program. Students are able to complete initial requirements of 31 or 32 credits within one year (to include summer sessions). Six credits are earned as practicum credits for the overseas Peace Corps service. Students return to Mason for their final project presentation, during which they discuss and share their Peace Corps experiences with faculty and other MSN students.

Admission Requirements for MI

Applicants should hold a BSN. They must submit a completed application for graduate admission, along with the nonrefundable application fee; application for Virginia in-state rates for those claiming eligibility; original transcripts from all previously attended colleges or universities; GRE scores (cumulative undergraduate GPA may allow for waiver of the entrance exam requirement); two letters of recommendation from professional sources; résumé; and a goals statement.

Applications are reviewed throughout the year for admission to either the fall or the spring semester, although new students may take their initial course during Summer Term. Students accepted into the 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 have been accepted into the Peace Corps.

For more information about Master’s International, contact the Peace Corps regional office at 1-800-424-8580. For the Fellows/USA program, call the above number and then extension 1440.

Master's Level Certificate

Forensic Nursing Graduate Certificate

Banner Code: HH-CERG-FRNN
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).

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.

Required Courses (15 credits):

- NURS 733 - Introduction to Forensic Science Credits: 3
- NURS 734 - Role of the Sexual Assault Nurse Examiner and Interpersonal Violence Credits: 3 *
- 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

Note:

*Students who are currently certified as a SANE take GCH 602 Global Health Issues Related to Violence in place of NURS 734.

Nursing Administration Graduate Certificate

Banner Code: HH-CERG-NUAD

This program offers formal study in theory and practice in nursing administration in the health care delivery system.

Certificate Requirements

Applicants must hold a master's degree in nursing. Application is made through CHHS.

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.

Required Courses

- NURS 763 - Administrative Theory in Nursing Credits: 3
- NURS 765 - Practicum in Nursing Administration I Credits: 3
- NURS 768 - Practicum in Nursing Administration II Credits: 3

Electives
• Six graduate credits as approved by the student’s advisor

Total: 15 credits

Nursing Education Graduate Certificate

Banner Code: HH-CERG-NUED

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.

Certificate Requirements

Applicants must hold a master's degree in nursing. Application is made through CHHS.

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.

Required Courses (15 credits)

- 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

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, PhD

Banner Code: HH-PHD-NURS

The PhD in Nursing Program builds on the MSN degree and requires a minimum of 48 credit hours beyond the master's. The objective of the program is to prepare nurses for executive and educational roles in nursing and health care and to conduct research. Graduates of the program exemplify the administrative and the leadership characteristics essential to assuming executive roles; conduct and support research in nursing and health care ethics, health care administration, health policy, and nursing education; 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

In addition to fulfilling admission requirements for degree status in CHHS, 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. They must have earned a minimum GPA of 3.50 on a 4.00 scale in a master’s program. They also must show evidence of one year of experience as an RN prior to enrollment.

Other requirements are as follows:

- For international students, a TOEFL score of at least 250 (computer-based exam) or 600 (paper-based exam)
- Evidence of current licensure to practice professional nursing. Students on foreign student visas must present evidence of their country’s nursing licensure or the equivalent.
- Three letters of recommendation from professional or academic sources, with at least two of the references from people who have had contact with the applicant within the past two years
- Interview with one or more members of the doctoral admissions committee
- Writing sample describing goals in pursuing preparation for the PhD
- Evidence of prerequisite graduate-level course work in applied statistics (past two years)
- A résumé of professional experience

Students are admitted for fall semester only. All materials for admission must be submitted to the CHHS Admissions Office by March 1 of the year of application.

Students must supply official transcripts documenting satisfactory grades for graduate-level semester credits (as designated by the educational institution where taken), as well as official catalog descriptions of each course petitioned for transfer. Students may transfer up to 12 credits from other academic institutions. Transfer credits may be applied to degree requirements pending approval from the director of the program.

Other requirements are as follows:

- Successfully complete the program of study outlined in the PhD curriculum.
- Successfully complete a written doctoral candidacy comprehensive exam after completing all PhD credit requirements, except NURS 998 and 999.
- Successfully pass the final oral doctoral dissertation defense, and submit the doctoral dissertation approved by the doctoral dissertation committee, the director of doctoral program, and the CHHS dean. (The dissertation is submitted in the approved format to University Libraries and the director of the doctoral program.)
- Complete application material for graduation and the PhD degree in accordance with prevailing Mason policies

Advancement to Candidacy

After students have successfully completed the qualifying exam and all required course work, the director of the School of Nursing doctoral program approves advancement to candidacy.

Dissertation Proposal

The proposal must focus on a topic in nursing and be approved by the doctoral dissertation committee, the doctoral program director, and the CHHS dean. The dissertation proposal and written dissertation must be consistent with the guidelines outlined in Mason’s Guide for Preparing Graduate Theses, Dissertations, and Projects.

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 doctoral program director, and the CHHS dean.

**Final Oral Doctoral Exam**

The doctoral dissertation committee chair, on preliminary approval of the doctoral dissertation by the committee, petitions the doctoral program director in the School of Nursing to schedule the final oral doctoral exam, which includes a defense of the doctoral dissertation. The final oral doctoral 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 doctoral dissertation committee. At the close of the final oral doctoral exam, the committee makes a final judgment regarding approval of the doctoral dissertation and successful completion of PhD degree requirements.

**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). Before advancing to candidacy and enrolling for dissertation credit (12 credits), students must have their program of study approved by the director of the doctoral program.

▲ **Concentration in Individualized Study (INDV)**

The prerequisite for this concentration is HHS 597 Approaches to Quantitative Data Analysis in Health Care Research or the equivalent. Other prerequisites are determined individually.

**Scientific Base/Research Core (21 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 855 - Ethics in Health Administration Credits: 3
- NURS 875 - Research Internship Credits: 1-3
  Students must take 3 credit hours.
- 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

**Individualized Core (15 credits)**

- NURS 808 - Translating Nursing and Health Care Research into Evidence-Based Policy Credits: 3
- NURS 809 - Research Design and Methods in Nursing and Health Care Credits: 3
Electives (9 credits) - Students must complete a cohesive set of existing doctoral-level courses designed with their advisor and program director to contribute to their program of research. Examples may include coursework in nursing administration, biostatistics, bio-terrorism, conflict analysis, nursing education, gerontology, and cultural studies.

Dissertation (minimum 12 credits)

- NURS 998 - Doctoral Dissertation Proposal Credits: 3 (may be repeated up to four times)
- NURS 999 - Doctoral Dissertation Credits: 1-9

Total: 48 credits

Global and Community Health

Phone: 703-993-3126
web: chhs.gmu.edu/gch/

Faculty

Professors: Howell (associate dean for research and program evaluation), Butler, Metcalf, Sluzki, Gerber (chronic illness & disability center director), Whittington (associate dean for academic affairs)

Associate Professors: Baghi, Pawloski (chair), Keyser

Assistant Professors: Gewa, Jacobsen, Rudowski, Webster, Weinstein, Winter

Instructors: Freeborne, Gaston, Gillette

The Department of Global and Community Health (GCH) is an academic department within the College of Health and Human Services (CHHS), and as such it echoes the college’s overall goals. Specifically, the educational mission of GCH is to provide undergraduate and advanced degrees in health-related disciplines centered in global and community 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 community, national, and international health.

Undergraduate Degree

Community Health, BS

Banner Code: HH-BS-COMH
This degree prepares students with a basic knowledge and understanding of public health, the health care system, and issues and policies related to health promotion, disease prevention, and education. The focus is to understand health issues related to specific communities and larger populations at the national and international levels.

Public health and community health professionals work in partnership with other professionals in private and public community organizations and are expected to confront complex behavioral, cultural, and social health issues within communities. The skills and knowledge gained through this program prepare graduates to address the local, national, and global health needs of communities and 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, depending on the student’s work experience, with their advisor’s approval.

Degree Requirements

General Education (38 credits)

Written Communication:

- ENGL 101 - Composition Credits: 3
- ENGL 302 - Advanced Composition Credits: 3

Nonnative speakers of English with limited proficiency in the language may substitute ENGL 100 for ENGL 101. Students must attain a minimum grade of C in ENGL 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:
• 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 124 - Human Anatomy and Physiology Credits: 4
• BIOL 125 - Human Anatomy and Physiology Credits: 4
  Required for the Health Education, Global Health and Nutrition concentrations.

  or

• BIOL 213 - Cell Structure and Function Credits: 4
• BIOL 303 - Animal Biology Credits: 4
  Required for the Pre-Health Professions concentration.

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 295 - Nutrition for Health Professionals Credits: 3
• 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 460 - Public Health Research and Methods Credits: 3
• HAP 301 - Health Care Delivery in the United States Credits: 3
• HHS 465 - Examination and Integration of Professional and Health Care Issues Credits: 3
Choose one of the following:
• STAT 350 - Introductory Statistics II Credits: 3
• STAT 362 - Introduction to Computer Statistical Packages 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 (9 credits)

Global Health Electives (9 credits)

Three courses as approved by the department.

▲ 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
• COMM 399 - Special Topics in Communication Credits: 1-3
  Health Communications section only.
• HEAL 470 - Community Health Systems Credits: 3
• HAP 416 - Leadership and Management of Health Systems I Credits: 3
• PSYC 231 - Social Psychology Credits: 3

Health Education Electives (12 credits)

Four courses as approved by the department.
▲ 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.

- GCH 420 - Strategies for Nutrition Education Credits: 3
- GCH 421 - Community Nutrition Credits: 3
- GCH 422 - Nutrition throughout the Life Cycle Credits: 3
- GCH 423 - Nutrition and Chronic Illnesses Credits: 3
- GCH 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)

Three courses as approved by the department.

▲ Pre-Health Professions Concentration (PRHP): 29 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 211 - Developmental Psychology Credits: 3
- PSYC 325 - Abnormal Psychology Credits: 3
Choose one 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 (23-25 credits)

Total: 120 credits

Bachelor's Level Certificate
Gerontology Undergraduate Certificate

Banner Code: HH-CERB-GERO

The undergraduate certificate program in gerontology prepares students for work with older adults, as well as with professionals who are already working with the elderly. The program provides a background of basic knowledge in gerontology and prepares students in professional skill areas such as counseling, recreation, social work, nursing, and administration.

The certificate program is administered by CHHS. Three other academic units participate in the program: the College of Education and Human Development, the Department of Psychology, and the Department of Sociology and Anthropology. A Gerontology Certificate Committee determines program policy and curriculum.

Academic advising and an application form are available through CHHS.

Certificate Requirements

The certificate program consists of 24 credits. Students receiving the certificate must already hold a baccalaureate degree or have earned one from Mason by the time they receive the certificate.

Core Courses (12 credits)

Select four from the following:

- GCH 480 - Health Maintenance and Health Aspects of Aging Credits: 3
- NURS 505 - Case Management Credits: 3
- NURS 570 - Cultural Dimension of Aging Credits: 3
- PSYC 415 - Psychological Factors in Aging Credits: 3
- SOCI 441 - The Sociology of Aging Credits: 3
- SOCW 483 - Selected Approaches to Social Work Intervention Credits: 3

Gerontology Practicum (6 credits)

Students must have completed at least 9 credits of core courses before enrolling in the practicum.

- GCH 498 - Global and Community Health Internship Credits: 6

Electives (6 credits)

Select from the following:

- reading and research in gerontology from any department
- GCH 332 - Health and Disease Credits: 3
- HEAL 110 - Personal Health Credits: 3
- HEAL 323 - Program Leadership and Evaluation Credits: 3
- HEAL 480 - Special Topics Credits: 1-3
- PHED 415 - Student Teaching in Physical Education Credits: 12
PHED 450 - Physiology of Exercise Credits: 4
PHED 499 - Independent Study in Physical Education and Fitness Credits: 1-3
PRLS 210 - Introduction to Recreation and Leisure Credits: 3
PRLS 310 - Program Planning and Design Credits: 3
PSYC 211 - Developmental Psychology Credits: 3
PSYC 325 - Abnormal Psychology Credits: 3
PSYC 326 - Therapeutic Communication Skills Credits: 3
PSYC 415 - Psychological Factors in Aging Credits: 3
PSYC 423 - Group Psychotherapy Techniques Credits: 3
PUAD 502 - Administration in Public and Nonprofit Organizations Credits: 3
SOCI 350 - Community, Diversity, and Democracy: A Practicum Credits: 3
SOCI 390 - Sociology of Health, Illness, and Disability Credits: 3
SOCI 599 - Issues in Sociology Credits: 3
SOCW 200 - Introduction to Social Work Credits: 3
SOCW 351 - Social Policy and Social Justice I Credits: 3
SOCW 352 - Social Policy and Social Justice II Credits: 3

Total: 24 credits

Nutrition Undergraduate Certificate

Banner Code: HH-CERB-NUTR

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.

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. A requirement for the certificate is 24 credits of undergraduate course work.

Required Courses (21 credits)

- One sociology or anthropology course (which may include GCH 583) (3)
- One human development course such as in psychology or education (3)
- GCH 295 - Nutrition for Health Professionals Credits: 3
- GCH 420 - Strategies for Nutrition Education Credits: 3
- GCH 421 - Community Nutrition Credits: 3
- GCH 422 - Nutrition throughout the Life Cycle Credits: 3
- GCH 423 - Nutrition and Chronic Illnesses Credits: 3

General Nutrition Electives (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
- GCH 466 - Nutrition and Weight Management: Obesity, Anorexia, and Bulimia Credits: 3 *
- GCH 530 - Nutrition: A Global Perspective Credits: 3
- GCH 583 - Food and Culture: Biocultural Perspectives on Food and Nutrition Credits: 3

Note:

*GCH 466 may be substituted for either GCH 420 or 421.

Total: 24 credits

Undergraduate Minor

Nutrition Minor

Banner Code: NUTR

The minor in nutrition offers a variety of courses for students pursuing undergraduate degrees at Mason. Students who may be interested in completing the minor include those pursuing degrees related to nutrition, health, and education. The minor is intended to increase knowledge of nutrition issues. This minor is not equivalent to the registered dietitian license and does not provide a license to practice therapeutic nutrition.

Course Work

Applications are encouraged from all areas at Mason. Application is made through CHHS. 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)

- GCH 420 - Strategies for Nutrition Education Credits: 3
- GCH 421 - Community Nutrition Credits: 3
- GCH 422 - Nutrition throughout the Life Cycle Credits: 3
- GCH 423 - Nutrition and Chronic Illnesses Credits: 3
Electives (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
- GCH 466 - Nutrition and Weight Management: Obesity, Anorexia, and Bulimia Credits: 3
  
  Can be used to substitute for either GCH 420 or GCH 421.
- GCH 530 - Nutrition: A Global Perspective Credits: 3
- GCH 583 - Food and Culture: Biocultural Perspectives on Food and Nutrition Credits: 3

Total: 15 credits

Public Health Minor

Banner Code: PUBH

Public health encompasses the great variety of work done by health educators, health administrators and managers, health policymakers, community health practitioners, and health researchers. 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 courses:

- HAP 301 - Health Care Delivery in the United States Credits: 3
- GCH 405 - International Health Policy and Practice Credits: 3

Choose one from the following courses:

- GCH 310 - Health Behavior Theories Credits: 3
- GCH 350 - Health Education Credits: 3
Total: 18 credits

Master's Degree

Epidemiology and Biostatistics, MS (CHHS)

Banner Code: HH-MS-EBST

The program prepares participants to apply epidemiological and statistical principles to quantitative analysis of health care issues. It is aimed at health scientists and professionals in government agencies, such as the National Institutes of Health, pharmaceutical companies, research hospitals, public health agencies, and other medical research organizations with the need to design experiments for medical and health services research. Graduates are expected to analyze and interpret increasingly complex, non experimental health care data. The degree is taught jointly by faculty from the Department of Statistics in the Volgenau School of Information Technology and Engineering and the Department of Global and Community Health in CHHS.

Admission Requirements

Applicants must hold a baccalaureate degree in a discipline related to health science or statistics, with a GPA of 3.00 in the last 60 credits. Courses in calculus at the undergraduate level through multivariate calculus equivalent to Math 113, 114, and 213 with a grade of B or better are required for admission to the program. Applications to the degree program are made through CHHS. Admission decisions are made by a joint faculty committee from the Department of Statistics and the Department of Global and Community Health.

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 3.00 GPA to graduate.

Core Requirements (15 credits)

- GCH 712 - Introduction to Epidemiology Credits: 3
- GCH 722 - Infectious Disease Epidemiology Credits: 3
- GCH 732 - Chronic Disease Epidemiology Credits: 3
- STAT 554 - Applied Statistics Credits: 3
- STAT 660 - Biostatistical Methods Credits: 3

Epidemiology Electives (6 credits)

Select a minimum of two courses from the following:

- GCH 551 - Research Methods in Rehabilitation Science Credits: 3
- GCH 605 - Social Epidemiology Credits: 3
Statistics Electives (9 credits)

*Select a minimum of three courses from the following:

- Analysis (3)
- STAT 544 - Applied Probability Credits: 3
- STAT 574 - Survey Sampling I Credits: 3
- 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 665 - Categorical Data Analysis Credits: 3
- STAT 668 - Survival Analysis Credits: 3
- STAT 673 - 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

This degree incorporates epidemiology and biostatistics, region-based nutrition, cross-cultural perspectives in mental health issues, community health assessment, program evaluation, human resource concerns, international health systems and organizations, refugee and internally displaced people health issues, and international health research. Practicum or thesis options allow students to explore in situ 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 to 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 on 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 requires a bachelor’s degree from an accredited institution of higher education with a minimum GPA of 3.00 in the last 60 credits. Undergraduate courses in statistics, anthropology or sociology and natural sciences are helpful. In addition, at least 6 credits of a foreign language or equivalent are prerequisites for students who are not already fluent in a second language. Applications to this program are made through the CHHS.

Options

Practicum Option

For the practicum option, which entails the application of an idea or theory through fieldwork, students will be required to complete two practica of 112 hours each. Both practica must be performed within a global health agency under the guidance of a preceptor and a faculty advisor. Students are encouraged to conduct one practicum abroad and one in the Washington DC region. As part of each practicum, students must attend a seminar course, complete a project, and produce a formal report and presentation.

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 within the Department of Global and Community Health. Thesis topics must complement one of the areas of GCH faculty expertise, which include epidemiology, biostatistics, rehabilitation science, chronic illness, mental health, social networks, gerontology, nutrition, 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.

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.

Required Core Courses (27 credits)

- COMM 620 - Health Communication Credits: 3
- GCH 530 - Nutrition: A Global Perspective Credits: 3
- GCH 543 - Global Health: Trends and Policies Credits: 3
- GCH 560 - Environmental Health Credits: 3
- GCH 590 - International Health Organizations Credits: 3
- GCH 601 - Introduction to Biostatistics Credits: 3
- GCH 680 - International Research Ethics and Methods Credits: 3
- GCH 712 - Introduction to Epidemiology Credits: 3
- HAP 621 - Management of Health Service Organizations Credits: 3

Practicum or Thesis Option (6 credits)

Students may register for the practicum or thesis only with approval from their advisor and after they have completed at least 27 credits of the program.
Practicum option:
- GCH 788 - Public Health Research I Credits: 3
- GCH 789 - Public Health Research II Credits: 3

Thesis option:
- GCH 798 - Practicum in Public Health I Credits: 3
- GCH 799 - Practicum in Public Health II Credits: 3

Electives (9 credits from the following)
- ANTH 631 - Refugees in the Contemporary World Credits: 3
- COMM 506 - Communication in International Organizations Credits: 3
- COMM 656 - Global Communication Credits: 3
- EOS 704 - Spatial Analysis and Modeling of Population Credits: 3
- GEOG 540 - Medical Geography Credits: 3
- GCH 502 - U.S. Role in Global Health, Nutrition, and Population Credits: 3
- GCH 583 - Food and Culture: Biocultural Perspectives on Food and Nutrition Credits: 3
- GCH 602 - Global Health Issues Related to Violence Credits: 3
- GCH 605 - Social Epidemiology Credits: 3
- GCH 722 - Infectious Disease Epidemiology Credits: 3
- GCH 726 - Advanced Seminar in Epidemiology Credits: 3
- GOVT 641 - Seminar in Global Systems Credits: 3
- HAP 609 - Comparative International Health Systems Credits: 3
- PUAD 636 - The NGO: Policy and Management Credits: 1-3
- PUBP 757 - Public Policy in Global Health and Medical Practice Credits: 3
- PUBP 758 - Global Threats and Medical Policies Credits: 3

Total: 42 credits

Public Health, MPH

The Master of Public Health (MPH) emphasizes a skill-set tailored to expanding public health-related needs. The curriculum includes all the core disciplines of public health – epidemiology, biostatistics, health administration and policy, social and behavioral sciences, and environmental health – as well as additional courses in nutrition, global health and other cross-disciplinary topics. In addition to required coursework in each of the core disciplines and a mandatory practical experience, students will pursue a concentration in community health, epidemiology, global health, or health administration and policy. The coursework and practicum experience will prepare graduates of the program to work for agencies, businesses, and organizations that seek to improve public health at the local, national, and global level. The MPH will follow the curriculum guidelines set by the Council on Education for Public Health (CEPH), and the Department will apply for CEPH accreditation after the first group of students graduate as required by CEPH (http://www.ceph.org/).

The Master of Public Health program comprises 42 credit hours, distributed among the following categories of courses: Public Health Core (15 credits), Professional Development core (12 credits), and a concentration (15 credits). Concentrations will include community health, epidemiology, global health, and public health administration. These requirements are based on
guidelines from the Council for Education in Public Health (http://www.ceph.org/). All students will take a comprehensive master’s exam that will assess mastery of key learning objectives.

Admission Requirements

Admission to the program is competitive, and a variety of criteria are evaluated in the admission process: the strength of the undergraduate record and any post-baccalaureate course work, the GRE general examination, professional goals and experience, letters of recommendation, and evidence of the ability to write and conduct research at the graduate level. Although the GRE is required, it is only one of several areas of evaluation in the admission process. Some background in statistics, biology, and the social sciences is preferred. With the exception of international applicants, the GRE may be waived at the discretion of the department for those who hold advanced degrees.

The application deadline is April 1 for fall and November 1 for spring. Late applications will be considered on a space-available basis. Those who miss the application deadline may apply through Non-degree Studies to enroll in an MPH course, as long as they have achieved a 3.0 GPA or above in their undergraduate degree. A maximum of nine credits may be taken in non-degree status. Students in non-degree status who are latter admitted to the MPH program may petition for courses taken as non-degree to apply toward the degree.

Degree Requirements

Students must complete 42 credits of graduate course work. Each course can be used to fulfill only one requirement. 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 3.00 GPA to graduate.

Public Health Core (15 Credits)

- GCH 601 - Introduction to Biostatistics Credits: 3
  or approved statistics course.
- GCH 560 - Environmental Health Credits: 3
- GCH 610 - Foundations of Health Education and Behavior Credits: 3
- GCH 712 - Introduction to Epidemiology Credits: 3

Choose one from the following:

- GCH 590 - International Health Organizations Credits: 3
  Must be taken by those in the Global Health Concentration
- HAP 680 - Applied Public Health Leadership and Management Credits: 3
- HAP 678 - Introduction to the U.S. Health System Credits: 3

Professional Development Core (12 Credits)

- GCH 555 - Human Biology Credits: 3
Licensed health professionals may select an elective as approved.

Choose one of the following:

- HAP 680 - Applied Public Health Leadership and Management Credits: 3
- GCH 691 - Project Management in Public Health Credits: 3

Practicum or Thesis Option

Students may register for 6 credits of practicum or thesis only with approval from their advisor and after they have completed at least 27 credits of the program.

**Practicum Option**

For the practicum option, which entails the application of an idea or theory through fieldwork, students will be required to complete two practica of 112 hours each. Both practica must be performed within a public health agency under the guidance of a preceptor and a faculty advisor. As part of each practicum, students must attend a seminar course, complete a project, and produce a formal report and presentation during each practicum.

**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 within the Department of Global and Community Health. Thesis topics must be related to a subject within their chosen concentration. 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 798 - Practicum in Public Health I Credits: 3
- GCH 799 - Practicum in Public Health II Credits: 3

- GCH 788 - Public Health Research I Credits: 3
- GCH 789 - Public Health Research II Credits: 3

Complete one concentration from the following choices:

▲ **Community Health Concentration (15 Credits)**

Community health seeks to improve the health of communities. It includes private and public efforts of individuals, groups, and organizations that promote, protect, and maintain the health of populations. The community health concentration emphasizes a health education and behavior approach and prepares students to address social and behavioral factors affecting the health of communities. Through coursework and opportunities for practical application, students will learn to develop, implement, manage, and evaluate health promotion and disease prevention strategies.
Choose two of the following:

- GCH 502 - U.S. Role in Global Health, Nutrition, and Population Credits: 3
- GCH 543 - Global Health: Trends and Policies Credits: 3
- GCH 602 - Global Health Issues Related to Violence Credits: 3
- GCH 605 - Social Epidemiology Credits: 3
- COMM 620 - Health Communication Credits: 3
- COMM 705 - Intercultural Health and Risk Communication Credits: 3

Elective: 3 credits as approved by advisor

▲ Epidemiology Concentration (15 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.

- GCH 804 - Advanced Quantitative Data Analysis for Health Care Research I Credits: 3
  or approved course.

Choose three of the following:

At least one course must be GCH 722 or GCH 732.

- GCH 722 - Infectious Disease Epidemiology Credits: 3
- GCH 732 - Chronic Disease Epidemiology Credits: 3
- GCH 551 - Research Methods in Rehabilitation Science Credits: 3
- GCH 605 - Social Epidemiology Credits: 3
- GCH 680 - International Research Ethics and Methods Credits: 3
- GCH 726 - Advanced Seminar in Epidemiology Credits: 3
- GCH 752 - Nutritional Epidemiology Credits: 3

Elective: 3 credits as approved by advisor

▲ Global Health Concentration (15 Credits)

Global health is the study of health problems that extend across borders. Professionals working in global health need to be familiar with a wide range of issues, including infectious disease, nutrition, environmental health, the social and cultural factors.
that influence health and health behavior, and health policy and management. The global health concentration gives students the opportunity to develop knowledge and skills in all these areas through both coursework and practical experiences. Students completing this concentration will be prepared to design, implement, monitor, and manage global health programs.

- GCH 543 - Global Health: Trends and Policies Credits: 3
- GCH 530 - Nutrition: A Global Perspective Credits: 3

Choose two of the following:

- GCH 583 - Food and Culture: Biocultural Perspectives on Food and Nutrition Credits: 3
- GCH 594 - Special Topics in Health Care Credits: 3
  Global Health focus section only
- GCH 602 - Global Health Issues Related to Violence Credits: 3
- GCH 680 - International Research Ethics and Methods Credits: 3
- GCH 722 - Infectious Disease Epidemiology Credits: 3
- GCH 751 - Nutritional Assessment, Monitoring, and Surveillance Credits: 3
- GCH 752 - Nutritional Epidemiology Credits: 3
- HAP 609 - Comparative International Health Systems Credits: 3

Elective: 3 credits as approved by advisor

▲ Health Administration and Policy Concentration (15 Credits)

The health administration and policy concentration provides courses that explain the organization, financing, and delivery of health services and public health systems in the United States and prepare students to apply the principles of program planning, development, budgeting, management, and evaluation to organizational and community initiatives.

- HAP 660 - Health Policy Formation and Implementation Credits: 3
- HAP 715 - Health Economics Credits: 3

Choose two of the following:

- HAP 540 - Introduction to Emergency Preparedness/Disaster Recovery for Health Care Professionals Credits: 3
- HAP 609 - Comparative International Health Systems Credits: 3
- HAP 661 - Policy Development and Analysis for Community Health Programs Credits: 3
- HAP 678 - Introduction to the U.S. Health System Credits: 3
- HAP 680 - Applied Public Health Leadership and Management Credits: 3
- 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
- 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
Elective: 3 credits as approved by advisor

Total: 42 credits

Master's Level Certificate

Biostatistics Graduate Certificate (CHHS)

Banner Code: HH-CERG-BSTN

This 15 credit certificate prepares participants to apply statistical methods to quantitative analysis of health care issues. It is aimed at health scientists and professionals in government agencies, such as the National Institutes of Health. It is also aimed at and professionals in pharmaceutical companies, research hospitals, public health agencies, and other medical research organizations who design medical experiments and analyze and interpret increasingly complex health care data. In addition, the program helps prepare students to begin careers in such organizations.

The certificate is a joint graduate certificate program from the Department of Statistics in the Volgenau School of Information Technology and Engineering and the Department of Global and Community Health in CHHS. Courses are taught by faculty members from both programs.

Admission Requirements

Applicants must hold a bachelor’s degree from a regionally accredited institution of higher education in a discipline related to health science or statistics, with a GPA of 3.00 in the last 60 credits. Such fields include 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.

Certificate Requirements

Students must complete one course from each of the five groups. A minimum of 6 credits must be taken through the health science program.

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.

- GCH 712 - Introduction to Epidemiology Credits: 3
- STAT 660 - 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 three courses:
• GCH 804 - Advanced Quantitative Data Analysis for Health Care Research I Credits: 3
• STAT 656 - Regression Analysis Credits: 3
• STAT 668 - Survival Analysis Credits: 3

Choose one of the following two courses:
• NURS 805 - Advanced Quantitative Data Analysis for Health Care Research II Credits: 3
• STAT 662 - Multivariate Statistical Methods Credits: 3

Total: 15 credits

Epidemiology Graduate Certificate

Banner Code: HH-CERG-EPID

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.

Certificate Requirements

Students applying to the certificate must hold a bachelor’s degree. Application is made through the CHHS. Course work in statistics, health science, biological science, and the social sciences are beneficial in preparation for this 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.

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 Seminar in Epidemiology Credits: 3
• GCH 732 - Chronic Disease Epidemiology Credits: 3
• GCH 752 - Nutritional Epidemiology Credits: 3

Total: 18 credits
Note:

Other epidemiology-related course may count toward the certificate with prior approval of the program director.

Gerontology Graduate Certificate

Banner Code: HII-CERG-GERO

The graduate certificate program in gerontology combines theoretical and applied course work in aging with the student’s graduate curriculum in one of several departments. Because gerontology is by definition multidisciplinary, students are required to take course work outside their major field. Two other academic units participate in the program: the Department of Psychology and the Department of Sociology and Anthropology. The program is administered by CHHS and supervised by a committee with representatives from the participating academic units.

Certificate Requirements

Applicants must have a bachelor’s degree in nursing or a related discipline. Application is made through CHHS. 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 Core Courses (6 credits)

- GCH 637 - Normal Aging and Health Deviations Credits: 3
- SOCI 686 - Sociology of Aging Credits: 3

Gerontological Electives (3 credits)

Select at least one of the following:

- NURS 505 - Case Management Credits: 3
- PSYC 592 - Special Topics Credits: 3

Other Electives (3 credits)

Select at least one of the following:

- EDCD 525 - Advanced Human Growth and Development Credits: 3
- EFHP 630 - Exercise, Health, and Fitness Program Development Credits: 3
- SOCI 651 - Health Care Systems Credits: 3

Practicum Requirements (6 credits)

- GCH 770 - Gerontology Practicum I Credits: 3
- GCH 771 - Gerontology Practicum II Credits: 3
Total: 18 credits

Global Health Graduate Certificate

Banner Code: HH-CERG-GLOH

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.

Certificate Requirements

Applicants must hold a bachelor’s degree. Application is made through CHHS. 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 (12 credits)

- GCH 530 - Nutrition: A Global Perspective Credits: 3
- GCH 543 - Global Health: Trends and Policies Credits: 3
- GCH 590 - International Health Organizations Credits: 3
- GCH 798 - Practicum in Public Health I Credits: 3

Electives (select 6 credits from the following)

- GCH 550 - Introduction to 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 - Foundations of Health Education and Behavior Credits: 3
- GCH 620 - Psychosocial Aspects of Rehabilitation Credits: 3
- GCH 637 - Normal Aging and Health Deviations 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 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
- GEOG 540 - Medical Geography Credits: 3
- GEOG 581 - World Food and Population Credits: 3
- HAP 609 - Comparative International Health Systems Credits: 3
- HHS 597 - Approaches to Quantitative Data Analysis in Health Care Research Credits: 3
- PUAD 636 - The NGO: Policy and Management Credits: 1-3
Total: 18 credits

**Nutrition Graduate Certificate**

**Banner Code:** HH-CERG-NUTR

The graduate certificate in nutrition prepares students to apply the principles and 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**

Admission to this certificate requires a bachelor’s degree from an accredited institution of higher education with a minimum GPA of 3.00 in the last 60 credits. Application is made through the CHHS.

**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.

**Required Courses (12 credits)**

- GCH 530 - Nutrition: A Global Perspective Credits: 3
- GCH 566 - Nutrition and Weight Management Credits: 3
- GCH 712 - Introduction to Epidemiology Credits: 3
- GCH 751 - Nutritional Assessment, Monitoring, and Surveillance Credits: 3

**Electives (select two of the following) (6 credits)**

- GCH 583 - Food and Culture: Biocultural Perspectives on Food and Nutrition Credits: 3
- GCH 611 - Planning, Implementing, and Evaluating Health Promotion Programs Credits: 3
- GCH 752 - Nutritional Epidemiology Credits: 3
- GEOG 581 - World Food and Population Credits: 3

Total: 18 credits
Rehabilitation Science Graduate Certificate

Banner Code: HH-CERG-RHBS

The graduate certificate in rehabilitation science prepares participants 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.

Admission

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. Application is made through the CHHS.

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.

Required Courses (12 credits)

- GCH 510 - Scientific Basis for Pain, Fatigue, and Suffering in Chronic Illness and Disability Credits: 3
- GCH 550 - Introduction to Rehabilitation Science Credits: 3
- GCH 551 - Research Methods in Rehabilitation Science Credits: 3
- HHS 597 - Approaches to Quantitative Data Analysis in Health Care Research Credits: 3

Electives (3 credits)

Select one of the following:

- GCH 506 - Clinical Exercise Physiology Credits: 3
- GCH 620 - Psychosocial Aspects of Rehabilitation Credits: 3
- GCH 637 - Normal Aging and Health Deviations Credits: 3
- GCH 659 - Health Care of Aging Persons with Chronic Illnesses Credits: 3
- GCH 712 - Introduction to Epidemiology Credits: 3
- GCH 732 - Chronic Disease Epidemiology Credits: 3
- GCH 740 - Applied Physiology: Cardiorespiratory System Credits: 3

- GCH 804 - Advanced Quantitative Data Analysis for Health Care Research I Credits: 3

or
Health Administration and Policy

Phone: 703-993-1929
web: hap.gmu.edu/

Faculty

Professors: Hadley, Maddox (chair), Meiners,

Associate Professors: Eckenwiler, Moidu, Cuellar

Assistant Professors: Carle, Cartwright, Kitsantas, Perlin, Wojtusiak, Yang

Instructors: Henderson (director, outreach & education coordinator), Shiver

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, data security managers, and health policy analysts.

The research and scholarly activities of the department contribute to basic and applied knowledge about the organization and effective management, financing and performance of U.S. health systems and public health services to foster innovation and quality improvement and effective use of information technology by health services researchers, health/social system managers, and public health policy-makers. The Department works with consumers, stakeholders, students, faculty, alumni, research funders, and the community to ensure rigorous, relevant educational programs (including post-graduate professional development), service activities, and the development and timely dissemination of research.

Undergraduate Degree

Health Science, BS

Banner Code: HHH-BS-HSCI

The BS in health science prepares students to become managers and clinicians in a variety of settings, including hospitals; clinics; schools; community health, home care, long-term care, employee health, and managed care organizations; group medical practices; manufacturing, medical technology, and supply organizations; advocacy organizations and professional associations; the insurance industry; and financial consultant services. Concentrations are offered in health systems management and in assisted living administration. An accelerated pathway in health systems management is offered to students who have an associate of science degree in allied health.

The concentration in health systems management traditional and accelerated pathways prepare graduates to serve in entry-level administrative and support positions in a variety of health-related agencies and organizations.
The program may be completed on a full- or part-time basis; the accelerated pathway for graduates of allied health technical programs takes into account the needs of the adult learner. All pathways lead 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 required courses.

Students must check with their advisor to ensure that all university-wide general education 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:

- ENGL 101 - Composition Credits: 3
- ENGL 302 - Advanced Composition Credits: 3 (Business section recommended)

Nonnative speakers of English with limited proficiency in the language may substitute ENGL 100 for ENGL 101. Students must attain a minimum grade of C in ENGL 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
• BIOL 104 - Introductory Biology II 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:

Choose one of the following:

• SOCI 101 - Introductory Sociology Credits: 3
• ANTH 114 - Introduction to Cultural Anthropology Credits: 3

▲ Concentration in Health Systems Management: Traditional Pathway (HMT)

Required Courses (22 credits)

• ACCT 203 - Survey of Accounting Credits: 3
• BULE 302 - Legal Environment of Business Credits: 3
• ECON 103 - Contemporary Microeconomic Principles Credits: 3
• HHS 201 - Introduction to Careers in the Health Professions Credits: 3
• MIS 102 - Spreadsheet Applications for Business Credits: 1
• MSOM 303 - Marketing in a Global Economy Credits: 3
• PHIL 309 - Bioethics Credits: 3
• PSYC 100 - Basic Concepts in Psychology Credits: 3

Major Requirements for Pathway (33 credits)

• GCH 300 - Introduction to Public Health Credits: 3
• HAP 301 - Health Care Delivery in the United States Credits: 3
- HAP 360 - Introduction to Health Information Systems 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 442 - Introduction to Health Care Politics and Policy Credits: 3
- HAP 445 - Introduction to Health Services Research Credits: 3
- HHS 465 - Examination and Integration of Professional and Health Care Issues Credits: 3 (satisfies the university synthesis requirement)

CHHS Electives (9 credits)

- 3 credits of CHHS elective approved by the program coordinator
- HAP 498 - Health Administration Internship Credits: 6
  The internship course (HAP 498) is a 6-credit pathway elective. Students must submit an application and be chosen by a panel of HAP Department faculty. The internship is designed to provide selected students with experience in a real world work environment.

Note:

Students not choosing an internship must select alternative CHHS electives approved by the program coordinator.

General Electives (18 credits)

- Electives are at the student’s discretion.

Total: 120 credits

▲ Concentration in Health Systems Management: Accelerated Pathway for Students with an Associate’s Degree in Allied Health (HMA)

Required Courses (19 credits)

- PHIL 309 - Bioethics Credits: 3
- PSYC 100 - Basic Concepts in Psychology Credits: 3
- ECON 103 - Contemporary Microeconomic Principles Credits: 3
- MIS 102 - Spreadsheet Applications for Business Credits: 1
- ACCT 203 - Survey of Accounting Credits: 3
- MSOM 303 - Marketing in a Global Economy Credits: 3
- BULE 302 - Legal Environment of Business Credits: 3
Major Requirements for Pathway (39 credits)

- GCH 332 - Health and Disease Credits: 3
- HAP 395 - Health Care Finance Credits: 3
- HAP 396 - Strategic Health Management and Planning Credits: 3
- HAP 334 - Role Development for Health Administration Majors Credits: 3 *(bridge course)*
- HAP 360 - Introduction to Health Information Systems Credits: 3
- HAP 301 - Health Care Delivery in the United States 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 445 - Introduction to Health Services Research Credits: 3
- HHS 465 - Examination and Integration of Professional and Health Care Issues Credits: 3 *(satisfies the university synthesis requirement)*

Electives (2 credits)

The internship course (HAP 498) is a 6-credit pathway elective. Students must submit an application and be chosen by a panel of HAP department faculty. The internship is designed to provide selected students with experience in a real world work environment. Students not choosing an internship may select alternative credits through electives approved by the program coordinator.

Additional Credit Awarded (22 credits)

On completion of bridge course (HAP 334), students are awarded 22 credits from the associate’s degree program.

Total: 120 credits

▲ Concentration in Assisted Living Administration (ALA)

Required Courses (19 credits)

- PHIL 309 - Bioethics Credits: 3
- PSYC 100 - Basic Concepts in Psychology Credits: 3
- ECON 103 - Contemporary Microeconomic Principles Credits: 3
- MIS 102 - Spreadsheet Applications for Business Credits: 1
- ACCT 203 - Survey of Accounting Credits: 3
- MSOM 303 - Marketing in a Global Economy Credits: 3
- BULE 302 - Legal Environment of Business Credits: 3

Assisted Living Concentration Courses (51 credits)
• GCH 300 - Introduction to Public Health Credits: 3
• GCH 332 - Health and Disease Credits: 3
• GCH 480 - Health Maintenance and Health Aspects of Aging Credits: 3
• HAP 395 - Health Care Finance Credits: 3
• HAP 396 - Strategic Health Management and Planning Credits: 3
• HAP 307 - Assisted-Living Management and Philosophy Credits: 3
• HAP 360 - Introduction to Health Information Systems Credits: 3
• HAP 301 - Health Care Delivery in the United States 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 460 - Information Technology Project Management Credits: 3
• HHS 465 - Examination and Integration of Professional and Health Care Issues Credits: 3
• NURS 492 - Death, Dying, and Decision Making Credits: 3
• GCH 585 - Care Management of Persons with Alzheimer's Disease and Related Disorders Credits: 3 (satisfies the university synthesis requirement)
• HAP 498 - Health Administration Internship Credits: 6

Internship in assisted living and senior housing or hospitality services as approved by the program coordinator.

**Note:** This internship is designed to provide selected students with project-focused work experience in an assisted living or senior housing or hospitality enterprise under the direction of a preceptor.

**Electives (12 credits)**

• Electives must be taken from a list of electives approved by the department.

**Total: 120 credits**

**Master's Degree**

**Health Systems Management, MS**

**Banner Code:** HH-MS-HSMG

This program provides students with the skills and tools to work as leaders and executive-level managers in evolving health systems, health policy analysts, or consultants and managers of electronic commerce and technology products and enterprises in the health system. The curriculum was developed in response to the demand for advanced health management and policy preparation for a variety of health care and allied health professionals. Five concentrations are offered: executive management, health information systems, health care security and privacy, health policy analysis, 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, consultants, and health policy advisors and analysts in various settings. Graduates are prepared to work in public and private health care systems (including public health agencies); legislative arenas and policy-related professional and advocacy organizations; and health accreditation and regulatory organizations. The curriculum integrates concepts from a variety of disciplines such as business management, economics, philosophy, organizational behavior, information technology, social psychology, public policy, law, and ethics as they uniquely apply to health systems and technology management, assisted living and senior housing services administration, and health policy formulation.
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 continuum. 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 Procedures and Requirements

Health care professionals with a baccalaureate degree and at least three years of recent leadership experience in a health or related management, public policy, or technology field are eligible to apply. Applicants must submit the following: transcripts from all previous college-level studies, a letter of interest specifying study goals, a curriculum vita, and a complete Mason graduate admissions form. GRE or GMAT scores may be requested if the applicant does not have a graduate degree or has an undergraduate GPA lower than a 3.00. Applicants are competitively selected. Admitted students begin study in January and August each year. Provisional admission can be made for students whose undergraduate GPA is lower than 3.00, but whose work since school indicates a high likelihood of success in graduate work. Students admitted provisionally with lower than a 3.00 GPA must achieve a 3.00 GPA in the first 12 credits of graduate work.

Program Format and Curriculum Features

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.

Courses offer the following unique features:

- Content focuses on individual competencies in analytic decision making, and how services are provided across institutions and levels of care through integrated systems. Services are analyzed according to their effect on individual health status and enrolled populations, and how individuals and groups affect the use of health services and outcomes. Business functions are taught in the context of integrated systems versus individual institutions. For example, financial management examines how risk is incurred and distributed across multiple institutions.

- Management skills are taught from the contexts of leadership in learning organizations and as team leaders managing self-directed professionals across functional and specialized service units. Business and clinical decisions are integrated with competencies in information systems and data management for effective administrative operations in health-related organizations, clinical decision support systems, quality and safety improvement efforts (including evaluation of clinical outcomes), and inter organizational relations and operations.

- Managerial competencies are also taught relating concepts of integrated services and managed care, based on optimization of the delivery of care and services to targeted populations in the community and market. The curriculum prepares graduates to assess health risks, understand consumer behavior, and structure community networks, specialty services, and integrated health systems.

- Health policy curriculum teaches applied public policy skills that support the development and analysis of health policy and the management of political, legislative, and regulatory processes involving the financing and service delivery in the health industry and health-related technology and information management, and governing health professionals practice.

Degree Requirements
The program of study comprises 39 credits: 24 credits from the common core of the degree and another 15 from one of the six concentrations.

Note: If students have not had recent, broad, relevant experience in the U.S. health system, an additional 3-credit core course is required (HAP 678 Introduction to the U.S. Health System), bringing the number of credits required to 42.

Core Courses (24 credits)

- HAP 501 - Business Statistics in Health Service Management Credits: 3
- HAP 586 - Quality Improvement in Health Services Credits: 3
- HAP 621 - Management of Health Service Organizations Credits: 3
- HAP 715 - Health Economics Credits: 3
- HAP 740 - Management of Health Information Systems Credits: 3
- HHS 750 - Legal Issues Relevant to Health Care Administration Credits: 3
- HAP 790 - Health Management Practicum and Capstone Seminar Credits: 3
- HAP 645 - Introduction to Health Sciences Research Credits: 3

▲ Concentration in Executive Management (EMGT)

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 Policy Analysis (HP)

Required Courses (9 credits)

- HAP 642 - Health Policy Development and Analysis Credits: 3
- HAP 730 - Health Care Decision Analysis Credits: 3
- HAP 866 - Politics of Influencing Health Care Policy Credits: 3

Electives (select 6 credits from the following)

- HAP 547 - Regulatory Requirements for Health Care Systems Credits: 3
- HAP 609 - Comparative International Health Systems Credits: 3
- HAP 703 - Financial Management in Health Systems Credits: 3
- HAP 714 - Ethical Issues in Health Administration and Policy Credits: 3
• HAP 727 - Program Evaluations in Health Care Credits: 3
• HAP 745 - Health Care Security Policy 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
  others as approved by advisor

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 601 - E-Commerce and On-line Marketing for Health Services Credits: 3
• HAP 709 - Health Care Databases Credits: 3
• HAP 720 - Health Data Integration Credits: 3
• HAP 745 - Health Care Security Policy Credits: 3

Electives (3 credits)

• Approved elective (3)

Total: 15 credits
▲ Concentration in Assisted Living/Senior Housing Administration (ASHA)

Required Courses (6 credits)

- HAP 650 - Assisted Living Management and Operations Credits: 3
- HAP 705 - Strategic Management and Marketing in Health Care Credits: 3

Electives (select 9 credits from the following)

- GCH 585 - Care Management of Persons with Alzheimer's Disease and Related Disorders Credits: 3
- GCH 637 - Normal Aging and Health Deviations Credits: 3
- HAP 662 - Aging and Health Care Policy Credits: 3
- HAP 702 - Managerial Accounting in Health Care Credits: 3
- HAP 703 - Financial Management in Health Systems Credits: 3

Total: 15 credits

▲ Concentration in Risk Management and Patient Safety (RMPS)

Required Courses (12 credits)

- 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 746 - Health Policy Leadership Credits: 3
- STAT 668 - Survival Analysis Credits: 3

Elective (select 3 credits from the following)

- HAP 547 - Regulatory Requirements for Health Care Systems Credits: 3
- HAP 642 - Health Policy Development and Analysis Credits: 3
- HAP 690 - Independent Study Credits: 1-3
- HAP 720 - Health Data Integration Credits: 3
- HAP 710 - Inferential Statistics in Health Services Research and Management Credits: 3
- STAT 673 - Statistical Methods for Longitudinal Data Analysis Credits: 3
  others as approved by advisor

Total: 15 credits
Master’s International

The MS in health systems management offers high-quality academic preparation in health care management, policy analysis, health information systems, health care security and privacy, and assisted living and senior housing management. Courses are scheduled at the Fairfax Campus and are offered evenings, weekends, and online. Mason is a public institution with excellent tuition rates for those who qualify for Virginia residency. Out-of-state students accepted into both the Peace Corps and the MS program who enroll as a cohort through CHHS are eligible for a 45.5 percent reduction in tuition rates. Students benefit from the university’s proximity to Washington, D.C., by taking classes from leading professors in health policy and adjunct instructors working in government management or nonprofit settings. The Northern Virginia technology corridor provides an excellent location for students who wish to focus on management information systems.

The Master’s International (MI), a joint program of Mason and the Peace Corps, enables participants to prepare for Peace Corps volunteer service while earning the MS in health systems management. Students apply separately to the Peace Corps and to Mason. The 39-credit curriculum provides students with the skills and tools to work as leaders and executive-level managers in evolving health systems; health policy analysts; consultants and managers of electronic commerce and technology products and enterprises in the health system; and executive management of assisted living programs. An accelerated pathway is provided for Peace Corps volunteers to complete 30 credits in one year (including Summer Term). Three semester hours will be earned as internship credits for overseas Peace Corps service. Students return to Mason for their final 6 credits or take the 6 credits online.

Admission Requirements for MI Program

Applicants must submit a completed application for graduate admission along with the nonrefundable application fee; the application for Virginia in-state tuition rates for those claiming eligibility; original transcripts from all previously attended colleges or universities; résumé; and a letter of interest specifying study goals. Scores from a standardized graduate admissions test are not required but may be requested of students who do not have a graduate degree or an undergraduate GPA less than 3.00. Applications are reviewed throughout the year for admission to the fall or the spring semester, although new students may take their initial course during Summer Term. Students accepted into the 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 in the Peace Corps.

For more information, call the Peace Corps regional office at 1-800-424-8580. For the Fellows/USA Program, call the above number and then extension 1440.

Master's Level Certificate

Assisted Living/Senior Housing Administration Graduate Certificate

Banner Code: CERG-ASHA

This 15 to 18-credit certificate provides multidisciplinary education in assisted living and senior housing services management. Courses enable students to evaluate, analyze, and synthesize information relative to the aging population, the evolution of assisted living and senior housing services within the U.S. health system, the application of business practices to these services, and current regulatory and policy issues. An additional focus is on biological, psychological, and social aspects of healthy aging, and factors that promote quality of life and independence for seniors with special needs (i.e., memory issues and dementia).

Certificate Requirements
Applicants must hold a bachelor’s degree in business administration, management, or a health-related field, or they may have any bachelor's degree plus 2 year's professional experience in the health care industry. 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.

Required Courses:

- GCH 585 - Care Management of Persons with Alzheimer's Disease and Related Disorders Credits: 3
- GCH 637 - Normal Aging and Health Deviations Credits: 3
- HAP 650 - Assisted Living Management and Operations Credits: 3
- HAP 705 - Strategic Management and Marketing in Health Care Credits: 3
- HAP 790 - Health Management Practicum and Capstone Seminar Credits: 3 (optional)

* Students without recent, broad, relevant experience in the U.S. health system are required to take an additional 3-credit course:
- HAP 678 - Introduction to the U.S. Health System Credits: 3

Total: 15-18 credits

Health Care Security and Privacy Graduate Certificate

**Banner Code: HHH-CERG-HCSP**

The curriculum is expected to enhance the skills of directors responsible for information and physical security at area hospitals, nursing homes, public agencies, insurance companies, and other health care agencies. The curriculum improves the effectiveness of these directors in bringing about change within their own organization and coordinating activities with counterparts in public and private agencies.

**Admission Requirements**

Applicants must hold a bachelor’s degree. They must submit the Mason application and two letters of recommendation. Knowledge of the health care system and design of databases is not required, but students without this knowledge are required to take additional courses. Application is made through CHHS.

**Certificate Requirements**

Students are expected to have broad health care experience or complete HAP 678, and knowledge of health care databases or complete HAP 709 or INFS 601. Completion of the certificate requires 15 credits. 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.

**Required Courses**

- HAP 612 - Maintaining Business Continuity in Health Care Credits: 3
- HAP 735 - Risk Analysis in Health and Bioscience Credits: 3
- HAP 745 - Health Care Security Policy Credits: 3
- ISA 562 - Information Security Theory and Practice Credits: 3
Electives

- Select a minimum of 3 credits of advisor approved electives related to Health Care data or information systems security or policy

Total: 15 credits

Note:

Courses can be taken in any sequence. The recommended sequence is in the order of course numbers.

Health Information Systems Graduate Certificate

Banner Code: HH-CERG-HISN

This certificate prepares clinicians and health care managers to develop and manage health information systems and electronic commerce services. Students learn the development and management of systems and service related to patient records, enterprise data management in health industry, and Telehealth. The certificate is ideal for people with technical and programming skills who have been promoted to new managerial positions in the health care industry and wish to enhance their understanding of health care issues and management techniques. It is also ideal for clinicians and managers with little background in database management who wish to gain more skills and understanding about organizing health databases.

Admission Requirements

Applicants must have a bachelor’s degree. No prior computer programming training is needed, although knowledge of HTML language is assumed. Application is made through CHHS.

Certificate Requirements

Completion of the certificate requires 15-18* graduate credits. Students must complete all courses with a minimum GPA of 3.00.

Required Courses (15 credits)

- HAP 586 - Quality Improvement in Health Services Credits: 3
- HAP 601 - E-Commerce and On-line Marketing for Health Services Credits: 3
- HAP 709 - Health Care Databases Credits: 3
- HAP 720 - Health Data Integration Credits: 3
- HAP 740 - Management of Health Information Systems Credits: 3

Additional Coursework Required

If the student does not have recent, relevant experience in the U.S. health industry, an additional course is required, thus bringing the number of required credits to 18.
Quality Improvement and Outcomes Management in Health Care Systems Graduate Certificate

Banner Code: HH-CERG-QIOM

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.

Certificate Requirements

Applicants must hold a bachelor’s degree. Application is made through CHHS.

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.

Required Courses (12 credits)

- HAP 501 - Business Statistics in Health Service Management Credits: 3
  or HHS 597, or SOCW 671, or GCH 601
- HAP 586 - Quality Improvement in Health Services Credits: 3
- HAP 709 - Health Care Databases Credits: 3
- HAP 730 - Health Care Decision Analysis Credits: 3

Elective (3 credits)

Choose one course from the following:

- HAP 547 - Regulatory Requirements for Health Care Systems Credits: 3
- HAP 710 - Inferential Statistics in Health Services Research and Management Credits: 3
- HAP 715 - Health Economics Credits: 3
- HAP 740 - Management of Health Information Systems Credits: 3
- SOCW 688 - Advanced Research in Social Work Credits: 3

Note:
A course in basic computer skills (credit or noncredit) and HAP 678: Introduction to the U.S. Health System (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.

**Risk Management and Patient Safety Graduate Certificate**

**Banner Code:** HH-CERG-RMPS

This graduate certificate prepares individuals with advanced skills in health-related risk assessment, management, and safety improvement in health care organizations to gain indepth knowledge to function effectively as health care risk managers.

**Admission**

Applicants must have a bachelor’s of science degree from an accredited university, or its equivalent. Applicants must have a grade point average of 3.00 or better, submit two letters of reference, and complete an application to the certificate program. No GRE, GMAT, or other tests are necessary. Foreign students must provide a TOEFL score.

**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.

**Required Courses (12 credits)**

- HAP 730 - Health Care Decision Analysis Credits: 3
- HAP 735 - Risk Analysis in Health and Bioscience Credits: 3
- HAP 746 - Health Policy Leadership Credits: 3
- STAT 668 - Survival Analysis Credits: 3

**Elective (3 Credits)**

Choose one of the following:

- HAP 547 - Regulatory Requirements for Health Care Systems Credits: 3
- HAP 642 - Health Policy Development and Analysis Credits: 3
- HAP 690 - Independent Study Credits: 1-3
- HAP 720 - Health Data Integration Credits: 3
- HAP 710 - Inferential Statistics in Health Services Research and Management Credits: 3
- STAT 673 - Statistical Methods for Longitudinal Data Analysis Credits: 3
  other as approved by advisor

Total: 15 credits

**Social Work**
Faculty

Professors: Raskin (interim chair), Ritchie, Rose

Associate Professors: Davis, Harris Rome, Vakalahi, Wolf-Branigin

Assistant Professors: Clark, Cleaveland, Ihara, Tompkins,

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 will be provided with 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.

Undergraduate Degree

Social Work, BS

Banner Code: HH-BS-SOCW

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.

SOCW 323 has been approved as a university synthesis course and is open to all majors.

Admission Requirements

To be admitted to the social work program, a student must have completed at least 45 credits with a GPA of 2.30; completed or be registered in BIOL 103, ENGL 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, 359, 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 (53–54 credits)**

**Composition:**

- ENGL 101 - Composition Credits: 3
- ENGL 302 - Advanced Composition Credits: 3

**Oral Communication:**

- COMM 100 - Public Speaking Credits: 3

**Quantitative Reasoning:**

- MATH 106 - Quantitative Reasoning 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
- One 3 or 4 credit approved University General Education natural science course.

Western Civilization:

- 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:

- GOVT 103 - Introduction to American Government Credits: 3

Psychology:

- PSYC 100 - Basic Concepts in Psychology Credits: 3

Economics:

- ECON 100 - Economics for the Citizen 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

Social Work Major (42 credits)

- SOCW 200 - Introduction to Social Work Credits: 3
- SOCW 301 - Laboratory in Interpersonal Communication Credits: 4
- SOCW 323 - Human Behavior in the Social Environment I Credits: 3
- SOCW 324 - Human Behavior in the Social Environment II Credits: 3
- SOCW 351 - Social Policy and Social Justice I Credits: 3
- SOCW 352 - Social Policy and Social Justice II Credits: 3
- SOCW 357 - Methods of Social Work Intervention I Credits: 3
- SOCW 358 - Methods of Social Work Intervention II Credits: 3
- SOCW 359 - Junior Seminar Credits: 1
- 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 (24-25 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 social work and nonsocial work majors; it does not count toward the social work degree requirements.

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

Social Work Minor

Banner Code: SOCW

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 in the Social Environment I Credits: 3
- SOCW 351 - Social Policy and Social Justice I 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, MS (CHHS)

Banner Codes: HH-MSW-SOCW and CA-MS-CONF

The Department of Social Work is partnering with George Mason’s nationally recognized Institute for Conflict Analysis & Resolution (ICAR) 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.

**Admissions Requirements**

Students interested in the 3-year Dual Degree program, MSW and Master’s in Conflict Analysis & Resolution, must complete a University Graduate Application (one application; designate Social Work as the primary program). One Goal Statement, Three Letters of Recommendations, and Transcripts are required. In answering the Goal Statement and on Letters of Recommendations, please address your interest in both programs. For the MSW, also submit a Resume, Critical Thinking Essay, and Application Data Form. On the MSW checklist and applicant data form, check Dual Degree. Please consult the MSW program website and the Director for additional information.

**Degree Requirements**

*To graduate with the dual degree, students must successfully complete the following:*

**Social Work Courses (50 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: 4
- SOCW 685 - Organizational Leadership for Social Workers Credits: 4
- SOCW 687 - Empowering Communities for Change Credits: 4
- SOCW 688 - Advanced Research in Social Work Credits: 3
- SOCW 694 - Social Change Practicum I Credits: 4
- SOCW 695 - Social Change Practicum II Credits: 4

**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 642 - Integration of Theory and Practice Credits: 3
- CONF 694 - Internship Credits: 1-6
- CONF 713 - Reflective Practice in Interpersonal-Multiparty Conflicts Credits: 3
- CONF 795 - Professional Development Seminars Credits: 1-3

5 credits of Professional Development Seminars are required

**Electives**
Total: 85 credits

Master's Degree

Social Work, MSW

Banner Code: HH-MSW-SOCW

The MSW Program opened its doors in fall 2002 and was accredited by the Council on Social Work Education in spring 2006. The MSW Program prepares students for advanced practice in social work and has been granted full accreditation by the Council on Social Work Education. 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 working students, MSW courses are offered during late afternoon 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

Students are admitted in fall semester only. In addition to meeting the university’s graduate admission requirements, including an undergraduate degree from a regionally accredited college or university, students must have a minimum of 30 undergraduate credits in the liberal arts, including at least 3 credits in each of the following: English composition, U.S. history or government, social sciences, and statistics.

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 course in which the student earns a C may be repeated once. Overall, no more than 8 total credits of C may be repeated. A prerequisite must be satisfied with a B- or better before registering for the next course in a sequence. No more than 8 total credits of C may be repeated overall. Two course grades of F or 9 credits of unsatisfactory grades (C or below) will result in termination from the program.

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 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)

▲ Social Change Concentration (SOCC)

- SOCW 676 - Selected Topics in Social Work and Social Change Credits: 4
- SOCW 684 - Social Work and the Law Credits: 4
- SOCW 685 - Organizational Leadership for Social Workers Credits: 4
• SOCW 687 - Empowering Communities for Change Credits: 4
• SOCW 688 - Advanced Research in Social Work Credits: 3
• SOCW 694 - Social Change Practicum I Credits: 4
• SOCW 695 - Social Change Practicum II Credits: 4
• SOCW 697 - Thesis Project Seminar Credits: 3

▲ Clinical Practice Concentration (CLNP)

• SOCW 630 - Forensic Social Work Practice Credits: 4
• SOCW 640 - Advanced Clinical Practice Credits: 4
• SOCW 645 - Community-Centered Clinical Practice Credits: 4
• SOCW 674 - Psychopathology Credits: 4
• SOCW 688 - Advanced Research in Social Work Credits: 3
• SOCW 692 - Clinical Practicum I Credits: 4
• SOCW 693 - Clinical Practicum II Credits: 4
• SOCW 697 - Thesis Project Seminar Credits: 3

Thesis

• All students must successfully complete a culminating research thesis.

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.

Admission Requirements

Minimum admission requirements include a BSW degree earned within the past five years from a program accredited by the Council on Social Work Education; a GPA of 3.20 for the last 60 credits; and 30 credits of undergraduate liberal arts courses, including a minimum of 3 credits in each of the following: statistics, English composition, history or government, and social science.

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 one concentration.

Foundation Course (3 credits)
• SOCW 670 - Communication and Technology for Social Work Practice Credits: 3

Concentrations

▲ Social Change Concentration (SOCC) Courses (30 credits)

• SOCW 676 - Selected Topics in Social Work and Social Change Credits: 4
• SOCW 684 - Social Work and the Law Credits: 4
• SOCW 685 - Organizational Leadership for Social Workers Credits: 4
• SOCW 687 - Empowering Communities for Change Credits: 4
• SOCW 688 - Advanced Research in Social Work Credits: 3
• SOCW 694 - Social Change Practicum I Credits: 4
• SOCW 695 - Social Change Practicum II Credits: 4
• SOCW 697 - Thesis Project Seminar Credits: 3

▲ Clinical Practice Concentration (CLNP) Courses (30 credits)

• SOCW 630 - Forensic Social Work Practice Credits: 4
• SOCW 640 - Advanced Clinical Practice Credits: 4
• SOCW 645 - Community-Centered Clinical Practice Credits: 4
• SOCW 674 - Psychopathology Credits: 4
• SOCW 688 - Advanced Research in Social Work Credits: 3
• SOCW 692 - Clinical Practicum I Credits: 4
• SOCW 693 - Clinical Practicum II Credits: 4
• SOCW 697 - Thesis Project Seminar Credits: 3

Thesis

• All students must successfully complete a culminating research thesis.

Total: 33 credits

Note:

All other academic policies for the advanced standing program are identical to those for the regular MSW Program.
College of Humanities and Social Sciences

Phone: 703-993-8720
Web: chss.gmu.edu
College Code: LA

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- Communication
- Economics
- English
- History and Art History
- Modern and Classical Languages
- Philosophy
- Psychology
- Public and International Affairs
- Religious Studies
- Sociology and Anthropology
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- African and African American Studies
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- Honors Program in General Education
- Individualized Study (BIS)
- Interdisciplinary Minors and Certificate (CHSS)
• Interdisciplinary Studies (MAIS)
• Latin American Studies
• Russian and Eurasian Studies
• Women and Gender Studies

Administration

Jack R. Censer, Dean
Dee Ann Holisky, Senior Associate Dean
Jamie Cooper, Associate Dean for Undergraduate Academic Affairs
T. Mills Kelly, Associate Dean for Enrollment Development
Nance Lucas, Associate Dean for New Century College
Matthew Zingraff, Associate Dean for Research and Graduate Programs
Evan Baum, Assistant Dean for Undergraduate Academic Programs
Katie Clare, Assistant Dean for Undergraduate Academic Affairs
Daniel Collier, Director of Information Technology
Leslie Dyre, Director of Finance and Human Resources
Amy Lambrecht, Director of Development
Glenda Morgan, Director of Technology and Learning Initiatives

About the College

The College of Humanities and Social Sciences (CHSS) is composed of 11 departments in the humanities and social sciences and 11 major interdisciplinary programs. The college is also home to New Century College, which offers an innovative interdisciplinary major as well as a first-year experience program for students in all majors, and Technology Across the Curriculum, which promotes the use of technology to enhance learning in all courses and disciplines. The college houses the university-wide Honors Program in General Education for students from all majors. Highly qualified undergraduates can take advantage of honors programs in their majors and accelerated master’s degree programs, which enable them to earn both an undergraduate and a graduate degree in five years. The college has a distinguished faculty of more than 400, including a Nobel laureate, a MacArthur fellow, and recipients of the Pulitzer Prize and Guggenheim Fellowship.

Programs of study at the undergraduate level emphasize global awareness, research experiences, and opportunities such as internships that prepare students for the workforce. Programs of study at the graduate level provide opportunities for career development and advancement, professional education, participation in research, and personal fulfillment. All programs encourage directly or indirectly 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 below. All students are subject to the policies stated in the first chapters of this catalog. Additional policies and procedures for students in the college are presented in this chapter.

George 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 PatriotWeb 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 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.

Grievances

Grievances should be directed in writing to the senior associate dean.

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.

Policies for Undergraduate Students

The college offers 16 bachelor of arts (BA) degrees, 7 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, college level requirements, a major area of study, 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 University General Education chapter for information concerning university-wide general education 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 Institute for Conflict Analysis and Resolution (ICAR) 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 Institute for Conflict Analysis and Resolution chapter.
Questions about Academic Policies

Students with questions regarding exceptions to academic policies and college-level requirements should contact the CHSS Undergraduate Academic Affairs Office (Enterprise Hall, Suite 316; 703-993-8725; chssdean@gmu.edu).

Additional policy information and forms are available online at http://www.gmu.edu/student/academicaffairs/.

Excluded Courses and Credits

Physical Education (PHED) and Parks, Recreation, and Leisure Studies (PRLS) activity courses cannot be counted toward credits required for a degree in the College and Humanities and Social Sciences. Students may use nonactivity PHED and PRLS courses for elective credit for college degrees. For a current list of PHED and PRLS courses that may be used for credit in the college, see the CHSS Undergraduate Academic Affairs Office Web site at http://www.gmu.edu/student/academicaffairs/. Military Science (MLSC) courses cannot be counted toward credits required for a degree in the college.

Once admitted to Mason, students may not take CLEP exams and apply credits from those exams to degrees in the College of Humanities and Social Sciences. Students may apply credits from CLEP exams to degrees in the college if those credits were awarded at the time of admission.

Academic Load

The university limits undergraduate students with a cumulative GPA below 2.00 to 13 credit hours per semester. All undergraduate students returning from suspension are also limited to a maximum of 13 credit hours. Exceptions to this rule are very rare and only occur in exceptional cases.

Undergraduate students in good standing may enroll in up to 18 credit hours each semester. In exceptional circumstances, students may request an overload of the maximum credit hours. 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.

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

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.

Withdrawals

Courses for which a withdrawal is approved receive a grade of "W".

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.

Consortium of Universities Registration
Participation in consortium registration is available to degree-seeking juniors and seniors in good standing currently enrolled at Mason. Participation is limited to courses that are approved by the student's department chair and academic dean, apply to the student's program of study, are not offered during that semester at Mason, and have space available at the consortium institution. Students should consult with the Consortium Coordinator in the Registrar's Office, as additional restrictions may apply. Students may take just one course per semester, with a career maximum of two courses. 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.

Credit to Be Earned at Other Institutions

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.

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 can seldom be 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 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 http://www.gmu.edu/student/academicaffairs/.

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:

- Have a cumulative GPA of 2.25 or higher at Mason
- Have completed the immediately preceding semester at Mason with a 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.

Academic Clemency

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 exception, 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 in writing by the last day of classes for their first semester back at George Mason
• In order to make this request, students should (a) enroll in at least 6 hours during their first semester back at George Mason and (b) earn at least a 2.50 semester GPA with no grade below “C.” If these minimum academic requirements are not met during the first semester of return, then clemency will not be allowed under any circumstances.

Additional information about clemency can be found at http://www.gmu.edu/student/academicaffairs/.

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 requirements require the approval of Undergraduate Academic Affairs. When a department denies a substitution or waivers 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. Appeals of these decisions may be made to the Student Policies and Appeals Committee on the basis of procedural irregularity only, and it is the final level of approval.

Student Policies and Appeals Committee is the final level of appeal for college level requirements for CHSS; retroactive 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 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 appropriate section of the Change/Declaration of Academic Program form and submit it to the Office of the Registrar.

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)
- 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 ADJ, ANTH, ECON, GEOG (except GEOG 102 or 309), GOVT, HIST (except 100 or 125), LING, PSYC, or SOCI.
- Natural 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.
- 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. International students should consult the CHSS Undergraduate Academic Affairs Office about a possible waiver of this requirement.
- 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 the following courses:
  - ANTH 114, 300, 301, 302, 304, 305, 306, 311, 313, 330, 332, 396
  - ARTH 203, 204, 319, 320, 380, 381, 382, 383, 384, 385, 482
  - CHIN 318, 320, 325
  - DANC 118
  - ECON 361, 362
  - FREN 451
  - GEOG 101, 316, 325, 330, 399
  - GOVT 328, 332, 333, 340, 341, 345, 432, 433
  - MUSI 103
  - RELI 211, 212, 272, 313, 314, 315, 337, 374, 375, 490
  - 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.

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. CHSS students 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) with a curriculum grade point average (GPA) of at least 2.75 are considered to have met all of George Mason University’s lower level general education requirements. They are still required by the university to complete English 302 and a synthesis course. Transfer students who meet the conditions above and are pursuing a degree in CHSS 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 degree in CHSS are also 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, including a master of public administration and a master of fine arts in creative writing, and 11 doctoral degrees.

Graduate Admission

Admissions decisions are made by faculty committee and are not subject to further appeal.

If an applicant is offered graduate admission, the college reserves the right to withdraw that offer of admission if:

1. 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.
2. There has been a misrepresentation in the application process.
3. 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.

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 provisional qualifier has been removed. 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 written permission of the course instructor, director of the graduate program offering the course, and the graduate dean.

**Consortium of Universities Registration**

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. More information about the Consortium of Universities can be found in the Academic Policies chapter.

**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 grade of B or better (3.00 or higher). Courses with grades of P or S are not accepted for transfer unless the official transcript indicates that the grade is equivalent to a B (3.00) 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 Registrar’s Office 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 Criteria**

All dissertation committees must consist of at least three members of the graduate faculty, two of whom have a full-time appointment at Mason. At least one member must be a tenured or tenure-track faculty member in the College of Humanities and Social Sciences, and at least one member must be from outside the student’s academic unit. Additional members may be appointed who are not members of the graduate faculty or who are not full-time employees of the university. Individual departments and programs may set additional requirements for committee membership. The graduate program director recommends appointment of the dissertation committee to the dean. Though the dean appoints the committee it is the responsibility of the student to find qualified faculty who are willing and able to supervise the dissertation.

**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 each semester in the Schedule of Classes. 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 detailed information in the Academic Policies chapter of this catalog.
**Graduate Appeals of Dismissal or Termination**

All graduate students should be familiar with the university policies on dismissal and termination as stated in the Academic Policies chapter. 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 programs).

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 Registrar.

Students must fulfill all other master’s degree requirements. For application information, contact the individual graduate degree program.

The college offers these accelerated master's degree programs:

- Economics
- English with a concentration in linguistics
- Global Affairs
- Philosophy
- Political Science
- Psychology with a concentration in biopsychology
- Public Administration
- Sociology

**Minors**

- Administration of Justice
- African and African American Studies
- American Government
- Ancient Mediterranean Art and Archaeology
- Anthropology
- Applied Conservation Studies
- Art History
- Asia-Pacific Studies
• Chinese
• Classical Studies
• Communication
• Economic Systems Design
• Economics
• Electronic Journalism
• English
• Film and Media Studies
• Folklore and Mythology
• French
• German
• Global Affairs
• Global Systems
• History
• Immigration Studies
• International/Comparative Studies
• Islamic Studies
• Japanese Studies
• Judaic Studies
• Latin
• Latin American Studies
• Leadership
• Legal Studies
• Linguistics
• Middle East Studies
• Multimedia
• Native American and Indigenous Studies
• New Europe
• Nonprofit Studies
• Philosophy
• Philosophy and Law
• Political Philosophy
• Psychology
• Public Policy and Management
• Religious Studies
• Russian
• Science and Society
• Sociology
• Spanish
• Urban and Suburban Studies
• Women and Gender Studies

■ African and African American Studies

Phone: 703-993-1201
Web: aaas.gmu.edu/
Faculty

Brigety, Carbonneau, Carton, Cherubin, Clark, Dennis, Fauntroy, Fuchs, Haley, Horton, 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.

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 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.

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

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.
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: 3
- AFAM 499 - Independent Study Credits: 1-3
- DANC 118 - World Dance Credits: 3
- ENGL 368 - Beginnings of African American Literature Through 1865 Credits: 3
- ENGL 370 - African American Literature: Reconstruction to 1903 Credits: 3
- ENGL 371 - African American Literature Through 1946 Credits: 3
- ENGL 372 - Contemporary African American Literature Credits: 3
- FREN 451 - Sub-Saharan African Literature Credits: 3
- FREN 454 - Caribbean Literature in French Credits: 3
- GEOG 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 Civilization Credits: 3
- HIST 262 - Survey of African Civilization 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 340 - History of American Racial Thought Credits: 3
- HIST 466 - Origins of Conflict in Southern Africa Credits: 3
- SOCI 308 - Racial and Ethnic Relations Credits: 3
- SOCI 332 - Sociology of Urban Communities Credits: 3

Total: 15 credits

■ Administration of Justice

Phone: 703-993-8315
Web: adj.gmu.edu
Faculty

Professors: Mastrofski, Taxman, Weisburd, Zingraff

Research professors: Turner, Waddington

Associate professors: Gallagher, Gould, Wilson (chair)

Assistant professors: Johnson, Lawton, Lum, Merola, Portillo, Rudes, Willis

Assistant research professors: Trotman, Andrew

Term instructors: Newmark, Sizemore, Wheeldon

Affiliate faculty: Uchida

Course Work

The Administration of Justice Department offers all course work designated ADJ and JLCP in the Courses chapter of this catalog.

Undergraduate Programs

The BS in administration of justice provides students with a sound foundation in the liberal arts and a focused study of the justice system as well as the social, human, and moral problems raised in the administration of justice. 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.

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 ADJ 491 and 492. To graduate with honors in ADJ, 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 master's and doctoral degrees in justice, law, and crime policy. Both degree programs draw on a strong multidisciplinary faculty, who teach a wide range of courses in their specialties to support the graduate programs. These programs can also take advantage of Mason's proximity to 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 as well as to be able to work with local and national justice and security agencies to put those skills to use.

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

Administration of Justice, BS

Banner Code: LA-BS-ADJ

This bachelor of science in administration of justice 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 administration of justice. 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 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 Administration of Justice.

For policies governing all undergraduate degrees, see the Academic Policies chapter of the catalog.

Degree Requirements

In addition to satisfying university general education requirements and the requirements for a bachelor of science degree in the College of Humanities and Social Sciences, students pursuing this degree must complete 67 credits with a minimum GPA of 2.00.

Five core courses (16 credits):

- ADJ 100 - Introduction to Criminal Justice Credits: 3
- ADJ 300 - Research Methods and Analysis Credits: 4
- ADJ 303 - Experiencing the Criminal Justice System Credits: 3
- ADJ 306 - Criminal Justice Ethics Credits: 3
- ADJ 424 - Constitutional Law: Criminal Process and Rights Credits: 3

Twelve elective courses (36 credits) including at least 24 credits of ADJ courses chosen from:

- ADJ 301 - Public Law and the Judicial Process Credits: 3
  or
- GOVT 301 - Public Law and the Judicial Process Credits: 3

- ADJ 302 - Delinquency Credits: 3
- ADJ 304 - Computer Crime, Forensics, and Auditing Credits: 3
• ADJ 305 - Crime and Crime Policy Credits: 3
• ADJ 307 - Social Inequality, Crime, and Justice Credits: 3
• ADJ 308 - Human Rights and Justice Credits: 3
• ADJ 400 - Applied Criminal Psychology Credits: 3
• ADJ 401 - Policing in America Credits: 3
• ADJ 402 - Punishment and Corrections Credits: 3
• ADJ 403 - Community Corrections Credits: 3
• ADJ 404 - Crime Victims and Victimization Credits: 3
• ADJ 405 - Law and Justice around the World Credits: 3
• ADJ 406 - Family Law and the Justice System Credits: 3
• ADJ 407 - Law and Society Credits: 3
• ADJ 408 - Criminal Courts Credits: 3
• ADJ 409 - Community Policing Credits: 3
• ADJ 422 - Controversial Legal Issues Credits: 3

• ADJ 423 - Constitutional Law: Civil Rights and Liberties Credits: 3
• GOVT 423 - Constitutional Law: Civil Rights and Liberties Credits: 3

• ADJ 425 - Criminal Justice Management Credits: 3
• ADJ 460 - Surveillance and Privacy in Contemporary Society Credits: 3
• ADJ 461 - Introduction to Homeland Security Credits: 3
• ADJ 462 - Law Enforcement and Homeland Security Credits: 3
• ADJ 471 - Prevention and Deterrence of Crime Credits: 3
• ADJ 475 - Theory and Politics of Terrorism Credits: 3
• ADJ 490 - Special Topics in Administration of Justice Credits: 1-3
• ADJ 491 - Honors Seminar I Credits: 3
• ADJ 492 - Honors Seminar II Credits: 3
• ADJ 499 - Independent Study in Administration of Justice Credits: 1-3
• GOVT 101 - Democratic Theory and Practice Credits: 3
• GOVT 103 - Introduction to American Government Credits: 3
• GOVT 420 - American Political Thought Credits: 3
• GOVT 421 - Contemporary Political Ideologies Credits: 3
• GOVT 452 - Administrative Law and Procedures Credits: 3
• PHIL 151 - Introduction to Ethics Credits: 3
• PHIL 311 - Philosophy of Law Credits: 3
• PSYC 100 - Basic Concepts in Psychology Credits: 3
• PSYC 211 - Developmental Psychology Credits: 3
• PSYC 231 - Social Psychology Credits: 3
• PSYC 314 - Adolescent Psychology Credits: 3
• PSYC 325 - Abnormal Psychology Credits: 3
• PSYC 326 - Therapeutic Communication Skills Credits: 3
• SOCI 101 - Introductory Sociology Credits: 3
• SOCI 301 - Criminology Credits: 3
• SOCI 308 - Racial and Ethnic Relations Credits: 3
• SOCI 310 - Sociology of Deviance Credits: 3
• SOCI 315 - Sex and Gender in Contemporary Society Credits: 3
• SOCI 352 - Social Problems Credits: 3
• SOCI 475 - Women and the Law 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 423 - Social Work with Children and Adolescents Credits: 3
• SOCW 430 - Social Work and the Law Credits: 3
• CONF 300 - Conflict Resolution Techniques and Practice Credits: 3
• CONF 302 - Identity Conflicts and their Resolution Credits: 3
• CONF 320 - Interpersonal Conflict Analysis and Resolution Credits: 3
• CONF 330 - Community, Group, and Organizational Conflict Analysis and Resolution Credits: 3
• CONF 393 - Philosophy, Conflict Theory, and Violence Credits: 3

15 credits in skills for the justice professional chosen from:

• Any foreign language courses that develop or require foreign language skills and are taught in the language
• Any CS course; any IT course
• ADJ 479 - Preparation for Internship Credits: 3
• ADJ 480 - Internship in Justice Administration Credits: 3-12
• GEOG 311 - Introduction to Geographic Information Systems Credits: 3
• GOVT 305 - Contemporary American Federalism Credits: 3
• GOVT 309 - Government and Politics of Metropolitan Areas Credits: 3
• GOVT 351 - Administration in the Political System 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 359 - Computers in Public Management Credits: 3
• GOVT 364 - Public Policy Making Credits: 3
• GOVT 366 - Public Policy Analysis Credits: 3
• GOVT 400 - Political Research and Data Analysis Credits: 3
• GOVT 464 - Issues in Public Policy and Administration Credits: 1-3
• PSYC 260 - Basic Research Methods in Psychology Credits: 1-3
• SOCI 405 - Analysis of Social Data Credits: 4
• SOCI 410 - Social Surveys and Attitude and Opinion Measurements 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
• SOCW 200 - Introduction to Social Work Credits: 3
• SOCW 301 - Laboratory in Interpersonal Communication Credits: 4
• SOCW 323 - Human Behavior in the Social Environment I Credits: 3
• SOCW 324 - Human Behavior in the Social Environment II Credits: 3
• SOCW 351 - Social Policy and Social Justice I Credits: 3
• SOCW 352 - Social Policy and Social Justice II Credits: 3
• SOCW 425 - Planning and Organizing for Community Change Credits: 3
• SOCW 430 - Social Work and the Law Credits: 3
Concentrations

ADJ majors have the option of obtaining a concentration by completing 15 of their 36 elective credits within one of the following areas. Credits earned in ADJ 490, 491, 492, and 499, when relevant, may be applied to a concentration with prior written approval of the director of the BS in Administration of Justice Program.

▲ Concentration in Law and Society (LAWS)

- ADJ 301 - Public Law and the Judicial Process Credits: 3
- ADJ 308 - Human Rights and Justice Credits: 3
- ADJ 405 - Law and Justice around the World Credits: 3
- ADJ 406 - Family Law and the Justice System Credits: 3
- ADJ 407 - Law and Society Credits: 3
- ADJ 408 - Criminal Courts Credits: 3
- ADJ 422 - Controversial Legal Issues Credits: 3
- ADJ 423 - Constitutional Law: Civil Rights and Liberties Credits: 3
- ADJ 460 - Surveillance and Privacy in Contemporary Society Credits: 3
- GOVT 452 - Administrative Law and Procedures Credits: 3

▲ Concentration in Criminal Justice (CJUS)

- ADJ 302 - Delinquency Credits: 3
- ADJ 304 - Computer Crime, Forensics, and Auditing Credits: 3
- ADJ 305 - Crime and Crime Policy Credits: 3
- ADJ 307 - Social Inequality, Crime, and Justice Credits: 3
- ADJ 400 - Applied Criminal Psychology Credits: 3
- ADJ 401 - Policing in America Credits: 3
- ADJ 402 - Punishment and Corrections Credits: 3
- ADJ 403 - Community Corrections Credits: 3
- ADJ 404 - Crime Victims and Victimization Credits: 3
- ADJ 408 - Criminal Courts Credits: 3
- ADJ 409 - Community Policing Credits: 3
- ADJ 425 - Criminal Justice Management Credits: 3
- ADJ 471 - Prevention and Deterrence of Crime Credits: 3

▲ Concentration in Homeland Security and Justice (HSJ)

- ADJ 405 - Law and Justice around the World Credits: 3
- ADJ 460 - Surveillance and Privacy in Contemporary Society Credits: 3
- ADJ 461 - Introduction to Homeland Security Credits: 3
- ADJ 462 - Law Enforcement and Homeland Security Credits: 3
- ADJ 475 - Theory and Politics of Terrorism Credits: 3
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 administration of justice fulfill this requirement by successfully completing ADJ 303. Students should complete ENGL 302 before taking the writing-intensive course in the major or take the two courses simultaneously.

Undergraduate Minor

Administration of Justice Minor

Banner Code: ADJ

This minor develops knowledge of the principles, institutions, and practices for systems of administering justice. It provides a solid foundation for students seeking to supplement their major area of study, develop knowledge and skills needed for justice-related occupations, or lay the foundation for possible graduate study in the justice field. Students first obtain an overview of the justice system, learn legal or ethical standards by which to judge the behavior of justice practitioners, and then develop advanced knowledge of selected features of the justice system.

Students should plan their course of study with an Administration of Justice faculty advisor who will be assigned by the program. The minor must be approved by the Administration of Justice Program before graduation.

This program of study is offered by the Department of Administration of Justice.

For policies governing all minors, see the Academic Policies chapter of this catalog.

Course Work

Students pursuing this minor must complete 15 credits distributed as follows.

One required course (3 credits):

- ADJ 100 - Introduction to Criminal Justice Credits: 3

Four courses (12 credits) in upper-level ADJ courses

- ADJ 479 and ADJ 480 may not be used to fulfill this requirement.

Master's Degree

Justice, Law, and Crime Policy, MA

Banner Code: LA-MA-JLCP
The Justice, Law and Crime Policy (JCLP) MA Program 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 Masters program aims to train individuals seeking to enhance analytical and policy evaluation skills to further career development or prepare for competitive, sought-after positions.

The program draws from a multidisciplinary faculty in the Administration of Justice Program for required core courses and electives. It also makes available a wide range of other electives from many 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 Administration of Justice.

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 resulting in a degree in a relevant area, subject to approval by the graduate director and dean and in accordance with university policies.

**Satisfactory Progress**

Each new student is assigned a faculty advisor who helps develop a program of study. The advisor and JCLP 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 JCLP Program is defined as maintaining a GPA of at least a 3.00 and all course work must result in grades of B- or above. An academic warning will be issued at the first grade below B-, and dismissal will be initiated at the second grade below B-.

**Application Requirements**

See the Application for Graduate Study for admissions deadlines for the Spring and Fall semesters. Late applications will be considered on a space available basis. There is no required background or preferred experience, but students should demonstrate interest in and aptitude for graduate study in justice, law, and crime policy. In addition to meeting all requirements for graduate study, applicants should submit three letters of recommendation from faculty members or individuals with first-hand knowledge of academic or professional capabilities; a statement of purpose of study no longer than 500 words; official verbal, quantitative, and analytical GRE scores on tests taken within five years of application submission; and a writing sample of a recent sole-authored work of at least 2,500 words. An interview may be required.

**Degree Requirements**

Four core courses (12 credits) in three fields:

**Justice and Law:**
• JLCP 700 - Theories of Justice Credits: 3
• JLCP 720 - Behavior of Law Credits: 3

Justice organizations, administration, and leadership:

• JLCP 740 - Justice Organization and Administration Credits: 3

Crime and crime policy:

• JLCP 760 - Crime and Crime Policy Credits: 3

Three courses (9 credits) of analytic methods:

• JLCP 780 - Research Methods Credits: 3
• JLCP 782 - Statistics I Credits: 3
• JLCP 783 - Statistics II Credits: 3

Thesis (3 to 6 credits):

• JLCP 799 - Master's Thesis Credits: 1-6

Note:

A maximum of 6 credits of thesis may be applied to the degree. A thesis proposal form must be submitted to the graduate program director prior to enrollment in thesis credits. The master’s thesis must be defended orally before a committee of three faculty appointed by the JLCP graduate director.

One to two elective courses (3 to 6 credits):

• Chosen from courses in one or more substantive fields of study listed below

Substantive Fields of Study

Master’s students are required to take one or two of the offered electives within the substantive fields of study (depending upon how many thesis credits are taken). Master’s students may take one non-JLCP elective course. Students may use other courses offered by JLCP or other programs as elective credit for a substantive field with prior written approval of the student’s advisor, director of the JLCP program, and sponsoring program.

Justice and Law

Justice-related electives:
• JLCP 702 - Comparative Justice Credits: 3
• JLCP 703 - Restorative Justice Credits: 3
• GOVT 520 - Political Theory Credits: 3
• GOVT 725 - Democratic Theory and Democratization Credits: 3
• GOVT 631 - Seminar in Comparative Politics and Institutions Credits: 3
• SOCI 611 - Classical Sociological Theory Credits: 3
• SOCI 612 - Contemporary Sociological Theory Credits: 3
• SOCI 619 - Conflict and Conflict Management: Perspectives from Sociology Credits: 3
• SOCI 640 - Social Theory and Social Policy 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
• 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*
• JLCP 721 - The Constitution, Criminal Procedure, and Security Credits: 3
• JLCP 722 - Civil Justice Credits: 3
• JLCP 723 - Law and Social Control Credits: 3
• JLCP 730 - Seminar in the Courts and Constitutional Law 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: 3
• ECON 895 - Special Topics in Economics Credits: 3

Note:

*Successful completion of JLCP 720 and 721 is a prerequisite for enrollment in LAW courses, which also requires preapproval from the JLCP coordinator, law school instructor, and associate dean for student academic affairs of the Law School.

Justice Organizations, Administration, and Leadership

• JLCP 741 - Conduct of Justice Organizations at the Street Level Credits: 3
• JLCP 742 - Leadership in Justice and Security Organizations Credits: 3
• JLCP 743 - Changing Justice and Security Organizations Credits: 3
• JLCP 749 - Issues in Justice Administration Credits: 1-3
- JLCP 509 - Justice Organizations and Processes Credits: 3
- JLCP 510 - Policing in a Democratic Society Credits: 3
- JLCP 691 - Justice Program Planning and Implementation Credits: 3
- PUAD 502 - Administration in Public and Nonprofit Organizations Credits: 3
- PUAD 620 - Organization Theory and Management Behavior Credits: 3
- PUAD 621 - Principles and Practices in Government Organization and Management Credits: 3
- PUAD 622 - Program Planning and Implementation Credits: 3
- PUAD 640 - Public Policy Process 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 532 - The Social Psychology of Industry Credits: 3
- PSYC 631 - Industrial and Personnel Testing and Evaluation Credits: 3
- PSYC 639 - Survey of Organizational Processes Credits: 3
- SOCI 505 - Sociology of Sex and Gender Credits: 3
- SOCI 523 - Racial and Ethnic Relations: American and Selected Global Perspectives Credits: 3
- SOCI 692 - McDonaldization of Organizations Credits: 3

**Crime and Crime Policy**

- JLCP 761 - Politics of Crime Policy Credits: 3
- SOCI 607 - Criminology Credits: 3
- GOVT 745 - International Security Credits: 3
- PUAD 640 - Public Policy Process Credits: 3
- PUAD 644 - Public Policy Models Credits: 3
- PUAD 741 - Policy Analysis Credits: 3
- PSYC 617 - Child Psychopathology Credits: 3

**Note:**

Students may use other courses offered by JLCP or other programs as elective credit for a substantive field with prior written approval of the student’s advisor, director of the JLCP program, and sponsoring program.

**Doctoral Degree**

**Justice, Law, and Crime Policy, PhD**

*Banner Code: LA-PHD-JLCP*
The Justice, Law and Crime Policy (JCLP) PhD program 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 from a multidisciplinary faculty in the Administration of Justice Program for required core courses and electives. It also makes available a wide range of other electives from many 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 Administration of Justice.

For policies governing all graduate degrees, see the Academic Policies chapter of the catalog.

Reduction of Credit

Students entering the doctoral program with a master’s degree in a related discipline, including law degrees, may request that the required credits for the doctoral degree be reduced by a maximum of 24 credits with approval of the program 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 JLCP degree program, with approval of the program coordinator 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 advancing to candidacy, the chair of the dissertation committee becomes the advisor. The advisor and JLCP 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 JLCP program is defined as maintaining a GPA of at least a 3.00 and all course work must result in grades of B- or above. An academic warning will be issued at the first grade below B-, and dismissal will be initiated at the second grade below B-.

Application Requirements

See the Application for Graduate Study for admissions deadlines for the Spring and Fall semesters. Late applications will be considered on a space-available basis. Applicants admitted to the JLCP doctoral program without a graduate degree in a relevant area will be required to complete the JLCP master’s degree as an integral part of the doctorate. There is no required background or preferred experience, but students should demonstrate interest in and aptitude for graduate study in justice, law, and crime policy.

In addition to meeting all requirements for graduate study, applicants should submit three letters of recommendation from faculty members or individuals who have first-hand knowledge of the applicant’s academic or professional capabilities; a statement of purpose of study no longer than 500 words; official verbal, quantitative, and analytical GRE scores on tests taken within five years of application submission; and a writing sample of a recent sole-authored work of at least 2,500 words. An interview may be required.

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 requirements are the dissertation proposal defense and 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):

- JLCP 700 - Theories of Justice Credits: 3
- JLCP 720 - Behavior of Law Credits: 3
- JLCP 740 - Justice Organization and Administration Credits: 3
- JLCP 760 - Crime and Crime Policy Credits: 3

Four analytical methods courses (12 credits):

- JLCP 780 - Research Methods Credits: 3
- JLCP 782 - Statistics I Credits: 3
- JLCP 783 - Statistics II Credits: 3

and one course chosen from:

- JLCP 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 673 - Statistical Methods for Longitudinal 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
- PUAD 643 - Public Policy Research Credits: 3
- CSS 600 - Introduction to Computational Social Science Credits: 3
- CSS 610 - Computational Analysis of Social Complexity Credits: 3

Six courses (18 credits) in two substantive fields of study:

- Select two substantive fields and complete three courses within each area. Students may take one non-JLCP elective course in each area or other courses offered by JLCP with prior written approval of the director of the JLCP program.

Justice and Law
Justice-related electives:

- JLCP 702 - Comparative Justice Credits: 3
- JLCP 703 - Restorative Justice Credits: 3
- GOVT 520 - Political Theory Credits: 3
- GOVT 725 - Democratic Theory and Democratization Credits: 3
- GOVT 631 - Seminar in Comparative Politics and Institutions Credits: 3
- SOCI 611 - Classical Sociological Theory Credits: 3
- SOCI 612 - Contemporary Sociological Theory Credits: 3
- SOCI 619 - Conflict and Conflict Management: Perspectives from Sociology Credits: 3
- SOCI 640 - Social Theory and Social Policy 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
- 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*
- JLCP 721 - The Constitution, Criminal Procedure, and Security Credits: 3
- JLCP 722 - Civil Justice Credits: 3
- JLCP 723 - Law and Social Control Credits: 3
- JLCP 730 - Seminar in the Courts and Constitutional Law 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: 3
- ECON 895 - Special Topics in Economics Credits: 3

Note:

*Successful completion of JLCP 720 and 721 is a prerequisite for enrollment in LAW courses, which also requires preapproval from the JLCP coordinator, law school instructor, and associate dean for student academic affairs of the Law School.

Justice Organizations, Administration, and Leadership

- JLCP 741 - Conduct of Justice Organizations at the Street Level Credits: 3
- JLCP 742 - Leadership in Justice and Security Organizations Credits: 3
• JLCP 743 - Changing Justice and Security Organizations Credits: 3
• JLCP 749 - Issues in Justice Administration Credits: 1-3
• JLCP 509 - Justice Organizations and Processes Credits: 3
• JLCP 510 - Policing in a Democratic Society Credits: 3
• JLCP 691 - Justice Program Planning and Implementation Credits: 3
• PUAD 502 - Administration in Public and Nonprofit Organizations Credits: 3
• PUAD 620 - Organization Theory and Management Behavior Credits: 3
• PUAD 621 - Principles and Practices in Government Organization and Management Credits: 3
• PUAD 622 - Program Planning and Implementation Credits: 3
• PUAD 640 - Public Policy Process 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 532 - The Social Psychology of Industry Credits: 3
• PSYC 631 - Industrial and Personnel Testing and Evaluation Credits: 3
• PSYC 639 - Survey of Organizational Processes Credits: 3
• SOCI 505 - Sociology of Sex and Gender Credits: 3
• SOCI 523 - Racial and Ethnic Relations: American and Selected Global Perspectives Credits: 3
• SOCI 692 - McDonaldization of Organizations Credits: 3

Crime and Crime Policy

• JLCP 761 - Politics of Crime Policy Credits: 3
• SOCI 607 - Criminology Credits: 3
• GOVT 745 - International Security Credits: 3
• PUAD 640 - Public Policy Process Credits: 3
• PUAD 644 - Public Policy Models Credits: 3
• PUAD 741 - Policy Analysis Credits: 3
• PSYC 617 - Child Psychopathology Credits: 3

At least one elective course (at least 3 credits) relevant to JLCP

Dissertation proposal (3 to 6 credits):

• JLCP 998 - Doctoral Dissertation Proposal Credits: 1-6

Dissertation (12 to 21 credits):
Qualifying Exams

Students must pass written qualifying exams in two core substantive fields of the student’s choosing, selected from the three fields below. Students may take a single qualifying exam at each sitting. All three qualifying exams will be offered 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.

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.

Continuous Registration

Once enrolled in 998, a student must maintain continuous registration in 998 or 999 each semester until the dissertation is submitted to and accepted by the University Library.

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 JLCP faculty and one, a member of the graduate faculty outside JLCP. The chair must be a full-time JLCP faculty member.

Communication

Phone: 703-993-1090  
Web: comm.gmu.edu

Faculty

Professors: Boileau, Botan, Decker, Friedley, Kreps (chair), Lichter, Lont, Maibach, McAuley, Rowan (associate chair)

Emeritus professors: Looney, Manchester, Taylor

Associate professors: Gibson, Muir, Nicotera, Villagran

Assistant professors: Cai, Farnsworth, Hopson, Zhao

Term full professor: Pober

Term associate professor: Finn

Term assistant professors: Bedore, Wright
**Term research assistant professor:** Roser-Renouf

**Term instructors:** Anderson, M. Dickerson, Haynes, Klein, R. Smith, Talkington, Tomasovic, Warren

**Term research instructor:** McCutcheon

**Adjuncts:** Ahmad, Akyeampong, Atwell, Aw, Barber, Beck, Biedrycki, Chaaban, Chilcote, Clark, Cordero, Dance, Dickerhoof, N. Dickerson, Dillon, Doyle, Effros, Feigenbaum, Fisher, Garifo, Gauthier, Gladis, Greiner, Hadj, Hansche, Harzold, Holsonbake, Kahn, Kehoe, Kohlmann, Kraus, Kubiske, Ledford, Lehman, LeValley, Long, Mangus, Mattox, Moss, Outlaw, Payne, Peck, Plaag, Schmeidler, Simpson, Slagle, Stumpo, Suarez, Trowbridge, Van Zummeren, Walsch, Walter, Wilson, Wolyn, R. Wood

**Affiliate:** J. R. Censer (professor)

## 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 in from one of these areas: interpersonal and organizational communication, journalism, media production and criticism, persuasive and political communication, and 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 who have completed 80 credits with an overall minimum GPA of 3.50 and a minimum GPA of 3.50 in communication courses are eligible to apply. They must have satisfactorily completed or be enrolled in COMM 200, 300, 301, 302, 305, and 400. Eligible students are invited to submit a proposal for an honors thesis, and, if the proposal is approved, they are admitted to the program. To receive honors in the major, students must complete specific course work with a minimum GPA of 3.5 and write an acceptable honors thesis. For more information, contact the director of honors in communication.

### 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, 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 master's and a doctoral degree in communication with two major areas of emphasis: strategic communication and health 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 public relations theory and research, teach courses on planning, developing, executing, and evaluating public communication campaigns. Faculty in health communication teach courses which explore the relationship between communication practices and the health and well-being of individuals and communities. This ranges from how to improve cooperation and coordination between health care providers and patients to how to develop more effective health promotion campaigns.

Strategic communication and health communication are two of the most rapidly expanding specialties within the broad field of communication. Graduates of these programs find a very welcoming employment market for 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**

*Banner Code: LA-BA-COM*

The bachelor of arts degree 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**

In addition to satisfying university general education requirements and the requirements for a bachelor of arts 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.
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, 302, 305, or 400.

- COMM 200 - Introduction to Communication 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)

Presentation-Intensive Requirement

Students must complete a presentation-intensive course chosen from the following courses (or COMM 399 when the topic is special occasion speaking). The presentation-intensive course may simultaneously fulfill the requirements for elective courses in communication or an approved concentration.

- 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

Approved concentration (12 credits):

Students must declare a 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, when relevant, may be applied toward a concentration with prior written approval of the undergraduate director.

▲ Concentration in Interpersonal and Organizational Communication (IOC)

Four courses (12 credits) chosen from:

- COMM 201 - Small Group Communication Credits: 3
- COMM 230 - Case Studies in Persuasion Credits: 3
- COMM 320 - Business and Professional Communication Credits: 3
- COMM 332 - Nonverbal Communication Credits: 3
- COMM 335 - Organizational Communication Credits: 3
- COMM 344 - Parliamentary Procedure Credits: 1
- COMM 401 - Interpersonal Communication in the Workplace Credits: 3
- COMM 430 - Persuasion Credits: 3
- COMM 434 - Interviewing Credits: 3
• COMM 465 - Topics in Communication and Gender Credits: 3

▲ Concentration in Journalism (JNL)

Three courses (9 credits) chosen from:

• COMM 145 - Newspaper Workshop I Credits: 1
• COMM 203 - Introduction to Journalism Credits: 3
• COMM 210 - Voice and Articulation 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
• COMM 352 - News Editing: Print and Beyond Credits: 3
• COMM 353 - Broadcast Journalism Credits: 3
• COMM 356 - Video: Performance and Writing Credits: 3
• COMM 361 - Online Journalism Credits: 3
• COMM 362 - Argument and Public Policy Credits: 3
• COMM 370 - Feature Writing Credits: 3
• COMM 371 - Sports Writing and Reporting Credits: 3
• COMM 374 - Political Journalism Credits: 3
• COMM 390 - Case Studies in Public Relations Credits: 3
• COMM 391 - Writing for Public Relations Credits: 3
• COMM 412 - Politics and the Mass Media Credits: 3
• COMM 431 - Information Technology and the Political Process Credits: 3
• COMM 434 - Interviewing Credits: 3
• COMM 435 - Computers and Communication Credits: 3
• COMM 454 - Free Speech and Ethics Credits: 3
• COMM 455 - History of Print Journalism Credits: 3
• COMM 475 - Journalism Law Credits: 3

One required course (3 credits):

• COMM 303 - Writing across the Media Credits: 3

▲ Concentration in Media Production and Criticism (MPC)

Four courses (12 credits) chosen from:

• COMM 148 - Radio Workshop I Credits: 1
• COMM 157 - Video Workshop Credits: 1
• COMM 202 - Mass Media and Communication Systems Credits: 3
• COMM 210 - Voice and Articulation 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 360 - Video Editing Credits: 3
• COMM 363 - Media Career Seminar Credits: 1
• COMM 365 - Women and Media Credits: 3
• COMM 366 - Visual Communication Credits: 3
• COMM 375 - Mass Communication Advertising and Promotions Credits: 3
• COMM 380 - Media Criticism Credits: 3
• COMM 456 - Comparative Mass Media Credits: 3

▲ Concentration in Persuasive and Political Communication (PPC)

Four courses (12 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 430 - Persuasion Credits: 3
• COMM 431 - Information Technology and the Political Process Credits: 3
• COMM 432 - Political Communication Credits: 3
• COMM 454 - Free Speech and Ethics Credits: 3
• COMM 465 - Topics in Communication and Gender Credits: 3

▲ Concentration in Public Relations (PR)

Four courses (12 credits) chosen from:

• COMM 202 - Mass Media and Communication Systems 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 330 - Principles of Public Relations 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 - Case Studies in Public Relations Credits: 3
• COMM 391 - Writing for Public Relations Credits: 3
• COMM 430 - Persuasion Credits: 3
• COMM 454 - Free Speech and Ethics Credits: 3

Notes:

Of the 6 credits of elective courses and 12 credits in an approved concentration, at least 12 credits must be at the 300-400 level and no more than 6 credits may be in COMM 450 - Internship.

No more than 9 credits of internship (COMM 450 or GOVT 450) in total may be applied to the 120 credits required for a degree.

In addition, 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: 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

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 beyond the 3 credits used to satisfy the university general education requirement. Students must earn a C or better in all courses applied to the minor.

**One required course (3 credits):**

- COMM 200 - Introduction to Communication 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:**

- 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

**Note:**

COMM 399 - Special Topics in Communication, when it is PPI, may be applied to this requirement with prior approval of the director of the minor.

**Two elective courses (6 credits) in communication**
Electronic Journalism Minor

Banner Code: EJ

Electronic journalism provides a foundation in journalism with a focus on the writing style and research techniques unique to broadcast, on line, and computer-assisted reporting.

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
- COMM 361 - Online Journalism Credits: 3
- COMM 475 - Journalism Law Credits: 3

Two elective courses (6 credits) chosen from:

- COMM 203 - Introduction to Journalism Credits: 3
- COMM 352 - News Editing: Print and Beyond Credits: 3
- COMM 353 - Broadcast Journalism Credits: 3
- COMM 370 - Feature Writing Credits: 3
- COMM 435 - Computers and Communication Credits: 3
- COMM 454 - Free Speech and Ethics Credits: 3

Note:

COMM 399 - Special Topics in Communication or COMM 450 - Internship in Communication, when relevant, may be applied to this requirement with prior written approval of the coordinator of the minor.

Sport Communication Minor

Banner Code: SCOM

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 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 Credits: 3
  or
- SPMT 304 - Sport, Culture, and Society Credits: 3
- SPMT 430 - Sport Communication Credits: 3

Two elective courses (6 credits) chosen from:

- 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
- SPMT 302 - Sport and Ethics 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

Note:

Special topics courses, when relevant, may be used to fulfill this requirement with the prior written approval of the coordinator.

Master's Degree
Communication, MA

Banner Code: LA-MA-COM

The master of arts in communication examines the powerful role played by communication practices in contemporary society. The program has two major areas of emphasis: health and strategic communication.

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

Students must meet the admission standards and application requirements of the university. See the Graduate Admission Policies section of the catalog. In addition to fulfilling the university application requirements, applicants must submit

- Three letters of recommendation
- Evidence of GRE taken within the past five years
- 500-word essay addressing the communication area in which the applicant is interested
- Résumé

Admission to the graduate programs in communication is competitive. Meeting the minimum admission criteria does not guarantee admission.

Degree Requirements

Student pursuing the degree must complete 33 credits of graduate course work distributed as follows:

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

One practicum course (3 credits)

- COMM 604 - Communication Research Practicum Credits: 3
• COMM 621 - Media Advocacy for Nonprofit Organizations Credits: 3
• COMM 653 - Graduate Communication: Research and Teaching Credits: 3
• COMM 655 - Theories of Visual Communication in Telecommunications Credits: 3
• COMM 694 - Communication Internship Credits: 3-6
• COMM 697 - Independent Production Credits: 1-3
• COMM 721 - E-Health Communication Credits: 3
• COMM 820 - Health Communication Campaigns Credits: 3
• COMM 590 - Seminar in Communication Credits: 3

Note:

Other courses including independent study can be used to fulfill this requirement with prior written approval of the director of graduate studies.

Elective courses (12 to 15 credits)

• Chosen from graduate communication courses, including those listed above under theory or practicum. Students may take up to 6 credits of course work outside the department with prior approval of the director of graduate studies.

Thesis option (3 credits)

• Students electing the thesis option should consult the section on Master’s Thesis in the Academic Policies section of this catalog.

Doctoral Degree

Communication, PhD

Banner Code: LA-PHD-COM

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.

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.

Degree Requirements

To receive the PhD in communication, students must complete a minimum of 60 credits 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.

One required course (3 credits):
Three 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):

- COMM 650 - Research Methodologies in Communication Credits: 3
- COMM 725 - Qualitative Methods Credits: 3
- COMM 750 - Research Methods II Credits: 3

Note:

Other 700-level courses, when relevant, may be used to fulfill this requirement with the prior written approval of the director.

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

Dissertation proposal and research (18 credits):

3 credits of:

• COMM 998 - Doctoral Dissertation Proposal Credits: 1-6

and 15 credits of:

• COMM 999 - Doctoral Dissertation Research Credits: 1-15

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.

Continuous Registration

Once enrolled in 998, students must maintain continuous registration for at least 1 credit; once enrolled in 999, students must follow the university continuous registration policy. A maximum of 3 credits of COMM 998 and 15 credits of COMM 999 may be applied toward the 60 credits required for the degree, although because of continuous registration policy, students may be required to register for additional credits of these courses.

■ Cultural Studies

Phone: 703-993-2851
Web: culturalstudies.gmu.edu
Faculty

Albanese, Amireh, Best, Bickford, Bockman, Burr, Censer, Chang, Copelman, Deshmukh, Foster, Froman, Fuchs, Gibson, Gilbert, Greet, Guagnano, Gusterson, Hanrahan, Hodges, Holt, Jacobs, Jann, Johnsen-Neshati, Kaplan, Kaposy, Karush, Kaufmann, Lancaster (director), Landsberg, Leeman, Lont, Mandaville, Matz, Miller, O'Connor, O'Malley, Palkovich, Rabin, Ricouart, Rosenblum, 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 thus 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. CULT 320 - Globalization and Culture is a core requirement for global affairs majors.

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 gender, sexuality, and body studies; visual culture and media studies; political economy and globalization; and race, ethnicity, and nation.

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. For students interested in cultural studies who do not meet this requirement, the university has established a number of related master's degrees. Students are encouraged to apply to one of these programs. See Graduate Programs in the English, History and Art History, Modern and Classical Languages, Philosophy, Religious Studies, and Sociology and Anthropology sections of this chapter. These programs cumulate in a capstone seminar, CULT 802.
Students may, if they wish, apply simultaneously to one of these master's degrees and the doctoral program simultaneously so that faculty may review their academic promise and suitability for the program. Students who wish to apply to two degree programs at the same time need to submit two separate applications. Especially strong candidates with bachelor's degrees may be admitted into the doctoral program on a conditional basis. Admission is contingent on their performance in the master's degree program, particularly in CULT 802.

**Doctoral Degree**

**Cultural Studies, PhD**

Banner Code: LA-PHD-CULT

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 the doctoral program in cultural studies must already have earned a master's degree in a relevant field. Students with only a bachelor's degree should apply to a master's program in a department that has an established related master's degree. See the Cultural Studies Program for more information.

In addition to materials required of all applicants for graduate study at Mason, applicants to cultural studies should submit the following:

- Scores on the GRE (general test is required; subject tests are optional)
- Three letters of recommendation from individuals who can judge the applicant’s scholarly potential
- Statement of purpose
- Writing sample demonstrating scholarly potential

**Degree Requirements**

As with all doctoral programs, the emphasis in this program is on the development of intellectual mastery and professional competence. The most important requirements are comprehensive exams and completion of a doctoral thesis that reflects the student’s ability to do original interdisciplinary work that meets professional standards. Students are required to demonstrate proficiency in at least one foreign language before being permitted to defend the doctoral dissertation proposal.

Students pursuing the doctorate in cultural studies must complete 48 credits beyond the master's degree.

**Three core courses (9 credits):**

- CULT 802 - Histories of Cultural Studies Credits: 3
- CULT 806 - Research Seminar in Cultural Studies Credits: 3
- CULT 808 - Student/Faculty Colloquium in Cultural Studies Credits: 1

**Note:**
Students must register for 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: Race, Ethnicity, Nationalism Credits: 3

**One course (3 credits) in a topic chosen from:**

- CULT 812 - Visual and Performance Culture Credits: 3
- CULT 816 - Science/Technology Credits: 3
- CULT 818 - Social Institutions Credits: 3

**One course (3 credits) in methodology**

- Students choose a course in a relevant methodology in which they are not already trained from departmental graduate offerings (600 level or above) under the guidance of faculty advisory committees.

**Field Requirements (18 credits)**

- Students must take a minimum of 3 courses in two fields. Under the guidance of faculty advisory committees, students select 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. As part of the minimum 9-credit field requirement, students must take a 3-credit directed readings course, CULT 870, in each field with that field’s primary advisor. Students demonstrate competence in each field by producing and orally defending a field statement that consists of a comprehensive, critical literature review.

**Oral defense**

- Oral defense of two written field statements (See Field Requirements section above)

**Proficiency in a foreign language**

**Dissertation research (12 credits):**

- CULT 998 - Doctoral Dissertation Proposal Credits: 1-6
- CULT 999 - Doctoral Dissertation Credits: 1-12

**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 two written field statements and pass an oral comprehensive exam based on them.

Continuous Registration

Students are required to register for a minimum of 3 credits of 998 or 999 each semester until they have completed the minimum number of credits of 998 and 999 required on their program of study. Once enrolled in 998, a student must maintain continuous registration in 998 or 999 each semester until the dissertation is submitted to and accepted by the University Library.

■ Economics

Phone: 703-993-1130
Web: economics.gmu.edu

Faculty

Distinguished professor emeriti: Buchanan, Smith, Tullock

Professors: Bennett, Boettke, Boudreaux, Congleton, Cowen, Crain, Heiner, Houser (chair), Klein, Levy, McCabe, Nye, Richardson, Roberts, Rowley, Stratmann, Wagner, Williams

Associate professors: Caplan, Hanson, Meyer, Ramirez, Reid, Tabarrok, Thorbecke, Wiest

Assistant professors: Al-Ubaydli, Johnson, Jones, Leeson

Instructor: Rustici

Professors emeriti: Chung (emeritus), Phillips (emeritus), Snavely (emeritus), Vaughn (emerita)

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 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.

The bachelor of arts degree program is designed primarily for students with a stronger interest in the liberal arts. It is appropriate for those who prefer a less quantitative degree program and may be especially appropriate 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 teaching and research 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.

Undergraduate Degree

Economics, BA

Banner Code: LA-BA-ECON

This program is designed primarily for students with a stronger interest in the liberal arts. It is appropriate for those who prefer a less quantitative degree program 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 CHSS 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

In addition to satisfying university general education requirements and the requirements for a bachelor of arts 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 in ECON courses.

Six required courses (18 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
• IT 103 - Introduction to Computing Credits: 3

One or two courses in statistics (4 or 6 credits)

• OM 210 - Statistical Analysis for Management Credits: 4
  or
• STAT 250 - Introductory Statistics I Credits: 3
• STAT 350 - Introductory Statistics II Credits: 3

Eight elective courses (24 credits)

• Chosen from courses in economics at the 300 and 400 level; ECON 385 may not be used to fulfill this requirement.

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 320, 345, 350, 360, or 365.

Economics, BS

Banner Code: LA-BS-ECON

The bachelor of science degree 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 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
In addition to satisfying university general education requirements and the requirements for a bachelor of science degree in the College of Humanities and Social Sciences, students pursuing the BS in economics must complete 57-59 credits of course work, earning a minimum GPA of 2.00 in ECON courses.

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

One course (3 credits) chosen from:

- ACCT 203 - Survey of Accounting Credits: 3
- STAT 362 - Introduction to Computer Statistical Packages Credits: 3

One or two courses in statistics (4 or 6 credits):

- OM 210 - Statistical Analysis for Management Credits: 4
  or
- STAT 250 - Introductory Statistics I Credits: 3
- STAT 350 - Introductory Statistics II Credits: 3

Eight elective courses (24 credits)

- Chosen from courses in economics at the 300 and 400 level; ECON 385 may not be used to fulfill this requirement.

Note:

If ECON 340 Mathematical Economics is chosen as an elective, students need not take MATH 114; however, MATH 114 is strongly recommended for students considering graduate school in economics and 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.

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 320, 345, 350, 360, or 365.
Managerial Economics, BS (pending SCHEV approval)

Banner Code: LA-BS-MECN

The BS degree program in managerial economics provides students who wish to prepare for a career in the business sector an alternative to the traditional undergraduate program in the School of Management. The major in managerial economics places greater emphasis on the application of economic concepts and reasoning in analyzing management and finance decisions in the business sector. Relative to the BS in economics, the BS in managerial economics offers a course of study more focused on the business world.

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

In addition to satisfying university general education requirements and the requirements for a bachelor of science degree in the College of Humanities and Social Sciences, students majoring in managerial economics must complete the coursework below. Students must earn a minimum GPA of 2.00 in ECON courses.

Six required courses (18 credits) in economics:

- 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 311 - Intermediate Macroeconomics Credits: 3
- ECON 345 - Introduction to Econometrics Credits: 3

Two required courses (8 credits) in mathematics:

- MATH 113 - Analytic Geometry and Calculus I Credits: 4
- MATH 114 - Analytic Geometry and Calculus II Credits: 4

One or two required courses (4 or 6 credits) in statistics:

- OM 210 - Statistical Analysis for Management Credits: 4
  or
- STAT 250 - Introductory Statistics I Credits: 3
  and
- STAT 350 - Introductory Statistics II Credits: 3
Three required supporting courses (9 credits):

- ACCT 203 - Survey of Accounting Credits: 3
- IT 103 - Introduction to Computing Credits: 3
- SOM 301 - Business Models: A Learning by Writing Introduction Credits: 3

Six elective courses (18 credits) in economics:

Four elective courses (12 credits) in economics chosen from:

- ECON 310 - Money and Banking Credits: 3
- 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

Note:

With departmental approval, ECON 496 - Special Topics in Economics may be used to fulfill this requirement.

Two elective courses in economics 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 - Managing 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

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 320, 345, 350, 360, or 365.
Undergraduate Minor

Economic Systems Design Minor

Banner Code: ESD

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 the minor must complete 15 credits, distributed as follows.

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):

- Chosen in consultation with an advisor in the minor.

Typical courses include:

- 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

Economics Minor
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 21 credits in economics with a minimum GPA of 2.00.

A minimum of 9 credits of upper-level economics courses must be taken at Mason. 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.

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)

- Chosen from courses in economics at the 300 or 400 level; ECON 385 may not be used to fulfill this requirement.

Bachelor's/Accelerated Master's Program

Economics, BA or BS/Economics Accelerated MA

Highly qualified Mason undergraduates may apply to the accelerated master’s degree program and obtain both bachelor’s and master’s degrees in economics after satisfactory completion of 144 credits. Well-prepared undergraduates are encouraged to apply as they near completion of 90 credits. Admitted students are able to use up to 6 graduate credits in partial fulfillment of requirements for the undergraduate degree. On completion and conferral of the undergraduate degree with satisfactory performance (3.00 in each course, grade of B or better) in graduate courses, students are given advanced standing in the master’s program. All other master’s degree requirements must be met. Graduates are exceptionally well-prepared for a professional school or a PhD program in economics or a related discipline. Interested students should contact the department for details about the application process.

Master's Degree

Economics, MA

Banner Code: LA-MA-ECON
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 should hold an undergraduate degree, which does not have to be in economics, from an accredited institution. They should have satisfactorily completed intermediate microeconomics and macroeconomics and MATH 108 or equivalent, and at least one semester of calculus before enrolling in any graduate courses. Students entering the master’s program should be familiar with basic statistics as well. Students also should have earned a 3.00 GPA in the last two years of undergraduate work and in all economics courses, as well as satisfactory scores on the GRE (subject exam is optional).

All applicants must submit two letters of recommendation and a brief personal statement explaining their interest in the program.

Degree Requirements

Students pursuing this degree must complete 30 graduate credits with a cumulative GPA of 3.00.

Three required courses (9 credits):

- ECON 611 - Microeconomic Theory Credits: 3
- ECON 612 - Microeconomic Theory II Credits: 3
- ECON 615 - Macroeconomic Theory Credits: 3

Seven elective courses (21 credits)

- Chosen from courses in economics from any of the fields offered by the department.

Recommended Courses

- ECON 535 - Survey of Applied Econometrics Credits: 3
- ECON 630 - Mathematical Economics I Credits: 3

Note:

Students may receive departmental permission to substitute up to 6 credits of electives taken outside economics in closely related fields. Students may also elect the thesis option, which offers 6 credits for independent research and writing under the supervision of a faculty member in lieu of 6 credits of electives.

Comprehensive Exams
Students must pass comprehensive exams in micro- and macroeconomics. Exams are offered twice each year.

Notes:

Although the department does not guarantee availability of courses every semester, a typical first-year sequence includes ECON 611 and 630, and an elective in the fall, and ECON 612 and 615, and an elective in the spring. If possible, part-time students should arrange their work schedules to take two courses per semester in the first year.

Master’s degree students must enroll at the Arlington Campus for core theory courses.

**Master's Level Certificate**

**Economic Systems Design Graduate Certificate**

**Banner Code: LA-CERG-ECSD**

This certificate 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.

**Application Requirements**

The program is open to all students who hold a bachelor’s degree from an accredited university. Interested students not already in a degree program should submit an application for graduate studies.

**Certificate Requirements**

Students pursuing the certificate must complete 15 credits. 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.

Three graduate-level courses (9 credits) in economic systems design

Two elective courses (6 credits)

- Chosen in consultation with an advisor in economics

**Doctoral Degree**
Economics, PhD

Banner Code: LA-PHD-ECON

This program 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 should hold an undergraduate degree, which does not have to be in economics, from an accredited institution and have satisfactorily completed intermediate microeconomics and macroeconomics. They also should have one year of calculus, one year of statistics, and one semester each of matrix algebra and econometrics. Applicants should have earned a 3.00 GPA in the last two years of undergraduate work and in all economics courses, as well as received satisfactory scores on the GRE (subject exam is optional).

Applicants must submit two letters of recommendation and a brief personal statement explaining their interest in the program. The department accepts doctoral students only for the fall semester.

Reduction of Credit

Students who enter with a master’s degree in economics may have their credit requirement reduced by up to 30 credits at the discretion of the department with approval of the dean. Credit is not given for comprehensive and field exams from other universities.

Degree Requirements

In addition to satisfying the university requirements for all doctoral degrees, students must successfully complete 72 credits of course work with a cumulative GPA of 3.00 including exams. No more than two courses with a grade of 2.00 may be applied toward the degree.

Six required 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
Six to ten elective courses (18 to 30 credits)

Two courses in each of two fields listed below (12 credits):

Subject to course availability, the department offers exams in the following fields of study. Consult the department for the required courses for each field.

- Austrian economics
- Constitutional economics
- Economic history
- Economics and religion
- Experimental economics
- Industrial organization
- Institutions and Development
- Law and economics
- Monetary theory
- Public choice
- Public finance

Exams

- Field exams in two fields of study
- Comprehensive exams in microeconomics and macroeconomics

Dissertation (12 to 24 credits):

- ECON 998 - Doctoral Dissertation Proposal Research. Credits:
- ECON 999 - Doctoral Dissertation Research Credits: variable

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 in microeconomics and macroeconomics, as well as field exams in two knowledge areas. 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.

Continuous Registration

Once enrolled in 998, a student must maintain continuous registration in 998 or 999 each semester until the dissertation is submitted to and accepted by the University Library.

■ English
Faculty

Professors: Cheuse, D’Andrea (Robinson Professor), Foster, Goodwin, Hodges, Jann, Lathbury, Lowry, Nadeau, Pankey, Tichy

Associate professors: Albanese, Amireh, Anderson, Atkinson, Burr, Clark, Fuchs, Gallehr, Hawk, Holisky, Jones, Kaplan, Kaufmann, Keaney, Kuebrich, Lattanzi Shutika, Matz (chair), Mori, Rutledge, Weinberger, Yadav, Yocom, Zawacki

Assistant professors: Brkie, Chang, Eisner, Eyman, Habila, Harvey, Hoffmann, Keith, Lawrence, Lin, Lockwood, Maloux, Marcantonio, McCarthy, Michals, Reid, Rogers, Sample, Scarlata, Stanica, Widerhold, Wulf

Term associate professors: Koch, Michals, Miller, Samuelian, Scott, Taciuch, Thompson

Term assistant professors: Beach, Berg, Burnham, DeNys, DeFazio, Habib, Jacobs, Johnson, Lister, Matthews, McGeehan, Nanian, Nichols, Rudnicki, Saunders, Taylor, Williams

Term instructors: Hoy, Raffel, Scolaro

Adjunct assistant professors: Broyles, Cabral, Casal, Dreisonstok, Fletcher, Fowler, Humbertson, Johnston, Kuhta, Moody, Pabich, Redondo, Waldron

Adjunct instructors: Baker, Cooper, Dutta, Grogan-Barone, Johnston, Lawrence, McKinney, Morris, Rhein, Surrette

Course Work

The English Department offers all course work designated CL, ENGL, LING, and NAIS in the Courses chapter of this catalog.

Related Courses

Courses offered by other departments are occasionally crosslisted with English and given the ENGL course designator; such courses may be counted toward the English major.

Undergraduate Programs

The department offers a bachelor's degree in English, a versatile major with thirteen specialized concentrations that are designed to meet students' individual interests and career objectives. English majors can also pursue a special option in comparative literature or 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.

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 the honors course sequence and receive a 3.50 GPA in all courses counted toward the major and, separately, a minimum 3.50 GPA in their honors courses. Honors courses may simultaneously satisfy concentration and distribution requirements in the major.

Students may satisfy the honors course sequence in several ways:

- Students may take two sections of ENGL 414 Honors Seminar.
- Students may take one section of ENGL 414 Honors Seminar and ENGL 415 Honors Thesis Writing Seminar.
- Students in the creative writing concentration may take one section of ENGL 414 Honors Seminar and write a creative honors thesis in ENGL 416 Honors Independent Study.
- Students in the nonfiction concentration may take ENGL 416 Honors Independent Study in conjunction with an advanced course in nonfiction writing and complete a nonfiction thesis as part of ENGL 415 Honors Thesis Writing Seminar.

See the English Department for application procedures and other information.

**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, available to students in any major.

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 Interdisciplinary Minors 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 599. 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. Conferences are free to all Mason students, faculty, staff, and alumni. Writing Center tutors, who are graduate teaching assistants in the English Department, have been trained in current methods of composition instruction. They can help clients overcome writing anxiety, develop organizational and revision skills, and learn useful strategies for editing their own work. Appointments should be made by calling 703-993-1200 or stopping by the center in Robinson Hall A, Room 11, to schedule a session.
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 offers a terminal degree, the MFA in creative writing, with concentrations in fiction, poetry, and nonfiction.

Faculty from the department coordinate the concentration in Folklore in the master's degree in individualized studies (MAIS). See the ■ Interdisciplinary Studies (MAIS) section of this chapter for details.

Funding

The department 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 show satisfactory progress toward their degree.

Certificates

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 the certificates may be able to be applied to a degree. Students must apply and be admitted to a graduate certificate program.

Undergraduate Degree

English, BA

Banner Code: LA-BA-ENGL

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

In addition to satisfying university general education requirements and the requirements for a bachelor of arts degree in the College of Humanities and Social Sciences, students pursuing this degree must complete 30 credits (nine courses) in English beyond ENGL 302 with a minimum GPA of 2.00.
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.

One required course (6 credits):

- ENGL 325 - Dimensions of Writing and Literature Credits: 6

Note:

Fulfills the university writing-intensive requirement.

Four core courses (12 credits) distributed as follows:

One course (3 credits) in literature before 1800 chosen from:

- ENGL 335 - Shakespeare Credits: 3 (Histories and Comedies)
- ENGL 336 - Shakespeare Credits: 3 (Tragedies and Romances)
- ENGL 400 - Literature of the Middle Ages Credits: 3
- ENGL 401 - English Poetry and Prose of the 16th Century Credits: 3
- ENGL 402 - English Poetry and Prose of the 17th Century Credits: 3
- ENGL 404 - The Augustan Age Credits: 3
- ENGL 405 - The Age of Sensibility Credits: 3
- ENGL 431 - Medieval Intellectual Topics Credits: 3
- ENGL 440 - English Renaissance Drama Credits: 3
- ENGL 443 - Restoration and Eighteenth-Century Drama Credits: 3
- ENGL 450 - English Novel of the 18th Century Credits: 3
- ENGL 471 - Chaucer Credits: 3
- ENGL 472 - Spenser Credits: 3
- ENGL 474 - Milton Credits: 3

One course (3 credits) in literature before 1915 chosen from courses listed above and the following courses:

- ENGL 368 - Beginnings of African American Literature Through 1865 Credits: 3
- ENGL 370 - African American Literature: Reconstruction to 1903 Credits: 3
- ENGL 406 - English Poetry of the Romantic Period Credits: 3
- ENGL 407 - Prose and Poetry of the Victorian Period Credits: 3
- ENGL 423 - Colonial and Federalist American Literature Credits: 3
- ENGL 425 - Literature of the American Renaissance Credits: 3
- ENGL 436 - Nineteenth-Century Continental Novels in Translation Credits: 3
- ENGL 452 - Development of the American Novel to 1914 Credits: 3
- ENGL 453 - English Novel of the 19th Century Credits: 3
One course (3 credits) in minority, folkloric, or popular literary and cultural traditions chosen from:

- ENGL 333 - Folklore of the Americas Credits: 3
- ENGL 334 - Literary Approaches to Popular Culture Credits: 3
- ENGL 349 - Global Voices Credits: 3
- ENGL 350 - The Idea of a World Literature Credits: 3
- ENGL 368 - Beginnings of African American Literature Through 1865 Credits: 3
- ENGL 369 - Women and Literature Credits: 3
- ENGL 370 - African American Literature: Reconstruction to 1903 Credits: 3
- ENGL 371 - African American Literature Through 1946 Credits: 3
- ENGL 372 - Contemporary African American Literature Credits: 3
- ENGL 375 - Ethnic American Literature Credits: 3
- ENGL 439 - Literature in English Other Than British and American Credits: 3
- ENGL 460 - Critical Study of Children's Literature Credits: 3
- ENGL 479 - Ethnicity and Immigration in Folklore Credits: 3
- ENGL 480 - Folklore of the Spirit World Credits: 3
- ENGL 481 - Folk Arts and Folk Artists Credits: 3
- ENGL 491 - Special Topics in Folklore Credits: 3
- ENGL 492 - Science Fiction Credits: 3
- ENGL 493 - Special Topics in Popular Literature Credits: 3

One elective course (3 credits) above ENGL 302

Note:

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.

Four courses (12 credits) in one of the following concentrations:

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:

- ENGL 333 - Folklore of the Americas Credits: 3
- ENGL 368 - Beginnings of African American Literature Through 1865 Credits: 3
- ENGL 370 - African American Literature: Reconstruction to 1903 Credits: 3
- ENGL 371 - African American Literature Through 1946 Credits: 3
- ENGL 372 - Contemporary African American Literature Credits: 3
• ENGL 375 - Ethnic American Literature Credits: 3
• ENGL 380 - Recent American Fiction Credits: 3
• ENGL 390 - Recent American Poetry Credits: 3
• ENGL 423 - Colonial and Federalist American Literature Credits: 3
• ENGL 425 - Literature of the American Renaissance Credits: 3
• ENGL 447 - American Drama of the Twentieth Century Credits: 3
• ENGL 452 - Development of the American Novel to 1914 Credits: 3
• ENGL 454 - Development of the American Novel since 1914 Credits: 3
• ENGL 463 - American Poetry of the Twentieth Century Credits: 3
• ENGL 478 - Special Topics: American Authors Credits: 3
• ENGL 479 - Ethnicity and Immigration in Folklore Credits: 3

▲ Concentration in Creative Writing (CW)

Four courses (12 credits) chosen from:

• ENGL 344 - Introduction to Digital Writing in the Genres Credits: 3
• ENGL 397 - Poetry Writing Credits: 3
• ENGL 398 - Fiction Writing Credits: 3
• ENGL 399 - Creative Nonfiction Writing Credits: 3
• ENGL 458 - Advanced Fiction Writing Workshop Credits: 3
• ENGL 464 - Advanced Poetry Writing Workshop Credits: 3
• ENGL 497 - Special Topics in Creative Writing Credits: 3

▲ Concentration in Cultural Studies (CULT)

Four courses (12 credits) chosen from:

• ENGL 327 - Introduction to Cultural Studies Credits: 3
• ENGL 330 - Introduction to Literary Theory Credits: 3
• ENGL 332 - Introduction to Film Credits: 3
• ENGL 333 - Folklore of the Americas Credits: 3
• ENGL 334 - Literary Approaches to Popular Culture Credits: 3
• ENGL 338 - Cultural Constructions of Sexualities Credits: 3
• ENGL 349 - Global Voices Credits: 3
• ENGL 368 - Beginnings of African American Literature Through 1865 Credits: 3
• ENGL 369 - Women and Literature Credits: 3
• ENGL 370 - African American Literature: Reconstruction to 1903 Credits: 3
• ENGL 371 - African American Literature Through 1946 Credits: 3
• ENGL 372 - Contemporary African American Literature Credits: 3
• ENGL 460 - Critical Study of Children's Literature Credits: 3
• ENGL 479 - Ethnicity and Immigration in Folklore Credits: 3
• ENGL 490 - Special Topics in Film Credits: 3
• ENGL 491 - Special Topics in Folklore Credits: 3
• ENGL 493 - Special Topics in Popular Literature Credits: 3

Up to one course (3 credits) may be 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 - Sex and Gender in Contemporary Society Credits: 3
• WMST 300 - Current Issues in Women and Gender Studies Credits: 3
• WMST 330 - Feminist Theory Across the Disciplines Credits: 3

▲ Concentration in Drama (DRA)

Four courses (12 credits) chosen from:

• ENGL 335 - Shakespeare Credits: 3 (Histories and Comedies)
• ENGL 336 - Shakespeare Credits: 3 (Tragedies and Romances)
• ENGL 440 - English Renaissance Drama Credits: 3
• ENGL 443 - Restoration and Eighteenth-Century Drama Credits: 3
• ENGL 445 - English and Irish Drama of the Twentieth Century Credits: 3
• ENGL 447 - American Drama of the Twentieth Century Credits: 3
• ENGL 448 - Modern Drama Credits: 3
• ENGL 449 - Special Topics in Drama Credits: 3

Note:

A maximum of one course (3 credits) may be from courses on Shakespeare.

Up to one course (3 credits) may be from outside the English Department from:

• FREN 413 - French Literature of the Seventeenth Century: Classical Drama Credits: 3
• FREN 442 - Twentieth-Century Drama and Poetry Credits: 3
• 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)
Four courses (12 credits) chosen from:

- ENGL 380 - Recent American Fiction Credits: 3
- ENGL 398 - Fiction Writing Credits: 3
- ENGL 437 - Twentieth-Century Continental Novels in Translation Credits: 3
- ENGL 450 - English Novel of the 18th Century Credits: 3
- ENGL 452 - Development of the American Novel to 1914 Credits: 3
- ENGL 453 - English Novel of the 19th Century Credits: 3
- ENGL 454 - Development of the American Novel since 1914 Credits: 3
- ENGL 456 - English Novel of the Twentieth Century Credits: 3
- ENGL 459 - Special Topics in Fiction Credits: 3
- ENGL 460 - Critical Study of Children's Literature Credits: 3
- ENGL 492 - Science Fiction Credits: 3

At least one of the four courses (3 credits) must be in fiction before 1915 chosen from:

- ENGL 436 - Nineteenth-Century Continental Novels in Translation Credits: 3
- ENGL 450 - English Novel of the 18th Century Credits: 3
- ENGL 452 - Development of the American Novel to 1914 Credits: 3
- ENGL 453 - English Novel of the 19th Century Credits: 3

▲ Concentration in Film and Media Studies (FILM)

Four courses (12 credits) chosen from:

- ENGL 327 - Introduction to Cultural Studies Credits: 3
- ENGL 331 - Introduction to Documentary Credits: 3
- ENGL 332 - Introduction to Film Credits: 3
- ENGL 343 - Textual Media Credits: 3
- ENGL 421 - Topics in Film History Credits: 3
- ENGL 422 - Topics in Film Theory Credits: 3
- ENGL 490 - Special Topics in Film Credits: 3

Up to one course (3 credits) may be from outside the English Department 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 and Mythology (FML)

At least two courses (6 credits) in folklore and mythology chosen from:

- ENGL 311 - Writing Ethnography Credits: 3
- ENGL 333 - Folklore of the Americas Credits: 3
- ENGL 337 - Special Topics in Myth and Literature Credits: 3
- ENGL 479 - Ethnicity and Immigration in Folklore Credits: 3
- ENGL 480 - Folklore of the Spirit World Credits: 3
- ENGL 481 - Folk Arts and Folk Artists Credits: 3
- ENGL 491 - Special Topics in Folklore Credits: 3
- ENGL 498 - Internship: Special Topics Credits: 1-3
- ENGL 591 - Special Topics in Folklore Credits: 3

Up to one course (3 credits) may be from outside the English Department chosen from:

- ANTH 450 - Qualitative Methods: Nonstatistical Approaches in Culture and Social Research Credits: 3
  or
- CLAS 340 - Greek and Roman Epic Credits: 3

Up to two courses (6 credits) related to folklore and mythology chosen from:

- ENGL 327 - Introduction to Cultural Studies Credits: 3
- ENGL 335 - Shakespeare Credits: 3 (Histories and Comedies)
- ENGL 336 - Shakespeare Credits: 3 (Tragedies and Romances)
- ENGL 349 - Global Voices Credits: 3
- ENGL 368 - Beginnings of African American Literature Through 1865 Credits: 3
- ENGL 370 - African American Literature: Reconstruction to 1903 Credits: 3
- ENGL 371 - African American Literature Through 1946 Credits: 3
- ENGL 372 - Contemporary African American Literature Credits: 3
- ENGL 400 - Literature of the Middle Ages Credits: 3
- ENGL 445 - English and Irish Drama of the Twentieth Century Credits: 3
- ENGL 471 - Chaucer Credits: 3
- ENGL 472 - Spenser Credits: 3
- ENGL 474 - Milton Credits: 3

One course (3 credits) may be 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 303 - Peoples and Cultures of Selected Regions 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 - Cultures in Comparative Perspective 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
• RELI 351 - Religions of the Ancient Near East Credits: 3

▲ Concentration in Linguistics (LING)

One required course (3 credits):

• LING 326 - General Linguistics Credits: 3

Three courses (9 credits) chosen from:

• LING 322 - 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 - Descriptive Aspects of English Phonetics and Phonology 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:

• ENGL 335 - Shakespeare Credits: 3 (Histories and Comedies)
• ENGL 336 - Shakespeare Credits: 3 (Tragedies and Romances)
• ENGL 400 - Literature of the Middle Ages Credits: 3
• ENGL 401 - English Poetry and Prose of the 16th Century Credits: 3
• ENGL 402 - English Poetry and Prose of the 17th Century Credits: 3
• ENGL 431 - Medieval Intellectual Topics Credits: 3
• ENGL 440 - English Renaissance Drama Credits: 3
• ENGL 471 - Chaucer Credits: 3
• ENGL 472 - Spenser Credits: 3
• ENGL 473 - Special Studies in Shakespeare Credits: 3
• ENGL 474 - Milton Credits: 3

Up to one course (3 credits) may be 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
• HIST 321 - Early Modern England 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:

• ENGL 404 - The Augustan Age Credits: 3
• ENGL 405 - The Age of Sensibility Credits: 3
• ENGL 406 - English Poetry of the Romantic Period Credits: 3
• ENGL 407 - Prose and Poetry of the Victorian Period Credits: 3
• ENGL 443 - Restoration and Eighteenth-Century Drama Credits: 3
• ENGL 445 - English and Irish Drama of the Twentieth Century Credits: 3
• ENGL 450 - English Novel of the 18th Century Credits: 3
• ENGL 453 - English Novel of the 19th Century Credits: 3
• ENGL 456 - English Novel of the Twentieth Century Credits: 3
• ENGL 462 - English Poetry of the Twentieth Century Credits: 3

▲ Concentration in Nonfiction Writing and Rhetoric (NWR)
Four courses (12 credits) chosen from:

- ENGL 309 - Introduction to Nonfiction Writing Credits: 3
- ENGL 311 - Writing Ethnography Credits: 3
- ENGL 342 - Web Authoring and Design Credits: 3
- ENGL 343 - Textual Media Credits: 3
- ENGL 392 - Editing for Audience, Style, and Voice Credits: 3
- ENGL 399 - Creative Nonfiction Writing Credits: 3
- ENGL 410 - Professional and Technical Writing Credits: 3
- ENGL 489 - Advanced Nonfiction Writing Credits: 3
- ENGL 496 - Topics in Rhetoric and Writing Credits: 3
- ENGL 498 - Internship: Special Topics Credits: 1-3
- ENGL 503 - Theory and Practice of Editing Credits: 3
- ENGL 504 - Internship in Writing and Editing Credits: 3
- ENGL 505 - Computer-Assisted Publications Writing and Design Credits: 3

▲ Concentration in Poetry (POE)

Four courses (12 credits) chosen from:

- ENGL 335 - Shakespeare Credits: 3 (Histories and Comedies)
- ENGL 336 - Shakespeare Credits: 3 (Tragedies and Romances)
- ENGL 390 - Recent American Poetry Credits: 3
- ENGL 397 - Poetry Writing Credits: 3
- ENGL 400 - Literature of the Middle Ages Credits: 3
- ENGL 401 - English Poetry and Prose of the 16th Century Credits: 3
- ENGL 402 - English Poetry and Prose of the 17th Century Credits: 3
- ENGL 404 - The Augustan Age Credits: 3
- ENGL 406 - English Poetry of the Romantic Period Credits: 3
- ENGL 407 - Prose and Poetry of the Victorian Period Credits: 3
- ENGL 462 - English Poetry of the Twentieth Century Credits: 3
- ENGL 463 - American Poetry of the Twentieth Century Credits: 3
- ENGL 468 - Special Topics in Poetry Credits: 3
- ENGL 471 - Chaucer Credits: 3

▲ Concentration in World Literature (WLIT)

- Up to one course (3 credits) chosen from courses from the concentrations in Medieval and Renaissance Literature, American Literature, or Modern British Literature

At least two courses (6 credits) chosen from:

- ENGL 349 - Global Voices Credits: 3
• ENGL 350 - The Idea of a World Literature Credits: 3
• ENGL 436 - Nineteenth-Century Continental Novels in Translation Credits: 3
• ENGL 437 - Twentieth-Century Continental Novels in Translation Credits: 3
• ENGL 439 - Literature in English Other Than British and American Credits: 3
• ENGL 448 - Modern Drama Credits: 3

Up to one course (3 credits) in a relevant course from these approved courses:

• 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

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 ENGL 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, as appropriate for the student’s focus:

• ENGL 325 - 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

- Chosen from 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 ENGL, FREN, GERM, RUSS, SPAN, or other language
- ENGL 350 - The Idea of a World Literature Credits: 3
- ENGL 431 - Medieval Intellectual Topics Credits: 3
- ENGL 436 - Nineteenth-Century Continental Novels in Translation Credits: 3
- ENGL 437 - Twentieth-Century Continental Novels in Translation Credits: 3
- ENGL 439 - Literature in English Other Than British and American Credits: 3

Undergraduate Minor

English Minor

Banner Code: ENGL

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 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 this minor must complete 18 credits above ENGL 302 with a minimum GPA of 2.00.

One required course (6 credits):

- ENGL 325 - Dimensions of Writing and Literature Credits: 6
Three courses (9 credits) in English

- Chosen from courses in a concentration listed under the English major or three courses that satisfy the core requirements for the major

One elective course (3 credits)

Teaching English as a Second Language Minor

Banner Code: TESL

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. Students in the TESL minor must have approval from the director to register for the 500-level courses in the TESL program.

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 complete 18 credits, distributed as follows:

Five required courses (15 credits):

- LING 322 - English Grammar Credits: 3
- LING 326 - General Linguistics Credits: 3
- LING 521 - Applied Linguistics: Teaching English as a Second Language Credits: 3
- LING 523 - Descriptive Aspects of English Phonetics and Phonology Credits: 3
- LING 582 - Second Language Acquisition Credits: 3

One elective course (3 credits) chosen from:

- 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
- ENGL 327 - 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

Note:

Other suitable elective courses may be applied to the minor with the prior approval of the director.

Bachelor's/Accelerated Master's Program

BA/ English, Accelerated MA (Linguistics)

Highly qualified Mason undergraduates in any major may apply to the accelerated master’s degree program and obtain a BA in their chosen major and an MA in English with a concentration in linguistics after satisfactory completion of 144 credits. Well-prepared undergraduates are encouraged to apply as they near completion of 90 credits. Satisfactory performance in LING 326 and one other LING course are a prerequisite for admission.

Admitted students are able to use up to 6 graduate credits in partial fulfillment of requirements for the undergraduate degree. On completion and conferral of the undergraduate degree with satisfactory performance in graduate courses (minimum grade of 3.00 in each course), students are given advanced standing in the master’s program. All other master’s degree requirements must be met. Interested students should contact the director of linguistics for details about the application process.

Master's Degree

Creative Writing, MFA

Banner Code: LA-MFA-CW

The MFA program 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; however, such enrollments are allowed only with the instructor’s permission. Regular applicants to the MFA program who are denied admission may not take courses as non degree students. Students interested in taking a course as non degree should submit a brief letter of introduction and a writing sample to the professor at least one week before the start of classes.

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.

Application Requirements

In addition to fulfilling admission requirements for graduate study, applicants must submit two letters of recommendation, one copy of a 1,000-word analytical writing sample, and a portfolio of original work. The analytical writing sample may be a paper written for an undergraduate class or any other work that gives evidence of advanced writing skills. For those applying to the
MFA concentration in fiction, the portfolio should consist of up to 50 pages of fiction; at least two complete short stories are preferred. For those applying to the poetry concentration, the portfolio should consist of up to 20 pages of poetry. For those applying to the nonfiction concentration, the portfolio should consist of up to 50 pages of creative nonfiction.

Degree Requirements

Students pursuing this degree must successfully complete 48 graduate credits, distributed as follows:

Two to four courses (6 to 12 credits) in literature

Four to six courses (12 to 18 credits) in one of the following concentrations:

▲Concentration in Fiction (FIC)

One course (3 credits) in the form:

- ENGL 566 - Forms of Fiction Credits: 3

Writing workshops (9 credits):

- ENGL 618 - Fiction Writing Workshop Credits: 1-6
- ENGL 751 - Advanced Workshop in Fiction Writing Credits: 1-6

▲Concentration in Nonfiction (NFW)

One required course (3 credits):

Students should enroll the first semester it is offered after they enter the program.

- ENGL 506 - Research for Narrative Writing Credits: 3

One course (3 credits) in the form:

- ENGL 565 - Forms of Nonfiction Credits: 3

Writing workshops (9 credits):

- ENGL 616 - Nonfiction Writing Workshop Credits: 1-6
- ENGL 752 - Advanced Workshop in Nonfiction Writing Credits: 1-6
▲ Concentration in Poetry (POE)

One course (3 credits) in the form:

- ENGL 564 - Form of Poetry Credits: 3

Writing workshops (9 credits)

- ENGL 617 - Poetry Writing Workshop Credits: 1-6
- ENGL 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 ENGL 608 in another genre.

Elective courses (up to 15 credits)

- Chosen in consultation with the writing program faculty

Craft Seminars (6 to 12 credits):

- ENGL 608 - Craft Seminars Credits: 3

Workshop (1 credit):

- ENGL 699 - Workshop in English Credits: 1-3

Thesis (6 credits)

May be taken in the summer only with permission of the thesis committee.

- ENGL 799 - Thesis Credits: 1-6

Exam or Project

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 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). 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 ENGL 798 to fulfill this requirement. ENGL 798 may not be used to fulfill the literature requirement or as thesis preparation. The exam or project must be completed at least one semester before the student registers for the final 3 credits of thesis.

Note:

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.

English, MA

Banner Code: LA-MA-ENGL

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.

Application Requirements

In addition to fulfilling admission requirements for graduate study, applicants must submit one copy of a 1,500 to 2,000-word analytical writing sample and two letters of recommendation. For those applying in cultural studies, literature, professional writing and rhetoric, and the teaching of writing and literature, the writing sample should be an interpretive paper on a literary text. In addition to the writing sample, applicants must submit a goals statement of no more than 750 words. Applicants for the concentration in professional writing and rhetoric must also submit two copies of a 10- to 15-page portfolio of their nonfiction work such as a technical or business report, essay, term paper, editing project, or any other material reflecting interests and skills in nonfiction writing.

Applicants may submit scores from the GRE when they believe those scores will lead to a clearer representation of their qualifications. Those with undergraduate majors in disciplines other than English are encouraged to apply, but they may be required to make up deficiencies before entering the program.

Degree Requirements

Students pursuing this degree must successfully complete 30 credits in graduate English courses in one of the following concentrations.

Foreign Language Proficiency

Students in all concentrations must demonstrate proficiency in a foreign language by course work equivalent to Mason’s foreign language 210 or by passing a translation test administered by the department.

▲ Concentration in Cultural Studies (CULT)

Three required course (9 credits):
• ENGL 676 - Introduction to Cultural Studies Credits: 3
• ENGL 701 - Research in English Studies Credits: 3
• CULT 802 - Histories of Cultural Studies Credits: 3

Two courses (6 credits) chosen from:

• ENGL 551 - Literary Criticism Credits: 3
• ENGL 555 - Introduction to Cinema Studies Credits: 3
• ENGL 665 - Texts in Global Contexts Credits: 3
• ENGL 670 - Visual Culture: Theories and Histories Credits: 3
• ENGL 675 - Feminist Theory and Criticism Credits: 3
• ENGL 685 - Selected Topics, Movements, or Genres of Literature in English Credits: 3
• ENGL 705 - Literary Theory and Criticism Credits: 3
• ENGL 740 - Seminar in English/Cultural Studies Credits: 3

Note:

ENGL 685, 705, and 740 may be repeated once with permission of the director of graduate studies.

Five courses (15 credits) of literature

Thesis option: (6 credits)

If thesis option is chosen, the 6 credits in thesis substitute for 6 credits of literature.

• ENGL 799 - Thesis Credits: 1-6

▲ 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. The 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 can be earned concurrently. Students pursuing the linguistics concentration must successfully complete 30 graduate credits, distributed as follows, and demonstrate foreign language proficiency (see above).

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.

▲ Concentration in Literature (LIT)

One required course (3 credits):

- ENGL 701 - Research in English Studies Credits: 3

One course (3 credits) in critical theory, chosen from:

- ENGL 514 - Theories of Comparative Literature Credits: 3
- ENGL 551 - Literary Criticism Credits: 3
- ENGL 675 - Feminist Theory and Criticism Credits: 3
- ENGL 676 - Introduction to Cultural Studies Credits: 3
- ENGL 705 - Literary Theory and Criticism Credits: 3

Eight courses (24 credits) in literature

A maximum of 6 credits of related study outside the department may substitute for the equivalent number of literature credits, with permission of the graduate director.

Thesis option: (6 credits)

If thesis option is chosen, the 6 credits in thesis substitutes for 6 credits of literature.

- ENGL 799 - Thesis Credits: 1-6

▲ Concentration in Professional Writing and Rhetoric (PWR)

Two required courses (6 credits):

- ENGL 501 - Introduction to Professional Writing and Rhetoric Credits: 3
- ENGL 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

Three courses (9 credits) chosen from designated courses in literature and literary theory, linguistics, cultural studies, film and media studies, and folklore

Project or Thesis Option:

One elective course and 3 credits of project:

- ENGL 797 - Projects in Professional Writing and Rhetoric Credits: 3

or 6 credits of thesis:

- ENGL 799 - Thesis Credits: 1-6

▲ Concentration in the Teaching of Writing and Literature (TWL)

One required course (3 credits):

- ENGL 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, usually:

- LING 522 - Modern English Grammar Credits: 3

Two courses (6 credits) in the teaching of writing and in the teaching of literature, usually:

- ENGL 615 - Proseminar in Composition Instruction Credits: 3
- ENGL 610 - Proseminar in Teaching the Reading of Literature Credits: 3
One course (3 credits) in composition theory:

- ENGL 697 - Composition Theory Credits: 3
  or an appropriate section of
- ENGL 611 - Studies in Rhetoric Credits: 3

One elective course (3 credits) in literature or writing

Thesis option (6 credits):

A thesis may be arranged through the advisor and director of graduate studies in English; this option requires 6 credits and expands the degree program from 30 to 33 credits.

- ENGL 799 - Thesis Credits: 1-6

**Master's Level Certificate**

**Folklore Graduate Certificate**

Banner Code: LA-CERG-FLK

The certificate in folklore 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 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 the humanities.

This program of study is offered by the Department of English.

**Certificate Requirements**

Students pursuing this certificate must complete 18 credits.

**Core courses (15 credits):**

- ENGL 591 - Special Topics in Folklore Credits: 3
  (may be repeated for different topics)
- ENGL 798 - Directed Reading and Research Credits: 1-3
- ANTH 750 - Ethnographic Genres Credits: 3

One research course (3 credits) chosen from:
Professional Writing and Rhetoric Graduate Certificate

Banner Code: LA-CERG-PWR

This certificate provides graduate 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.

This program of study is offered by the Department of English.

For policies governing all certificates, see the Academic Policies chapter of the catalog.

Application Requirements

Applicants must submit an analytical writing sample of at least 1,000 words, a goals statement, two letters of recommendation, and a portfolio of writing or editing. Applicants must be currently admitted to a graduate degree program or approved for enrollment as nondegree students. Because only 6 credits earned as a nondegree student may be applied to the certificate, students who initially take courses as nondegree should apply for admission before completing 6 credits of course work. Completion of course work is not in itself a guarantee of admission to the certificate program.

The certificate may be pursued concurrently with any of several degree programs in English and elsewhere. Part of the course work toward the certificate may be applied to those degrees.

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):

- ENGL 501 - Introduction to Professional Writing and Rhetoric Credits: 3

One course (3 credits) in research methods:

- ENGL 502 - Research Methods in Rhetoric and Professional Writing Credits: 3

Two courses (6 credits) in professional writing and rhetoric chosen from:

- ENGL 503 - Theory and Practice of Editing Credits: 3
- ENGL 504 - Internship in Writing and Editing Credits: 3
- ENGL 508 - Digital Rhetoric and Design Credits: 3
- ENGL 611 - Studies in Rhetoric Credits: 3
- ENGL 612 - Cultures of Professional Writing Credits: 3
- ENGL 613 - Technical and Scientific Writing Credits: 3
- ENGL 697 - Composition Theory Credits: 3

One course (3 credits) in nonfiction writing chosen from:

- ENGL 565 - Forms of Nonfiction Credits: 3
- ENGL 506 - Research for Narrative Writing Credits: 3
- ENGL 615 - Proseminar in Composition Instruction Credits: 3
- ENGL 619 - Special Topics in Writing Credits: 3
- ENGL 695 - Northern Virginia Writing Project Inservice Program Credits: 1, 2, 3
- ENGL 699 - Workshop in English Credits: 1-3

One elective course (3 credits)

Teaching English as a Second Language Graduate Certificate

Banner Code: LA-CERG-TESL

The Teaching English as a Second Language (TESL) certificate 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.

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.

Application Requirements

Applicants must be admitted to graduate study or approved for graduate course enrollment as nondegree students. Students who initially enroll in the certificate program as nondegree must apply for admission to the graduate program no later than the second semester of study. When formal admission to graduate study is sought, applicants must submit one copy of an analytical writing sample of approximately 1,000 words, a goals statement, and two letters of recommendation.

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. Students enrolled in another graduate degree program who want to work for the certificate must apply to the English Department for admission into the certificate program.

Certificate Requirements

Students pursuing this certificate must complete 18 credits, earning a grade of 3.00 or better.
Six required courses (18 credits):

- LING 520 - Descriptive Linguistics Credits: 3
- LING 521 - Applied Linguistics: Teaching English as a Second Language Credits: 3
- LING 522 - Modern English Grammar Credits: 3
- LING 523 - Descriptive Aspects of English Phonetics and Phonology Credits: 3
- LING 525 - Practicum in ESL Credits: 3
- LING 582 - Second Language Acquisition Credits: 3

Doctoral Degree

Linguistics, PhD

Banner Code: LA-PHD-LING

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

This program is open to students with any undergraduate major, though all applicants should have satisfactorily completed an introductory course in linguistics.

An applicant must submit three letters of recommendation, score on the GRE, a one or two page personal statement explaining the applicant’s interest in the program, and an academic writing sample that is preferably at least ten pages in length and of some theoretical rigor. The department accepts doctoral students only for the fall semester.

Degree Requirements

To receive the PhD, students are must complete a minimum of 72 credits of course work, of which no more than 24 credits may be in LING 998/999. Students must submit two qualifying papers in linguistics. Students who enter with a master’s degree in linguistics may have their credit requirement reduced by up to 30 credits at the discretion of the department.

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

Seminars (6 credits):

- Two seminar courses in two chosen fields

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 - Descriptive Aspects of English Phonetics and Phonology 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
- ENGL 592 - Historical Studies of the English Language Credits: 3
- FREN 560 - History of the French Language Credits: 3
- FREN 575 - Grammatical Analysis Credits: 3
- FRLN 565 - Theory of Translation Credits: 3
• SOCI 531 - 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
• CSI 606 - Scientific Graphics and Visualization Tools Credits: 1
• CSI 607 - Database Tools for Scientists Credits: 1
• 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):
• LING 898 - Advanced Independent Study Credits: 3

Doctoral Dissertation (12 credits):
• LING 998 - Doctoral Dissertation Proposal Credits: 1-6
• LING 999 - Doctoral Dissertation Credits: 1-12

Total: 72 credits

Global Affairs

Web: globalaffairs.gmu.edu

Course Work

The Global Affairs programs offer all course work designated GLOA in the Courses chapter of this catalog.

Undergraduate Programs

Phone: 703-993-9185

Faculty

Bachelor's Degree

The bachelor's degree in global affairs is an interdisciplinary 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. They also 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, and so on) 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.

Global Affairs with a Second Major

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.

Minors

The undergraduate program in global affairs offers a minor in global affairs, which is available to students in any major in the university.

Students majoring in global affairs are encouraged to complement their major one of the many minors offered by the college.

Graduate Programs

Phone: 703-993-2152

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, sometimes within five years.
Undergraduate Degree

Global Affairs, BA

Banner Code: LA-BA-GLOA

Global affairs is an interdisciplinary major that introduces students to the global processes affecting all societies. Study abroad and internships are strongly encouraged. Students can complement their major with a second major or a minor.

This program of study is offered by the Global Affairs Program.

For policies governing all undergraduate degrees, see the Academic Policies chapter of the catalog.

Degree Requirements

In addition to satisfying university general education requirements and the requirements for a bachelor of arts 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 major. 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
  or
- 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:

GOVT 132 or 133 is a prerequisite to GOVT 322.

6-9 credits of language study beyond intermediate proficiency

- Three courses (9 credits) beyond 210, or
- Two courses (6 credits) beyond 202

Four courses (12 credits) in an approved concentration

Courses applied to a global affairs concentration should come from two different departments. They have to 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, may be applied to a concentration with prior written approval from the director.

By Global Topic

▲ The Environment (EVT)

Choose 12 credits from the following:

- ANTH 370 - Environment and Culture Credits: 3
- BIOL 301 - Biology and Society Credits: 3
- 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
- GEOG 303 - Conservation of Resources and Environment Credits: 3
- GEOG 311 - Introduction to Geographic Information Systems Credits: 3
- GEOL 309 - Introduction to Oceanography Credits: 3
- TOUR 312 - Ecotourism Credits: 3
- TOUR 340 - Sustainable Tourism Credits: 3

▲ Global Communications and Technology (GCT)

Choose 12 credits from the following:

- ANTH 332 - Cultures in Comparative Perspective Credits: 3
- COMM 202 - Mass Media and Communication Systems 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
- COMM 554 - Telecommunications Policy and Regulation 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
▲ Global Economy and Management (GEM)

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

Note:

BULE courses require the approval of the director.

▲ Global Inequalities and Responses (GIR)

Choose 12 credits from the following:

- ADJ 405 - Law and Justice around the World Credits: 3
- ANTH 365 - Race and Racism Credits: 3
- ANTH 488 - Gender, Sexuality, and Culture Credits: 3
- GEOG 304 - Geography of Population 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 - Racial and Ethnic Relations Credits: 3
- SOCI 315 - Sex and Gender in Contemporary Society Credits: 3
- SOCI 475 - Women and the Law Credits: 3
- WMST 100 - Representations of Women Credits: 3

▲ International Development (IDEV)

Choose 12 credits from the following:

- ANTH 331 - Refugees Credits: 3
- ANTH 333 - Humanitarian Action 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
- GEOG 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: 3-15
- PHIL 429 - International Ethics Credits: 3
- SOCI 350 - Community, Diversity, and Democracy: A Practicum Credits: 3
- SOCW 351 - Social Policy and Social Justice I Credits: 3
- TOUR 340 - Sustainable Tourism Credits: 3

▲ 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: Twentieth Century Credits: 3
- DANC 418 - Global Dance Intensive Credits: 1-3
- ENGL 333 - Folklore of the Americas Credits: 3
- ENGL 349 - Global Voices Credits: 3
- ENGL 350 - The Idea of a World Literature Credits: 3
- ENGL 380 - Recent American Fiction Credits: 3
- ENGL 439 - Literature in English Other Than British and American Credits: 3
- FREN 325 - Major French Writers Credits: 3
- FREN 378 - Survey of French Literature: 1800 to Present Credits: 3
- FREN 451 - Sub-Saharan African Literature Credits: 3
- FREN 452 - French-Canadian Literature Credits: 3
- FREN 453 - Francophone Literature from North Africa Credits: 3
• FREN 454 - Caribbean Literature in French Credits: 3
• FREN 470 - Topics in French Cinema Credits: 3
• FRLN 330 - Topics in World Literature 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
• JAPA 320 - Japanese Cinema Credits: 3
• RUSS 325 - Major Russian Writers Credits: 3
• RUSS 327 - A Survey of Russian Literature Credits: 3
• RUSS 470 - Topics in (Post) Soviet Film Credits: 3
• SPAN 321 - Introduction to Spanish Culture Credits: 3
• SPAN 325 - Major Hispanic Writers Credits: 3
• THR 359 - World Stages Credits: 3

▲ Global Governance (GLGV)

Choose 12 credits from the following:

• ADJ 405 - Law and Justice around the World Credits: 3
• ADJ 475 - Theory and Politics of Terrorism Credits: 3
• ANTH 312 - Political Anthropology Credits: 3
• COMM 305 - Foundations of Intercultural Communication Credits: 3
• GEOG 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 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
• HIST 345 - History of American Foreign Relations Credits: 3
• NCLC 305 - Conflict Resolution and Transformation Credits: 6
• NCLC 422 - An Experiential Approach to American Foreign Policy Credits: 3-15
• PHIL 429 - International Ethics Credits: 3
• SOCI 340 - Power, Politics, and Society Credits: 3

By World Region

▲ Africa (AFR)

Choose 12 credits from the following:

• ARTH 380 - African Art Credits: 3
• ECON 362 - African Economic Development Credits: 3
• FREN 451 - Sub-Saharan African Literature Credits: 3
• GOVT 432 - Political Change and Social Development in Sub-Saharan Africa Credits: 3
• HIST 261 - Survey of African Civilization Credits: 3
• HIST 262 - Survey of African Civilization 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

▲ Asia (ASA)

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 311 - Modern Chinese Literature in Translation 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 355 - Women and Family in Chinese History Credits: 3
• HIST 356 - Modern Japan Credits: 3
• HIST 357 - Postwar Japan Credits: 3
• JAPA 320 - Japanese Cinema Credits: 3
• RELI 212 - Religions of the Orient Credits: 3

▲ Europe (EU)

Choose 12 credits from the following:

• ARTH 360 - Nineteenth-Century European Art Credits: 3
• ARTH 362 - Twentieth-Century European Art Credits: 3
• FREN 325 - Major French Writers Credits: 3
• FREN 378 - Survey of French Literature: 1800 to Present Credits: 3
• FREN 470 - Topics in French Cinema Credits: 3
• GEOG 320 - Geography of Europe 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
• 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

▲ Latin America (LA)

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
• GEOG 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

▲ Middle East and North Africa (MNA)

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 - Francophone Literature from North Africa Credits: 3
• GEOG 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
• HIST 281 - Survey of Middle Eastern Civilization Credits: 3
• HIST 282 - Survey of Middle Eastern Civilization Credits: 3
• HIST 461 - Arab-Israeli Conflict Credits: 3
• HIST 465 - The Middle East in the 20th Century Credits: 3
• RELI 211 - Religions of the Near (Middle) East Credits: 3

▲ North America (NA)

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
• ENGL 380 - Recent American Fiction Credits: 3
• ENGL 390 - Recent American Poetry Credits: 3
• FREN 452 - French-Canadian Literature Credits: 3
• GEOG 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 1976 Credits: 3
• HIST 336 - The African American Experience in the United States: Reconstruction to the Present Credits: 3
• HIST 337 - The Vietnam War Credits: 3
• HIST 340 - History of American Racial Thought Credits: 3
• HIST 345 - History of American Foreign Relations 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 418 - Ethnic Groups in America Credits: 3
• USST 401 - Seminar: The Future of Metropolitan America Credits: 3

▲ Russia and Central Asia (RCA)

Choose 12 credits from the following:

• GEOG 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 329 - Modern Russia and the Soviet Union 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

▲ Individualized Concentration (IST)

Students may construct an individualized concentration with the director’s help and written approval.

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.

Undergraduate Minor

Global Affairs Minor

Banner Code: GLOA

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 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 distributed as follows:

• 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

BA/Global Affairs Accelerated MA

Highly qualified undergraduates in any major may apply to the accelerated master's degree program 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.

Well-prepared undergraduates are encouraged to apply as they near completion of 90 credits. Admitted students are able to use up to 6 graduate credits (courses at the 500 or 600 level) in partial fulfillment of requirements for the undergraduate degree. On completion and conferral of the undergraduate degree with satisfactory performance in graduate courses (minimum grade of 3.00 in each course), students are given advanced standing in the master's program. A maximum of 6 graduate credits may also be taken as reserve graduate credit and only applied to the master's degree. All other master's degree requirements must be met.

Applicants must have a cumulative GPA of 3.40 or higher and submit an application, two letters of recommendation, a writing sample, and evidence of advanced professional competency in a second language (other than English) that is widely used in contemporary international communication. Applications for the accelerated master's program may be obtained from the director of the graduate program in global affairs.

Master's Degree

Global Affairs, MA

Banner Code: LA-MA-GLOA

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 reflect the strengths of George Mason in the global arena including global economics and development, international management, international education, international health. They 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 or thesis. Graduates of the program are prepared for careers in a wide variety of international contexts.

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 the master's degree in global affairs must meet the university admission standards and the application requirements for graduate study. See the Graduate Admission Policies section of the catalog. In addition, applicants must submit two letters of
recommendation from individuals familiar with the applicant’s qualifications for graduate study and a satisfactory score on the GRE.

Applicants will need to present evidence an advanced professional competency in a second language (other than English) that is widely used in contemporary international communication. Evidence of language competency may be demonstrated either through testing by Language Testing International or through other means approved by the College of Humanities and Social Sciences.

Degree Requirements

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:

- ITRN 602 - International Financial Institutions and Globalization Credits: 3
- ITRN 603 - International Trade Relations Credits: 3
- GCH 560 - Environmental Health Credits: 3

Four courses (12 credits) in a specialization

The specialization is developed in consultation with an advisor and approved by the director of the program. Specializations reflect the strengths of George Mason in the global arena including global economics and development, international management, international education, international health.

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.
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. Students must apply and be accepted to a graduate certificate program.

Master's Level Certificate

College Teaching Graduate Certificate

Banner Code: LA-CERG-CTCH

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.

Students must apply for admission to the certificate program and meet the admission standards and application requirements for all graduate students as stated in the Graduate Admissions Policies section.

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.

Certificate Requirements

Students pursuing this certificate must complete 18 credits. They may substitute courses with a disciplinary focus for any of the three required courses, with prior written approval of the director.

Three required courses (9 credits):

- CTCH 602 - College Teaching Credits: 3
- CTCH 603 - Technology in Higher Education Credits: 3
- 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)
Electives should be chosen in consultation with an advisor and with approval of the director.

Total: 18 credits

Higher Education Administration Graduate Certificate

Banner Code: LA-CERG-HEDA

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.

Students must apply for admission to the certificate program and meet the admission standards and application requirements for all graduate students as stated in the Graduate Admissions Policies section of the Admission chapter.

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.

Certificate Requirements

Students pursuing this certificate must complete 18 credits:

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 the list below:

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

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 four core areas related to undergraduate education: scholarly activity related to teaching and learning; effective integration of technology in the teaching and learning process; pedagogy appropriate to the discipline; and program and curriculum design, development, and assessment. 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

Students are accepted for the fall and spring semesters. Applications submitted after the posted deadline will be considered on a space-available basis. In addition to meeting admission requirements for graduate study at Mason, applicants should have a master’s degree, and submit a writing sample, a statement of purpose, three letters of recommendation, GRE scores, and a résumé.

Knowledge Area

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.

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.

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 revised program of study.
Degree Requirements

Students pursuing this degree must complete a minimum of 60 credits beyond the master’s degree, distributed as follows:

Knowledge area (21 credits), including 3 credits of methodology

Four courses (12 credits) in the education core:

- 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) from approved list of courses

One course (3 credits) in research design or methods

Internships (6 credits):

- CTCH 885 - Doctoral Internship in College Teaching and Administration Credits: 3

Note:

Students participate in 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. Students doing an internship should have completed 18 credits of education core requirements, 6 credits in the knowledge area, 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.

Dissertation (12 credits):

- CTCH 998 - Doctoral Dissertation Proposal Credits: 1-3
- CTCH 999 - Doctoral Dissertation Credits: 1-12

Candidacy Exams

Students must pass candidacy exams to demonstrate breadth and depth of knowledge in both the knowledge area and education core. To be eligible to take a candidacy exam, students need to 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 competency exam for the education core
is a written exam administered 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 candidacy 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 candidacy exam the second time will be terminated from the program.

Continuous Registration

Once enrolled in 998, students must maintain continuous registration in 998 or 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.

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 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.

Dissertation

In the dissertation, students demonstrate an 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.

To register for dissertation proposal (998), students need to have an approved program of study and must have completed the two internships, all other course work, and candidacy exams in the education core and the knowledge area. To register for dissertation research (999), students must be advanced to candidacy. 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.

Students are required to take at least 3 credits of doctoral dissertation proposal (998) and 3 credits of doctoral dissertation (999), and must complete a total of 12 credits of 998 and 999 combined. Once enrolled in 999, students must maintain continuous registration in 999 each semester until graduation, excluding summers. Once they meet the 12 credit requirement, they may register for 1 credit of 999 per semester to maintain enrollment. Students who defend in the summer must be registered for at least 1 credit of 999 in the summer.

■ History and Art History

Phone: 703-993-1250
Web: historyarthistory.gmu.edu

Faculty

Mathy Professor: Mattusch (art history)
Robinson Professor: Crew, Bakhash (history)
**Professors:** J. R. Censer (dean), J. T. Censer, Holt, Kierner, Petrik, Sherwin, Stearns (provost), Stewart, Wade, Zagarri (history)

**Associate professors:** Bristol, Carton, Chang, Cohen, Copelman, Deshmukh, Hamdani, Karush, Kelly, Landsberg, Lytton, O’Malley, Platt (chair), Scully, Smith (history); Butler, DeCaroli (director), Todd (art history)

**Assistant professors:** Barnes, Bottoms, Bristol, Collins, Hamner, Lair, McDow, Schrag (history); Greet (art history)

**Term faculty:** Leon, Manuel-Scott, McCord, Orens, Scheinfeldt, Schrum, Walmsley (history); Gregg, Richardson (art history)

**Postdoctoral teaching fellows:** Hudgins, Salinas, Scales, Wolf

## Course Work

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 one of 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. 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 a 3.50 overall GPA and a 3.50 GPA in history 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.

To graduate with honors in the major, students must 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. These 6 credits must be passed with a minimum 3.50 GPA, and the overall history GPA presented for graduation must be a minimum of 3.50. These 6 credits may be counted toward the 36-credit major requirement in history, but they do not replace HIST 499.

### Minors
The department offers a minor in history available to students in any major.

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 credits toward these minors by taking selected history and art history courses. For details, see the 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 section in the College of Education and Human Development chapter of the catalog.

**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 a 3.50 overall GPA and a 3.80 GPA 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.

To graduate with honors in the major, students must 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. These 6 credits must be passed with a minimum 3.50 GPA, and the overall art history GPA presented for graduation must be a minimum of 3.50. These 6 credits may be counted toward the 33- to 34-credit major requirement in art history, but they do not 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.

The Art History Program coordinates the Ancient Mediterranean Art and Archaeology Minor. See the 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-ARTH

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
In addition to satisfying university general education requirements and requirements for a bachelor of arts 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.

**One survey course (3 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

**One museum course (3 credits):**

- ARTH 394 - The Museum Credits: 3

**Five courses (15 credits) in ARTH at the 300 level**

**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 additional course (3 credits) in ARTH at the 400 level or above**

**One course (3 or 4 credits) in AVT chosen from:**

- AVT 103 - Introduction to the Artist's Studio Credits: 3
- AVT 104 - Studio Fundamentals I Credits: 4

**One elective course (3 credits) chosen from:**

- One course (3 credits) in ARTH at the 100 or 200 level
- One course (3 credits) at the 300-level
- Other courses, with prior written approval of the director of the undergraduate program
Notes:

All art history majors are encouraged to pursue internships in art history (ARTH 393 or, with permission, ARTH 593) 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 recommended to participate in a study abroad program. 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.

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

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

In addition to satisfying university general education requirements and the requirements for a bachelor of arts 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 counting toward the major.

Two courses (6 credits) of U.S. history

Two courses (6 credits) of European history

- HIST 100 - History of Western Civilization used to fulfill the university-wide general education requirement in western civilization may be used to fulfill one course (3 credits) of this requirement.

Two courses (6 credits) of global, Latin American, African, Asian, or Middle Eastern history

- Approved history courses 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.

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

- Chosen from courses in history at the 300 or 400 levels if necessary to complete the 18-credit, upper-level history requirement

Note:

HIST 300 and 499 may not be used to satisfy the first three requirements. 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.

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 Minor

Art History Minor

Banner Code: ARTH

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.

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
History Minor

Banner Code: HIST

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.

The program must be approved by the undergraduate director before graduation.

Four courses (12 credits) in 300- or 400- level history courses

Three courses (9 credits) in a region or topic

- Chosen from courses concentrated in a region or topic related, if possible, to the student’s major

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

In addition to meeting requirements for graduate study at Mason, applicants should hold a BA in art history or a minor in art history that includes two courses at the 400 level, or have an equivalent background. Candidates without the requisite background may be admitted provisionally. In addition to the application materials required for graduate study, applicants should submit the following:

- Résumé that clearly describes student’s background in art history or related fields
• Goals statement that explains student’s interest in art history graduate study
• Satisfactory scores on GRE (This requirement is waived for students who received their undergraduate degree 10 or more years ago, or hold another graduate degree.)
• Writing sample
• Two letters of recommendation from art history professors or others closely associated with the candidate’s preprofessional activities

Degree Requirements

Students pursuing this degree must complete 30 graduate credits.

Three required courses (9 credits):

• ARTH 600 - Methods and Research in Art History Credits: 3
• ARTH 696 - Independent Directed Readings Credits: 3
• ARTH 699 - Topics in Art History Credits: 3

Five elective courses (15 credits) in ARTH and HIST

• Electives from AVT, ANTH, or CULT may be used, with prior written permission of the graduate director

One course (3 credits) of applied preprofessional learning chosen from:

• ARTH 593 - Art History Internships Credits: 3-6
• ARTH 594 - The Museum Credits: 3

One course (3 credits) in technology and new media for preparation for the comprehensive exam chosen from:

• 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

• Demonstration of reading ability in one relevant research language, to be approved by the graduate director

Written comprehensive exam

• Students may retake the exam once, following the original procedures. The second exam must be taken within one calendar year.

History, MA
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 must fulfill admission requirements for graduate study and the Department of History and Art History. These requirements include satisfactory scores on the GRE and two letters of recommendation from history professors with whom the applicant has studied or others directly familiar with the applicant’s professional competence and interests.

The GRE requirement is waived for students who received their undergraduate degrees 10 or more years ago or hold another graduate degree.

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 sixth 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 deficiencies 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 one of the thematic courses 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.

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:

- 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

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.

▲ 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

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.

▲ 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 can choose from 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

▲ 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):
  o Origins to 1861
  o 1861–1914
  o 1914 World War I to the present
• Specialization in European history (at least 3 credits from each group):
  o Ancient, medieval, early modern to 1789
  o 1789–1914
  o 1914 to the present
• Specialization in world history (at least 3 credits from two regions):
  o Africa
  o Asia
  o Middle East
  o 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

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

▲ 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)

Students may optionally do a thesis HIST 799 (6 credits). Students who choose this option complete only 6 credits of electives.

▲ 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:

- HIST 610 - The Study and Writing of History Credits: 3

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

Doctoral Degree

History, PhD

Banner Code: LA-PHD-HIST

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

In addition to meeting all admission requirements for graduate study, applicants should submit the following:

- Three letters of recommendation from professional colleagues or academic mentors
• GRE score
• Goals statement that explains the applicant’s academic credentials, professional background, intellectual interest in the doctoral program in history, and ultimate career goals
• Writing sample consisting of a history essay, research paper, or professional paper

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 (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
• 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):

• Chosen from courses in U.S. history, European history, comparative world history

Minor fields (18 credits):

• Chosen from courses in two minor fields (9 credits each)

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 statement for each minor field and an oral exam for the major field.

Dissertation:

• HIST 998 - Doctoral Dissertation Proposal Credits: 1-6 (3 credits minimum; 6 credits maximum)
• HIST 999 - Doctoral Dissertation Research Credits: 1-12 (15 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 field statements 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.

Continuous Registration

Once enrolled in 998, students must maintain continuous registration in 998 or 999 each semester until the dissertation is submitted to and accepted by University Libraries.

■ Honors Program in General Education

Phone: 703-993-1110
Web: honors.gmu.edu

Faculty

Albanese, Alligood (associate director), Bakhash, Bristol, Burr (director), Burt, Butler, Carbonneau, Carton, J. R. Censer, Cherubin, Constantine, Dakake, D’Andrea, DeCaroli, Deshmukh, Diecchio, Fox, Geller, Gifford, Gould, Granfield, Haines, Harbour, Heelo, Hodges, M. Holt, Jacobs, Jann, Johnsen-Neshati, Jones, Karush, Koch, Kulesza, Leeman, Maloney, Mandaville, Mandes, Mattusch, McFerson, Metcalf, L. Miller, Nadeau, Nichols, J. Paden, Palkovich, Ramos-Pellicia, Roan, Roman-Mendoza, Reid, Rutledge, Sachs, Sample, Samuelian, Seligmann, Shutika, V. Smith, C. Snyder-Hall, Stearns, Taciuch, Tangney, Taylor, Todd, Trefil, T. Williams, B. Wilson, Yadav, Zaccaro, Zagarri

Course Work

The program offers all course work designated HNRS 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 track in science, technology, engineering, economics, and mathematics offers honors sections of first-year courses in these disciplines, as well.

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. Students apply to the Honors Program when applying to Mason by selecting the box that indicates they are interested in the Honors Program and by completing an additional essay question. If the application meets the criteria for admission to the Honors Program, the applicant will receive an invitation to the program shortly after receiving the acceptance letter to the university.

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 certain HNRS courses, excluding HNRS 110 and HRNS 353.

Requirements

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. Students then have a choice of two tracks, determined by their majors and degrees. The STEM track is designed for students pursuing a bachelor of science degree in science, technology, engineering, economics, or mathematics. The Liberal Arts and Social Sciences (LASS) track is for students pursuing a bachelor of arts degree, who have additional college level requirements.

To receive honors in general education on their transcript, students must earn a minimum GPA of 3.00 in HNRS courses and 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.

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 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) degree provides an alternative to the traditional baccalaureate, offering 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 BIS 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.

There are two pathways for obtaining this degree. Students can design their own individualized interdisciplinary program of study or pursue a standardized concentration. These alternatives require different course work, prerequisites, and eligibility.

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. The concentration in early childhood education studies is an exception to the seven-year time limit.

Application and Admission

Students interested in the BIS program must attend an information session and apply separately to the BIS Program in addition to applying to Mason through the Office of Admissions. The BIS information session schedule and application form are available on line at www.bis.gmu.edu. Admission is selective and based on a minimum GPA of 2.50 on previous course work.

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). Students accepted to the honors in the major must complete a BIS 391 and BIS 490 (an individualized section) with a minimum GPA of 3.5, maintain a cumulative GPA of 3.75 or higher, and successfully present their research during the Senior Capstone Project presentations.

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. For an approved list, go to admissions.gmu.edu/exams/ExamCLEP.asp (45 maximum credits).
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 (45 maximum credits) and be approved for Mason credit. The specific credits must also be approved by the program director and the dean. Note: Total combined credit for exams and ACE-approved training cannot exceed 60 credits. For example, if 45 credits are accepted by ACE-approved training, a maximum of 15 credits can be accepted for the exam.
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).

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 BIS degree, not all university and program requirements can be fulfilled in these ways. These nontraditional credits are not transferable to other degree programs at Mason.

Bachelor’s/Accelerated Master’s Program

The program offers highly qualified undergraduates the opportunity to apply to an accelerated master’s degree program in telecommunications. 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

Students pursing a bachelor's degree in individualized study must meet the baccalaureate degree requirements for all undergraduates: they need to complete a minimum of 120 credits of course work, complete 45 credits in courses above the 300 level, take at least 30 credits at Mason, and complete general education requirements.

Students in the BIS program are required to meet a modified general education program of 36 credits: 6 credits in English composition (ENG 101 and ENG 302), 9 credits in humanities, 9 credits in social sciences, 3 credits in MATH or STAT (MATH 106 or STAT 250), 3 credits in IT-designated course work, 3 credits in a lab or non-lab natural science, and 3 credits in synthesis (BIS 490).
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.

Degree Requirements

Students pursuing a BIS degree must complete four required courses and one of the concentrations below. Concentrations consist of 24-39 credits. At least 24 credits applied to the concentration must be at the 300 level or above. Students must have a minimum GPA of 2.00 in courses applied to the concentration. No more than six credits of C- or D grades may be applied to the concentration.

Courses applied to a concentration may not also be used to fulfill general education requirements.

Students are encouraged to pursue a minor. 15 credits of the minor must be applied uniquely to the minor and not to the BIS concentration.

Four required courses (10 credits) with a minimum grade of 2.00:

To enroll to enroll in BIS 490, students must have an approved BIS 390 project proposal. In BIS 490, students complete a senior capstone project that varies according to the individual program of study. It may be a research or creative project, and it must be appropriate to the student’s interdisciplinary concentration. BIS 490 requires significant writing and fulfills the synthesis requirement. The project is evaluated by the BIS 490 instructor in consultation with the student’s faculty mentor and usually one other faculty member or qualified professional. BIS 490 and BIS 491 are taken concurrently when no more than 6 credits remain in the concentration.

- BIS 300 - Understanding Multidisciplinary Studies Credits: 3
- BIS 390 - The Research Process Credits: 3
  or
- BIS 391 - The Research Process for Honors Credits: 3
- BIS 490 - Senior Project Credits: 3
- BIS 491 - Senior Project Presentation Credits: 1

Choose from one of the following concentrations:

Concentration Requirements

▲ BIS Individualized Concentration (IND)

Students may choose to 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 and nontraditional credit from other institutions. The concentration consists of between 24 and 36 credits depending on the topic and the student's preparation. In addition to meeting the requirements for all concentrations above, 25 credits applied to this concentration must be completed at Mason.
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.

Notes:

Students must have an approved BIS 390 project proposal 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 a research or creative project, and it must be appropriate to the student’s interdisciplinary concentration. BIS 490 requires significant writing and fulfills the synthesis requirement. The project is evaluated by the BIS 490 instructor in consultation with the student’s faculty mentor and usually one other faculty member or qualified professional. BIS 490 and BIS 491 are taken when no more than 6 credits remain in the concentration. Students must receive a grade of 2.00 or better in all BIS Core classes.

Total: 24-36 credits

▲ BIS Concentration in Business Communications (BCO)

This concentration provides an interdisciplinary foundation for students who want to pursue a variety of business and/or communication-related careers. Drawing from course work in management, psychology, communication, and English, students learn about communication in the workplace from multiple perspectives.

Five courses (15 credits) of communication:

- COMM 305 - Foundations of Intercultural Communication Credits: 3
  or
- COMM 332 - Nonverbal Communication Credits: 3
- COMM 320 - Business and Professional Communication Credits: 3
- COMM 330 - Principles of Public Relations Credits: 3
  or
- COMM 389 - Public Relations for Associations and Nonprofits Credits: 3
- COMM 335 - Organizational Communication Credits: 3
- COMM 401 - Interpersonal Communication in the Workplace Credits: 3
  or
- COMM 434 - Interviewing Credits: 3

Three courses (9 credits) in business:
• 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

Two courses (6 credits) of other interdisciplinary coursework:

• ENGL 410 - Professional and Technical Writing Credits: 3
• PSYC 467 - The Psychology of Working in Groups and Teams Credits: 3
  or
• SOCI 304 - Sociology of Work and Occupations Credits: 3

Total: 30 credits

▲ BIS Concentration in Educational Psychology (EDP)

This concentration provides an interdisciplinary foundation for students who want to go into educational careers, including administrative, instructional, and counseling roles across the K–12 spectrum. Drawing from psychology and education course work, students in this concentration learn about the psychology of learning, including cognitive processes across developmental stages and educational strategies through which individuals better comprehend and internalize knowledge.

Five education courses (15 credits):

• EDUC 301 - Educationally Diverse Populations: Handicapped, Gifted, Multicultural Credits: 3
• EDUC 302 - Human Growth and Development Credits: 3
• EDUC 422 - Foundations of Secondary Education Credits: 3
• EDUT 411 - Developmental Pathways of Diverse Learners, Birth-Adolescence Credits: 3
• EDUT 413 - Foundations of Language and Literacy for Diverse Learners Credits: 3
  or
• EDUT 414 - Curriculum and Instruction for Diverse Learners, Ages 3-5 Credits: 3

Five courses (15 credits) of psychology:

• PSYC 211 - Developmental Psychology Credits: 3
• PSYC 313 - Child Psychology Credits: 3
• PSYC 309 - Sensation, Perception, and Information Processing Credits: 4
or
- PSYC 317 - Cognitive Psychology Credits: 3
- PSYC 314 - Adolescent Psychology Credits: 3
  or
- NCLC 312 - Images and Experiences of Childhood: Social Construct, Literature, and Film Credits: 3-15
- PSYC 321 - Counseling Psychology Credits: 3
  or
- PSYC 325 - Abnormal Psychology Credits: 3

Total: 30 credits

▲ BIS 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. Students must complete 49 credits with a minimum GPA of 2.00.

Admission Requirements

Admission to this concentration requires a separate application to the program after admission to the university. Students are guaranteed admission to Mason and the BIS program if they have achieved the GPA stipulated in the Mason/NVCC general articulation agreement (currently 2.75) and completed all requirements for an associate’s degree in applied science in early childhood development. Unlike the individualized program, there is no restriction regarding years since high school graduation for admission into the BIS in early childhood education.

24 credits of interdisciplinary courses:

In addition to the courses below, students complete this requirement with electives chosen in consultation with the director.

- EDUC 302 - Human Growth and Development Credits: 3
- SOCI 303 - Sociological Research Methodology Credits: 4
  or
- GOVT 300 - Research Methods and Analysis Credits: 4
- Take 8 credits of NCLC 312 - Images and Experiences of Childhood: Social Construct, Literature, and Film Credits: 3-15
- PSYC 313 - Child Psychology Credits: 3
- EDUT 413 - Foundations of Language and Literacy for Diverse Learners Credits: 3
  or
- EDUT 414 - Curriculum and Instruction for Diverse Learners, Ages 3-5 Credits: 3
- EDUT 423 - Language Acquisition and Communication for Diverse Infants and Toddlers Credits: 3
or

- EDUT 424 - Culturally, Linguistically, and Developmentally Appropriate Practices with Infants, Toddlers, and their Families Credits: 3

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

Total: 39 credits

▲ BIS Concentration in Human Resources and Organizational Studies (HROS)

This concentration provides an interdisciplinary foundation for students who want to pursue careers in employee relations, human resources management, and organizational development. Drawing from course work in sociology, management, psychology, and communication, students learn theories on employee and organizational behavior from multiple perspectives as well as ethical and best practices in the field.

33-34 credits of interdisciplinary course work:

- MGMT 301 - Managing People and Organizations Credits: 3
- MGMT 321 - Introduction to Human Resource Management Credits: 3
- MGMT 413 - Organizational Development and Management Consulting Credits: 3
- MGMT 421 - Advanced Human Resource Management Credits: 3
- MGMT 431 - Employee Relations Credits: 3
- PSYC 320 - Psychological Tests and Measurements Credits: 4
  or
- PSYC 330 - Psychology of Adjustment Credits: 3
  or
- PSYC 333 - Industrial and Organizational Psychology Credits: 3
  or
- PSYC 435 - Personnel Training and Development: A Psychological Perspective Credits: 3
- SOCI 304 - Sociology of Work and Occupations Credits: 3
- COMM 320 - Business and Professional Communication Credits: 3
  or
• COMM 335 - Organizational Communication Credits: 3
• NCLC 305 - Conflict Resolution and Transformation Credits: 6
• SOM 301 - Business Models: A Learning by Writing Introduction Credits: 3
  or
• ENGL 410 - Professional and Technical Writing Credits: 3

Total: 33-34 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 BIS may fulfill this requirement by successfully completing BIS 390/391. Students must have an approved BIS concentration and a grade of 2.00 or better in ENGL 302 before enrolling in BIS 390/391.

Bachelor's/Accelerated Master's Program

Individualized Study, BIS/Telecommunications, Accelerated MS

Students who are in the Bachelor of Individualized Study (BIS) Program may elect to enter an 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. The 6 undergraduate credits must be selected from those given in the table that follows 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 concentration courses.

Applicants must be Mason undergraduate students in the BIS Program. Students may apply for the accelerated program during the semester after which they will have completed 90 or more credits and 15 Mason resident credits applicable toward the BIS as an undergraduate. 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.

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. The MS in TCOM is granted on completion of all requirements for the accelerated degree.

TCOM courses that may be taken by a BIS undergraduate student as part of the accelerated program are given in the table below. **Note:** All of the prerequisite courses indicated below must be passed with a grade of B or higher.
Degree Requirements

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

- Additional 500-level TCOM course (3)
- Plus an additional 9 to 21 credits to reach required number.
- BIS 300 - Understanding Multidisciplinary 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 Minors and Certificate (CHSS)
The College of Humanities and Social Sciences offers many minors and one certificate in interdisciplinary areas of study. These minors require course work from two or more disciplines and are administered by interdepartmental faculty groups, often faculty from across the university.

Other interdisciplinary minors are offered by departments and programs in the college. These include:

- African and African American Studies
- Global Affairs
- Judaic Studies
- Japanese Studies
- Latin American Studies
- Leadership
- Nonprofit Studies
- Women and Gender Studies

For policies governing all minors, see the Academic Policies chapter of the catalog.

**Bachelor's Level Certificate**

**Islamic Studies Undergraduate Certificate**

**Banner Code: LA-CERB-ISLM**

The certificate is for those seeking academic or professional enhancement through basic knowledge about Islam. Students may not earn both a minor and a certificate in Islamic Studies.

This program of study is offered by the College of Humanities and Social Sciences.

For policies governing all certificates, see the Academic Policies chapter of the catalog.

**Certificate Requirements**

Students pursuing this certificate complete 24 credits.

**Three core courses (9 credits):**

- GOVT 345 - Political Islam Credits: 3
- HIST 281 - Survey of Middle Eastern Civilization Credits: 3
- RELI 272 - Islamic Religious Life Credits: 3

**Four elective courses (12 credits) chosen from:**

- 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
FREN 453 - Francophone Literature from North Africa Credits: 3
GEOG 325 - Geography of North Africa and the Middle East Credits: 3
GEOG 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
HIST 282 - Survey of Middle Eastern Civilization 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

Foreign language requirement (3 credits)

One course in a foreign language of any country with a significant Muslim population. While Arabic maybe used to fulfill this requirement, other languages can be substituted with prior approval of the coordinator.

Notes:

Students may have the foreign language requirement waived if they can demonstrate proficiency in a relevant foreign language. They may do this through an exam offered by the Department of Modern and Classical Languages or through presentation of the relevant documentation to the Office of Undergraduate Academic Affairs. Such students will have 3 additional elective credits. Courses in another language of the Islamic world can also be applied toward elective credits.

Special topics courses, when relevant, may be used to fulfill elective credits for the minor with prior written approval of the coordinator.

Total: 24 credits

Undergraduate Interdisciplinary Minor

Ancient Mediterranean Art and Archaeology Minor

Banner Code: ARTM

Phone: 703-993-3770

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 archeology, literature, art, history, philosophy, myth, and religion. The minor’s scope 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 archeology. 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 coordinator in designing a program. At least 3 credits must be taken in ARTH, and at least 9 credits must be taken outside of ARTH.

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, distributed as follows:

Preparatory work:

- GREE 150 - Classical Greek I Credits: 3
- GREE 160 - Classical Greek II Credits: 3

or one course (3 credits) in ancient literature chosen from:

- 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 Near (Middle) East Credits: 3

or at least one course (3 credits) of Greek, Latin, or a modern research language in addition to the basic two-year introductory language sequence

Two to three elective courses (6 to 9 credits) chosen from:

- 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
- ARTH 399 - Special Topics in the History of Art Credits: 3 (with approval of the coordinator)
- 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 351 - Religions of the Ancient Near East Credits: 3
- RELI 352 - Judaism from Exile to Talmud Credits: 3
- RELI 381 - Beginnings of Christianity Credits: 3

Note:

Any courses pertaining to the region and period may be used to fulfill this requirement with the prior written approval of the coordinator.

Seminar (3 credits) chosen from:

- ARTH 420 - Advanced Studies in Ancient Art Credits: 3 (if topic is appropriate)
- ARTH 430 - Advanced Studies in Medieval or Islamic Art Credits: 3 (if topic is appropriate)

Practicum (3 to 6 credits) chosen from:

- ARTH 394 - The Museum Credits: 3
  or
- ARTH 594 - The Museum Credits: 3
- ANTH 322 - Historical Archaeology Credits: 3
- ANTH 325 - Field Techniques in Archaeology Credits: 3-6
- ANTH 420 - Interpretation in Archaeology Credits: 3
- ANTH 430 - Research Methods in Archaeology Credits: 3

Note:

Archaeological field work done for credit or an appropriate ARTH 393 internship may be used to fulfill this requirement with the prior written approval of the coordinator.

Total: 18 credits

Applied Conservation Studies Minor

Banner Code: CONS

The minor in applied conservation studies is designed for students who wish to augment their academic programs with conservation studies taught in an experiential manner. Grounded in natural science, these interdisciplinary courses combine public policy, sociology, conflict resolution, and global awareness. Students work with Smithsonian researchers and Mason...
faculty at the Smithsonian’s Conservation Research Center in Front Royal, VA -- a facility that houses some of the world’s most endangered species.

Students may pursue this minor only as a part of the Smithsonian Mason Semester. It is offered jointly by the College of Humanities and Social Sciences and the Department of Environmental Science and Policy in the College of Science.

For policies governing all minors, see the Academic Policies chapter of this catalog.

Course Work

Students receiving this minor complete 16 credits as distributed below, with a minimum grade of 2.00 in each course.

Five required courses (16 credits):

- CONS 320 - Conservation in Practice Credits: 3
- CONS 401 - Conservation Science I: Conservation Theory Credits: 3
- CONS 402 - Conservation Science II: Conservation Practice Credits: 4
- CONS 410 - Human Dimensions in Conservation Credits: 3
- CONS 490 - Integrated Conservation Strategies Credits: 3

Total: 16 credits

Asia-Pacific Studies Minor

Banner Code: APS

Phone: 703-993-2957

Faculty

Butler, Chang, Cuong, DeCaroli, Hinton, H. Nguyen (coordinator), Lin, Paden, Platt, 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. In particular, a new type of trans regionalism is explored: the links between Asia and North America.

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 a minimum of 18 credits, distributed as follows:

Two required courses (6 credits) chosen from:
• Any single 200-level or higher course in an Asian language

• 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 the Orient Credits: 3

Four elective courses (12 credits), chosen from:

• Any course from the list of required course options not used to fulfill the requirement
• 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 - The Buddhist Tradition Credits: 3
• RELI 337 - Mysticism: East and West Credits: 3

Note:

Special topics courses, study abroad courses, or internships, when relevant, may be used to fulfill this requirement with the prior written approval of the coordinator. Language courses in Chinese, Korean, or Japanese are strongly recommended.

Total: 18 credits

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

The Film and Media Studies (FAMS) interdisciplinary minor 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
interdisciplinarity, 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.

Communication majors must choose at least 6 credits outside of communication for their FAMS elective courses.

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 distributed as follows:

Two required courses (6 credits):

- ENGL 332 - Introduction to Film Credits: 3
- COMM 380 - Media Criticism Credits: 3

Four electives (12 credits) chosen from:

- 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 365 - Women and Media Credits: 3
- COMM 366 - Visual Communication Credits: 3
- COMM 452 - Media Production Practicum Credits: 3
- COMM 456 - Comparative Mass Media Credits: 3
- ENGL 327 - Introduction to Cultural Studies Credits: 3
- ENGL 331 - Introduction to Documentary Credits: 3
- ENGL 334 - Literary Approaches to Popular Culture Credits: 3
- ENGL 338 - Cultural Constructions of Sexualities Credits: 3
- ENGL 421 - Topics in Film History Credits: 3
- ENGL 422 - Topics in Film Theory Credits: 3
- ENGL 490 - Special Topics in Film Credits: 3
- ENGL 493 - Special Topics in Popular Literature Credits: 3
- ENGL 499 - Independent Study Credits: 1-3
- FREN 470 - Topics in French Cinema Credits: 3
- JAPA 320 - Japanese Cinema Credits: 3
- RUSS 470 - Topics in (Post) Soviet Film Credits: 3
Note:

ENGL 327, 334, 338, 493, and 499 require prior written approval of FAMS coordinator
ENGL 421, 422, and 490 may be repeated if topic is different
FREN 470 requires permission of instructor and approval of FAMS coordinator

Total: 18 credits

Folklore and Mythology Minor

Banner Code: FOLK
Phone: 703-993-1172
Web: folklore.gmu.edu

Faculty

Burns, Decaroli, ffolliott, Fuchs, Johnsen-Neshati, Mattusch (co-coordinator), Owens, Rutledge, Shiner, Shutika, Todd, Winkler, Yocom (co-coordinator)

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. If one of these courses is used to fulfill the 3 credits of literature required for general education, it may not be used to fulfill a requirement for the minor.

One course (3 credits) chosen from:

- ARTH 102 - Symbols and Stories in Art Credits: 3
- CLAS 250 - Classical Mythology Credits: 3
- RELI 100 - The Human Religious Experience Credits: 3
- RELI 211 - Religions of the Near (Middle) East Credits: 3
- RELI 212 - Religions of the Orient 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
- CLAS 340 - Greek and Roman Epic Credits: 3
- CLAS 350 - Greek and Roman Tragedy Credits: 3
- ENGL 311 - Writing Ethnography Credits: 3
- ENGL 333 - Folklore of the Americas Credits: 3
- ENGL 337 - Special Topics in Myth and Literature Credits: 3
- ENGL 491 - Special Topics in Folklore Credits: 3
- ENGL 498 - Internship: Special Topics Credits: 1-3
- ENGL 591 - Special Topics in Folklore Credits: 3
- RELI 351 - Religions of the Ancient Near East Credits: 3
- RELI 401 - Death and the Afterlife in World Religions Credits: 3
- RELI 408 - Ritual and Drama in Global Religions Credits: 3

Independent study and internships (0 to 3 credits) chosen from:

- Summer field work schools offered by the American Folklife Center at the Library of Congress and other institutions approved by faculty
- ANTH 299 - Independent Study Credits: 1-3
- ANTH 495 - Internship Credits: 3-6
- 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
- ENGL 498 - Internship: Special Topics Credits: 1-3
- ENGL 499 - Independent Study Credits: 1-3

Total: 18 credits

Note:

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.
Global Systems Minor

Banner Code: GLOS

Phone: 703-993-1400

Faculty

Harbour (coordinator)

The minor consists of 18 credits of non-region-specific courses that deal with global connections or transactions. It is ideal for majors in business disciplines, economics, languages, geography, government and international politics, history, and other disciplines that take a global view. At least 9 credits must be at the 300 level or above.

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 distributed as follows:

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:

Field A: Government, geography, and administration of justice:

- ADJ 405 - Law and Justice around the World Credits: 3
- GEOG 101 - Major World Regions Credits: 3
- GEOG 301 - Political Geography Credits: 3
- GEOG 303 - Conservation of Resources and Environment Credits: 3
- GEOG 304 - Geography of Population Credits: 3
- GEOG 305 - Economic Geography Credits: 3
- GOVT 132 - Introduction to International Politics Credits: 3
- GOVT 349 - Issues in the Analysis of Global Systems Credits: 1-3
- GOVT 444 - Issues in International Studies Credits: 1-3
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 333 - Humanitarian Action Credits: 3
- ANTH 375 - Anthropological Perspectives on 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 - Sociology of Urban Communities Credits: 3

Field C: Environmental science, global health, systems engineering, urban and suburban studies, civil and infrastructure engineering

- BIOL 307 - Ecology Credits: 4
- BIOL 377 - Applied Ecology Credits: 3
- CEIE 100 - Environmental Engineering around the World Credits: 3
- CEIE 450 - Environmental Engineering Systems Credits: 3
- CEIE 456 - Environmental Law Credits: 3
- GCH 543 - Global Health: Trends and Policies 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
- COMM 656 - Global Communication 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

Immigration Studies Minor
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 take 15 credits with a minimum GPA of 2.00, distributed as follows:

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 - Racial and Ethnic Relations Credits: 3
- HIST 418 - Ethnic Groups in America Credits: 3
- ENGL 375 - Ethnic American Literature Credits: 3
- ENGL 479 - Ethnicity and Immigration 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 - Identity Conflicts and their Resolution Credits: 3

Two elective courses (6 credits) chosen from:

- FRLN 385 - Multilingualism, Identity, and Power Credits: 3
- NCLC 361 - Neighborhood, Community, and Identity Credits: 3-15
- SOCI 332 - Sociology of Urban Communities Credits: 3
- SPAN 430 - Spanish in the United States Credits: 3
Islamic Studies Minor

Banner Code: ISLM

Phone: 703-993-1261

Faculty

Amireh, Bakhash, Butler, Dakake, DeCaroli, Hamdani (coordinator), Hilmi, Katz, Lukacs, Mandaville, Paden, Sheers

The minor in Islamic studies is designed for students interested in the societies, culture, history, and politics of the Islamic world. It is available to currently enrolled undergraduates.

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 complete 21 credits, distributed as follows:

Three core courses (9 credits):

- GOVT 345 - Political Islam Credits: 3
- HIST 281 - Survey of Middle Eastern Civilization Credits: 3
- RELI 272 - Islamic Religious Life Credits: 3

Three elective courses (9 credits) chosen from:

- 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
- FREN 453 - Francophone Literature from North Africa Credits: 3
- GEOG 325 - Geography of North Africa and the Middle East Credits: 3
- GEOG 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
- HIST 282 - Survey of Middle Eastern Civilization 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

Note:

Special topics courses, when relevant, may be used to fulfill elective credits for the minor with prior written approval of the coordinator.

Foreign language requirement (3 credits)

• One course in a foreign language of any country with a significant Muslim population. While Arabic may be used to fulfill this requirement, other languages can be substituted with prior approval of the coordinator. Students may have this requirement waived by demonstrating proficiency in a relevant foreign language as determined by the Department of Modern and Classical Languages. Students who waive this requirement must complete 3 additional elective credits. Courses in another language of the Islamic world can also be applied toward elective credits.

Total: 21 credits

Linguistics Minor

Banner Code: LING

Phone: 703-993-1188
Web: linguistics.gmu.edu

Faculty

Chamberlain, Goldin, Holisky, Jones, Leeman, Levine, McCarthy, Ramos-Pellicia, Roman-Mendoza, Weinberger (coordinator), 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

Students pursuing this minor must complete 15 credits, distributed as follows.
One course (3 credits) in general linguistics

One course (3 credits) from syntactic theory, phonological theory, or linguistic semantics

Three elective courses (9 credits)
  • Chosen in consultation with the linguistics director

Total: 15 credits

Middle East Studies Minor

Banner Code: MES

Phone: 703-993-2926
Web: mes.gmu.edu

Faculty

Amireh, Bakhash, Bryant, Butler, Gopin, Haddad (director), Hamdani, Hilmi, Katz, Lukacs, Mandaville, Massi-Dakake, Paczynska, Rouhana

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. It is available for enrolled Mason students.

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, distributed as follows:

Three core courses (9 credits):
  • HIST 282 - Survey of Middle Eastern Civilization Credits: 3
  • GOVT 332 - Government and Politics of the Middle East and North Africa Credits: 3
  • ENGL 349 - Global Voices Credits: 3
    or
  • ANTH 330 - Peoples and Cultures of Selected Regions: Non-Western Credits: 3
Three elective courses (9 credits) chosen from:

- GOVT 345 - Political Islam Credits: 3
- HIST 281 - Survey of Middle Eastern Civilization Credits: 3
- HIST 462 - Women in Islamic Society 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
- HIST 387 - Topics in Global History Credits: 3
- ANTH 399 - Issues in Anthropology Credits: 3
- RELI 211 - Religions of the Near (Middle) East Credits: 3
- RELI 272 - Islamic Religious Life Credits: 3
- RELI 374 - Islamic Thought Credits: 3
- RELI 375 - Qur'an and Hadith Credits: 3
- ARTH 319 - Art and Archaeology of the Ancient Near East Credits: 3
- ARTH 320 - Art of the Islamic World Credits: 3
- GEOG 325 - Geography of North Africa and the Middle East Credits: 3
- ARAB 325 - Major Arab Writers/Stories Credits: 3
- ARAB 330 - Reading and Conversation I Credits: 3
- ARAB 331 - Reading and Conversation II Credits: 3

Note:

Other courses, when relevant, may be used to fulfill this requirement with the prior written approval of the director of the program.

Only one of the following courses may count as an elective:

- GOVT 328 - Non-Western Political Theory Credits: 3
- GOVT 447 - Revolution and International Politics Credits: 3
- CONF 399 - Special Topics in Conflict Analysis and Resolution Credits: 3
- CONF 340 - Global Conflict Analysis and Resolution Credits: 3

Note:

Only one elementary or intermediate language course may count as an elective (relevant languages: Arabic, Hebrew, Farsi, Turkish). Students are strongly encouraged to sign up for one of the study tour courses on the Middle East offered by the Study Abroad Program at the Center for Global Education. Destinations include Egypt, Israel, Palestine, Syria, Lebanon, Turkey, Yemen, Morocco, Jordan, and the United Arab Emirates.

Total: 18 credits
Multimedia Minor

Banner Code: MM

Phone: 703-993-4318

Faculty

Cambridge (co-coordinator), Chung, Forche, Higgins, Lont, Martin, O’Connor, L. Smith (co-coordinator), 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 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 to 20 credits.

Core courses (8-10 credits):

- AVT 104 - Studio Fundamentals I Credits: 4
- COMM 157 - Video Workshop Credits: 1
  or
- NCLC 195 - Field-Based Work Credits: 1-15 (1 credit) (Students may not enroll in COMM 157 if they have already completed COMM 355.)

and one course chosen from:

- AVT 180 - Computers in the Creative Arts Credits: 3
- CHSS 101 - Presenting and Processing Information Using Technology Credits: 1-3
- NCLC 249 - The Internet: Literacy, HTML Tools, and Virtual Community Credits: 3-15

Elective courses (8-10 credits)

No more than six credits can be taken in any one college or department.
Native American and Indigenous Studies Minor

Banner Code: NAIS

Phone: 703-993-1161

Faculty

Anderson (coordinator), Benitez, Bullard, Moore, Scully, Snead, Tichy, Yocom

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 will take five 3-credit elective courses from no fewer than three departments. The course work for this minor will enable 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

Students pursuing this minor must complete 18 credits distributed as follows:

One required course (3 credits):

- NAIS 201 - Introduction to Native American and Indigenous Studies Credits: 3

Five elective courses (15 credits), chosen from:

- 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
- ENGL 311 - Writing Ethnography Credits: 3
- ENGL 333 - Folklore of the Americas Credits: 3
- HIST 340 - History of American Racial Thought Credits: 3
- HIST 391 - History of Virginia to 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
- HIST 418 - Ethnic Groups in America Credits: 3
- MUSI 103 - Musics of the World Credits: 3
- SOCI 308 - Racial and Ethnic Relations Credits: 3

Notes:

Special topics courses and summer field work offerings, when relevant, may be used to fulfill elective credits for the minor with prior approval of the coordinator.

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. A minimum GPA of 2.00 is required for course work in this minor.

Total: 18 credits

New Europe Minor

Banner Code: NEU

Phone: 703-993-4973

Coordinator
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 a minimum of 18 credits. Where relevant to the minor, special topics courses, seminars, independent study, internships, and study abroad may also be taken for elective credit, with prior approval by the coordinator.

One required course (3 credits) chosen from:

- GOVT 334 - Government and Politics of Europe Credits: 3
- GOVT 444 - Issues in International Studies Credits: 1-3 (With prior approval of the coordinator)

Five elective courses (15 credits), at least one from each field:

Field A: History, geography, and politics

- GEOG 320 - Geography of Europe Credits: 3
- GOVT 334 - Government and Politics of Europe Credits: 3 (if not taken as the required course)
- GOVT 337 - Ethnic Politics in Western Europe and North America Credits: 3
- GOVT 338 - Government and Politics of Russia 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

Field B: Language, literature, and the arts

- ARTH 362 - Twentieth-Century European Art Credits: 3
- FREN 441 - Twentieth-Century Prose Fiction Credits: 3
- FREN 442 - Twentieth-Century Drama and Poetry Credits: 3
- FREN 470 - Topics in French Cinema Credits: 3
- FREN 580 - Contemporary French Society and Culture Credits: 3
- GERM 451 - Modern Literature: 1925 to the Present Credits: 3
- PHIL 336 - Twentieth-Century Continental Thought: Existentialism Credits: 3
- SPAN 484 - The Literature of Spain II Credits: 3
- SPAN 580 - Contemporary Hispanic Institutions Credits: 3

Total: 18 credits
Political Philosophy Minor

Banner Code: PPHL

Phone: 703-993-1265

Faculty

Bergoffen, Cherubin, De Nys, Feit, Harbour, Mandaville, Miller, Paden (coordinator), Snyder-Hall

The minor provides intensive study in the area of political philosophy and political theory and includes courses that focus on 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. The minor provides the opportunity for students to study this field from a variety of interdisciplinary perspectives; develops a deeper philosophical perspective on political institutions; and lays the 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 distributed as follows:

Two core courses (6 credits) chosen from:

- PHIL 323 - Classical Western Political Theory Credits: 3
- GOVT 323 - Classical Western Political Theory Credits: 3
- PHIL 324 - Modern Western Political Theory Credits: 3
- GOVT 324 - Modern Western Political Theory Credits: 3
- PHIL 327 - Contemporary Western Political Theory Credits: 3
- GOVT 327 - Contemporary Western Political Theory Credits: 3

Three elective courses (9 credits) chosen from:

- PHIL 323 - Classical Western Political Theory Credits: 3
- GOVT 323 - Classical Western Political Theory Credits: 3
- PHIL 324 - Modern Western Political Theory Credits: 3
- GOVT 324 - Modern Western Political Theory Credits: 3
• GOVT 324 - Modern Western Political Theory Credits: 3
• PHIL 327 - Contemporary Western Political Theory Credits: 3
  or
• GOVT 327 - Contemporary Western Political Theory Credits: 3 (if not used to fulfill the core requirement)
• PHIL 427 - Feminist Political Thought Credits: 3
  or
• GOVT 427 - Feminist Political Thought Credits: 3
• PHIL 325 - Karl Marx's Social and Political Thought Credits: 3
• PHIL 429 - International Ethics 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

Note:

Special topics courses and independent studies courses, when relevant, may be used to fulfill elective credits with prior approval of the coordinator.

Total: 15 credits

Science and Society Minor

Banner Code: SCSO

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. In coordination with their minor advisor and through CHSS 200, students develop a core of five courses that revolves around a specific theme through which they connect science and society more closely. Possible themes include the environment, ethics, ethnography, faith, healing, justice and the law, media, and medicine, among others. The program of study must include one foundation course in the related field of study.

In addition to completing 15 credits of core courses, students start with CHSS 200 Introduction to Science and Society, which provides them with a broad overview of related topics and helps them to develop their individualized core of courses, and end
with a capstone CHSS 400 Perspectives on Science and Society, in which they demonstrate what they have learned through their
course of study.

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 a minimum of 18 credits distributed as follows:

Two required courses:

- CHSS 200 - Introduction to Science and Society Credits: 2
- CHSS 400 - Perspectives on Science and Society Credits: 1

Individualized core (15 credits)

Sample Individualized Cores

Science, Society, and Ethnography

- ANTH 135 - Becoming Human: Evolution, Cognition, and Culture Credits: 3 (foundation course)
- ANTH 365 - Race and Racism Credits: 3
- ENGL 311 - Writing Ethnography Credits: 3
- GEOG 304 - Geography of Population Credits: 3
- HIST 418 - Ethnic Groups in America Credits: 3

Science, Society, and Faith

- ANTH 135 - Becoming Human: Evolution, Cognition, and Culture Credits: 3 (foundation course)
- ANTH 496 - On Evolution Credits: 4
- PHIL 377 - Darwin: Biology and Beyond Credits: 3
- PHIL 378 - Reason, Science and Faith in the Modern Age Credits: 3
- RELI 100 - The Human Religious Experience Credits: 3 (foundation course)

Science, Society, and Humankind

- ANTH 120 - Introduction to Archaeology Credits: 3 (foundation course)
- BIOL 313 - Human Genetics for the Social Sciences Credits: 3
- ENGL 492 - Science Fiction Credits: 3
- PHIL 111 - Individual and Society Credits: 3
Science, Society, and the Environment

- ECON 335 - Environmental Economics Credits: 3
- EVPP 110 - The Ecosphere: An Introduction to Environmental Science I Credits: 4 (foundation course)
- GEOG 303 - Conservation of Resources and Environment Credits: 3
- PHIL 343 - Issues in Environmental Ethics Credits: 3

Note:

Only 9 lower-level credits can be applied to the minor (7 within the core and the 2-credit CHSS 200), and no more than 3 credits can be applied to both university general education requirements and the minor. No more than two courses from a single department can be applied to the minor. A minimum GPA of 2.00 is required for course work in this minor.

Total: 18 credits

Urban and Suburban Studies Minor

Banner Code: USSD

Phone: 703-993-1418

Faculty

Clapsaddle, Clark, Dumont, Gifford, Hackler (coordinator), Haynes, Horton, Hysom, Mattusch, Samara, Schintler, Schrag, Sockett, Stough, Todd, Travis, Verheyen, 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 a minimum of 18 credits, distributed as follows:

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)
- Chosen 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 coordinator for a list of approved courses in each category.

Total: 18 credits

■ Interdisciplinary Studies

Phone: 703-993-8762
Web: mais.gmu.edu

Executive Committee

Addleson, Burns, Hodzic, Kidd, Lont, Martin, O'Connor, Rodgers, Salmon, Shutika, Simmons, Snyder-Hall (director), Sorrell, Wood, Vitazkova, Yocom

Course Work

This program offers the courses designated MAIS in the Courses chapter of this catalog. However, students in the Master of Arts in Interdisciplinary Studies (MAIS) 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 for specialized and individualized graduate study. Students choose one of eight 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. Student complete their degrees with a project or thesis.

Concentrations

Students pursuing a master's degree program in interdisciplinary studies can choose a concentration in community college teaching or higher education, both sponsored by the Higher Education Program. They can do a concentration in folklore, sponsored by the faculty in English or one in religion, culture, and values, sponsored by Religious Studies. The video-based production concentration is sponsored by the Communication Department, while the concentration in women and gender studies is sponsored by the Women and Gender Studies Program and that in Zoo and Aquarium Leadership, by New Century College.

For a variety of reasons, traditional graduate programs are not able to meet the specific educational goals of some students. They can choose the individualized concentration. With the help of a faculty advisor, they design an individualized program of study that includes courses from several academic disciplines.

Master's Degree
Interdisciplinary Studies, MAIS

Banner Code: LA-MAIS-ISIN

This program 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.

MAIS offers the following structured interdisciplinary concentrations:

- Community college teaching (in communication, English, information systems, math, Spanish, or TESL)
- Folklore
- Global interaction
- Higher education (administration or student affairs)
- Religion, culture, and values
- Video-based production
- Women and gender studies
- Zoo and aquarium leadership

The MAIS also offers students the opportunity to design an individualized concentration to meet the special needs of their careers.

This program of study is offered by the Interdisciplinary Studies Program.

For policies governing all graduate degrees, see the Academic Policies chapter of the catalog.

Application Requirements

Students must show a capacity for original thought in cross disciplinary research. Applicants must meet Mason admission standards and application requirements for graduate study. See the Admission chapter of this catalog. Additional requirements vary by concentration. Students will be admitted only if the program can assign a faculty advisor appropriate for the intended course of study.

Degree Requirements

Students pursuing this degree must successfully complete 36 credits of graduate course work in one of the following concentrations. Students must submit a curriculum contract that has been approved by their faculty adviser and the MAIS director.

Courses applied to the MAIS degree are subject to these 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 (12 for students in the zoo and aquarium leadership concentration).

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 MAIS Program (which requires prior written approval of the MAIS program and the dean).

All students complete their work in the program with a project or thesis. Students admitted under this catalog are required to take MAIS 797 Proposal (1 credit) and either MAIS 798 Project (2–5 credits) or MAIS 799 Thesis (5 credits).
MAIS Concentration in Community College Teaching (CCT)

This concentration qualifies students to teach entry-level courses in rapidly growing fields at in community colleges. In addition, it is an appropriate graduate credential for some faculty currently teaching in community colleges.

Students pursuing this concentration must complete 36 credits of course work: 12 credits of courses in college teaching and 21 credits of graduate work in one of the following knowledge areas: communication, English, information systems, mathematics, Spanish, or teaching English as a second language (TESL). Students complete this concentration with a project.

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:

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 that are not use to meet 12 credit requirement.

English
Two to three core courses (6-9 credits):

- ENGL 701 - Research in English Studies Credits: 3
- ENGL 610 - Proseminar in Teaching the Reading of Literature Credits: 3
  and/or
- ENGL 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.

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.

Mathematics

Two core courses (6 credits):

- MATH 621 - Algebra I Credits: 3
- MATH 675 - Linear Analysis I 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.

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 electives (9 credits) must be graduate-level SPAN courses, one (3 credits) may be a graduate-level FRLN courses. Electives should be chosen in consultation with a faculty advisor.

Teaching English as a Second Language

Six core courses (18 credits):

- LING 520 - Descriptive 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 - Descriptive Aspects of English Phonetics and Phonology 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.

Proposal (1 credit):

- MAIS 797 - Interdisciplinary Studies Proposal Credits: 1

Project (2 credits):

- MAIS 798 - Individualized Studies Project Credits: 1-5
MAIS Concentration in Folklore (FLK)

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. This course of study prepares students for careers in cultural agencies, governmental organizations, and teaching institutions, and advanced study in the humanities.

Students choose a specialization that draws on unique programs throughout Mason, such as museum studies, conflict resolution, nonprofit management, telecommunications, and writing. Internships in the many Washington, D.C., metropolitan area folklore organizations are central to students’ experiences.

Students pursuing this concentration must successfully complete 36 credits of graduate course work with at least 6 credits taken in courses from outside the English Department.

Six core courses (18 credits):

Special topics in folklore (9 credits)

Courses may be repeated.

- ENGL 591 - Special Topics in Folklore Credits: 3
- ENGL 798 - Directed Reading and Research Credits: 1-3

Pathways in folklore scholarship (3 credits) chosen from:

- ENGL 591 - Special Topics in Folklore Credits: 3
- ENGL 798 - Directed Reading and Research Credits: 1-3

Internship in folklore (3 credits)

- ENGL 604 - Internship in Folklore Credits: 1-6

Research methodology course (3 credits) chosen from:

- ENGL 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 also can 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.

Proposal (1 credit):

- MAIS 797 - Interdisciplinary Studies Proposal Credits: 1

Project (2 credits) or thesis (5 credits):

- MAIS 798 - Individualized Studies Project Credits: 1-5
  or
- MAIS 799 - Individualized Studies Thesis Credits: 1-5

▲ MAIS Concentration in Global Interaction (GLOI)

This concentration in global interaction is not available on the Northern Virginia campuses. It is aimed at international students who wish to develop professional skills for functioning in English-language international settings, whether of business, government, education, or civil society. The curriculum provides a range of skills in such crucial areas as organizational structures, economic development, legal instruments, and multicultural communications. It does so with an emphasis on the language and topical skills that are basic to work and life in the global English-speaking community, which spans North America, Europe, Asia, and Africa. The program is explicitly interdisciplinary and multicultural, with an emphasis on course work and thesis development that will help position graduates in this broader global community.

Students pursuing this concentration must complete 36 credits.

Four core courses (12 credits):

- SOAN 500 - Communicating across the Disciplines Credits: 3
- GOVT 841 - Ethics and Human Rights in International Affairs Credits: 3
- PUAD 504 - Managing in the International Arena: Theory and Practice Credits: 3
- SOCI 804 - Sociology of Globalization Credits: 3
Three courses (9 credits) of specialization chosen from:

- ANTH 635 - Regional Ethnography Credits: 3
- ECON 676 - Comparative Economic Systems Credits: 3
- GEOG 525 - Economics of Human/Environment Interactions Credits: 3
- GOVT 631 - Seminar in Comparative Politics and Institutions Credits: 3
- GOVT 833 - European Union and Political Integration Credits: 3
- HAP 609 - Comparative International Health Systems Credits: 3
- PUAD 636 - The NGO: Policy and Management Credits: 1-3
- SOAN 510 - Culture and Globalization Credits: 3
- SOCI 633 - Special Topics in Sociology Credits: 3

Three elective courses (9 credits) chosen from:

- ANTH 617 - Political Economy Credits: 3
- ANTH 630 - Anthropology and Humanitarian Action Credits: 3
- ANTH 632 - International Migration in Comparative Perspective Credits: 3
- ANTH 640 - Applied Anthropology Credits: 3
- ANTH 655 - Nationalism, Transnationalism, and States: Local and Global Perspectives Credits: 3
- CONF 720 - Ethnic and Cultural Factors in Conflict Resolution Credits: 3
- CONF 728 - Human Rights Theory and Practice in Comparative Perspective Credits: 3
- ECON 825 - Political Economy and Public Policy I Credits: 3
- ECON 842 - Labor Economics Credits: 3
- EDLE 610 - Leading Schools and Communities Credits: 3
- EDLE 614 - Managing Financial and Human Resources Credits: 3
- GEOG 533 - Issues in Regional Geography Credits: 1-6
- GEOG 553 - Geographic Information Systems Credits: 3
- GCH 543 - Global Health: Trends and Policies Credits: 3
- GOVT 540 - International Relations Credits: 3
- GOVT 725 - Democratic Theory and Democratization Credits: 3
- HAP 542 - Health Policy Credits: 3
- HAP 621 - Management of Health Service Organizations Credits: 3
- ITRN 603 - International Trade Relations Credits: 3
- JLCP 702 - Comparative Justice Credits: 3
- JLCP 760 - Crime and Crime Policy Credits: 3
- PUAD 502 - Administration in Public and Nonprofit Organizations Credits: 3
- PUAD 640 - Public Policy Process Credits: 3
- PUAD 643 - Public Policy Research Credits: 3
- PUAD 660 - Public and Nonprofit Accounting and Finance Credits: 3
- PUBP 503 - Culture, Organization, and Technology Credits: 1-4
- PUBP 602 - Regional Economic Development: Strategies and Applications Credits: 3
- RELI 633 - Ethical Perspectives of World Religions Credits: 3
- SOAN 670 - Special Topics in Sociology and Anthropology Credits: 4-8
- SOCI 635 - Environment and Society Credits: 3
- SOCI 651 - Health Care Systems Credits: 3
Proposal (1 credit):

- MAIS 797 - Interdisciplinary Studies Proposal Credits: 1

Thesis (5 credits):

- MAIS 799 - Individualized Studies Thesis Credits: 1-5

Note:

Courses listed under specialization may also serve as electives subject to advisor approval.

▲ MAIS 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.

Students pursuing this concentration must complete 36 credits.

Four core courses (12 credits):

- Three courses (9 credits) chosen in consultation with advisor

One course (3 credits) chosen from:

- CTCH 621 - Higher Education in the United States Credits: 3
- CTCH 601 - The Community College Credits: 3

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 elective courses (9 credits) chosen in consultation with advisor

Practicum (3 credits):

- CTCH 685 - Practicum Credits: 3

Proposal (1 credit):

- MAIS 797 - Interdisciplinary Studies Proposal Credits: 1

Project or thesis (5 credits):

- MAIS 798 - Individualized Studies Project Credits: 1-5
  or
- MAIS 799 - Individualized Studies Thesis Credits: 1-5

▲ MAIS 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 faculty advisors, design unique programs of study that include 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 advisor and MAIS director during the first semester enrolled. Any subsequent amendments must have approval of the student advisor and the MAIS director.

Students pursuing this concentration must successfully complete 36 graduate credits.

Disciplinary focus (12 to 18 credits):

Students must complete 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 (2 credits) or thesis (5 credits):

- MAIS 798 - Individualized Studies Project Credits: 1-5
  or
- MAIS 799 - Individualized Studies Thesis Credits: 1-5

▲ MAIS Concentration in Religion, Culture, and Values (RCV)

This concentration is particularly applicable to, but not restricted to, 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. The Washington, D.C., metropolitan area is rich in the presence of many major religious traditions and their places of worship.

Students pursuing this concentration must complete a minimum of 36 credits.

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 641 - Drama in the World's Religions 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:

- COMM 605 - Intercultural Communication Credits: 3
- COMM 656 - Global 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):

Electives are chosen in consultation with the student’s advisor, bearing in mind the student’s specialization, project, or thesis topic. Any of the courses listed under the specializations listed above or courses from other disciplines listed below may be used as an elective.

- 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
- COMM 656 - Global 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
- ENGL 591 - Special Topics in Folklore 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 611 - Classical Sociological Theory Credits: 3
• SOCI 612 - Contemporary Sociological Theory 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 (2 credits) or thesis (5 credits):

• MAIS 798 - Individualized Studies Project Credits: 1-5
  or
• MAIS 799 - Individualized Studies Thesis Credits: 1-5

▲ MAIS Concentration in Video-Based Production (VBP)

The concentration emphasizes video production 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 linear editing.

Four academic units offer courses relevant to the concentration: Within the College of Humanities and Social Sciences, the Communication Department offers courses in the theory and practice of video production, and 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 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 COMM 590 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 videotape of their past work.

Students pursuing this concentration must complete graduate 36 credits.

One required introductory course (3 credits):

This requirement may be waived by the director for students with a video production background. They take an additional 3 credits of electives.

• COMM 590 - Seminar in Communication Credits: 3
  When the topic is video production.
Five required core courses (15 credits):

- THR 599 - Independent Study Credits: 1-6
  When the topic is scriptwriting.
  or
- EDIT 704 - Instructional Technology Foundations and Theories of Learning Credits: 3
- COMM 655 - Theories of Visual Communication in Telecommunications Credits: 3
  or
- ENGL 670 - Visual Culture: Theories and Histories Credits: 3
- COMM 697 - Independent Production Credits: 1-3
  Students need 3 credits.
- EDIT 611 - Innovations in Distance Learning Credits: 3
  or
- EDIT 750 - Emerging Educational Technologies Credits: 3
- COMM 694 - Communication Internship Credits: 3-6
  Students need 3 credits.

Three to five elective courses (9 to 15 credits):

The number of elective credits will vary depending on whether required introductory course is waived and whether the student chooses to do a 2-credit project or a 5-credit thesis.

- AVT 676 - Sound and Music for Video and Animation Credits: 5
- COMM 554 - Telecommunications Policy and Regulation Credits: 3
- COMM 590 - Seminar in Communication Credits: 3
- COMM 602 - Theories and Research of Mass Communication Credits: 3
- COMM 621 - Media Advocacy for Nonprofit Organizations Credits: 3
- COMM 636 - Communication Consulting Credits: 3
- COMM 656 - Global Communication Credits: 3
  or
- COMM 696 - Directed Readings and Research Credits: 1-3
- EDIT 571 - Tools for Visual/Graphic Design Credits: 1-3
- EDIT 572 - Tools for Digital Video and Audio Credits: 1-3
- EDIT 575 - Authoring Tools Credits: 1-3
- EDIT 771 - Introduction to Multimedia/Hypermedia Credits: 1-3
- EDIT 772 - Web-Based Instructional Tools Credits: 1-3
- HIST 697 - Creating History in New Media Credits: 3

Proposal (1 credit):
MAIS 797 - Interdisciplinary Studies Proposal Credits: 1

Project (2 - 5 credits) or thesis (5 credits):

- MAIS 798 - Individualized Studies Project Credits: 1-5
  or
- MAIS 799 - Individualized Studies Thesis Credits: 1-5

▲ MAIS Concentration in Women and Gender Studies (WGST)

This concentration is for students who wish to explore gender and women’s issues from a variety of disciplinary perspectives. The program combines graduate courses in women and gender studies with courses in a discipline of interest, such as history, literature, sociology, communication, health, education, or public policy. Expertise in the study of gender is increasingly applicable in a variety of professional and academic settings.

Students pursuing this concentration complete 36 credits.

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 cross-listed with WMST.

Elective courses (9 to 12 credits)

- Must take at least 6 credits in courses cross-listed with WMST that are not part of the disciplinary focus

Research methods (3 credits)

- Selected in consultation with advisor

Proposal (1 credit):

- MAIS 797 - Interdisciplinary Studies Proposal Credits: 1

Project (2 credits) or thesis (5 credits):
• MAIS 798 - Individualized Studies Project Credits: 1-5  
  or  
• MAIS 799 - Individualized Studies Thesis Credits: 1-5

▲ MAIS Concentration in Zoo and Aquarium Leadership (ZAL)

This program prepares students for advanced careers in modern professional zoos and aquariums. The curriculum is designed to enhance relevant social and analytical skills involving critical thinking, problem solving, information technology, and group interaction, as well as advance necessary skills in leadership and fiscal and personnel management.

Applicants to this program must be members of the Association of Zoos and Aquariums (aza.org).

Students pursuing this concentration must successfully complete 36 graduate credits.

Four core courses (12 credits):

• PUAD 505 - Introduction to Management of Nonprofits Credits: 1-3  
• NCLC 510 - Institutional Records Keeping Credits: 3  
• NCLC 511 - Career Development Credits: 3  
• NCLC 520 - Conservation Education Credits: 3

Three cognate courses (9 credits):

The cognate courses are chosen in consultation with a faculty advisor and require the prior written approval of the director of the ZAL program.

Elective courses (9 to 12 credits)

• Approved by advisory committee and selected in consultation with faculty advisor

Proposal (1 credit):

Students must complete a minimum of 24 credits before enrolling in proposal.

• MAIS 797 - Interdisciplinary Studies Proposal Credits: 1

Project (2-5 credits) or thesis (5 credits):

• MAIS 798 - Individualized Studies Project Credits: 1-5  
  or  
• MAIS 799 - Individualized Studies Thesis Credits: 1-5
Note:

Admitted students who wish to take a course at another accredited institution and apply the credit to this concentration must receive prior approval from the ZAL program director, the MAIS program director, and the dean.

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), Ramos-Pellicia (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 cumulates 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 at least a 3.50 overall GPA and at least a 3.50 GPA within 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 then complete a two-course sequence – LAS 491 and LAS 492 – 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 at least a 3.5 in these two courses. Students who complete LAS 491 and LAS 492 do take LAS 499, the regular capstone class in the major.

**Undergraduate Degree**

**Latin American Studies, BA**

*Banner Code: LA-BA-LAS*

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**

In addition to satisfying university general education requirements and the requirements for a bachelor of arts 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 course (1 credit):**

- LAS 100 - Introduction to Latin American Studies Credits: 1

**Two courses (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:**

- GOVT 331 - Government and Politics of Latin America Credits: 3
- ANTH 302 - Peoples and Cultures of Latin America Credits: 3
- ECON 361 - Economic Development of Latin America Credits: 3
- GEOG 316 - Geography of Latin America Credits: 3

**One humanities course (3 credits) related to Latin America chosen from:**

- ENGL 333 - Folklore of the Americas 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.

Note:

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.

Undergraduate Interdisciplinary Minor

Latin American Studies Minor

Banner Code: LAS

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.

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 a minimum of 18 credits, distributed as follows:

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) in at least three departments
• 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. Selection of courses should be made in consultation with the program director.

■ Modern and Classical Languages

Phone: 703-993-1220
Web: mcl.gmu.edu

Faculty

Professors: Gilbert, Ricouart, Winkler

Associate professors: Berroa, Chamberlain, Christensen (chair), Goldin, Leeman, Levine, Rabin, Roman-Mendoza

Assistant professors: Carreño-Rodriguez, Markx, Olson, Ramos-Pellicia, Sanusi, So, Vivancos-Perez

Term associate professors: Zhang

Term assistant professors: Apitz, Falcon, Fujiwara, Fyfe, Quintana, Ruiz-Ross, Salawdeh, Vasilyeva

Term instructors: Chen, Hilmi, Kirsch, Lamothe, Mircea-Pines, Planas, Sweet

Course Work

This department offers all course work designated ARAB, CHIN, CLAS, FREN, FRLN, GERM, GREE, HEBR, ITAL, JAPA, KORE, LATN, RUSS, and SPAN in the Courses chapter of this catalog.

The following courses are offered in English. Knowledge of a foreign language is not required: ARAB 325; CHIN 310, 311, 320, 325, 328; FREN 325, 329; GERM 301, 325; ITAL 325; JAPA 320; RUSS 325, 326, 327, 353, 354; SPAN 321, 322, 325, 329; and all courses designated CLAS and FRLN.

Courses numbered 325 may be repeated once for credit if the authors studied are different.

General Education Requirements

The department offers courses approved to fulfill university general education requirements: RUSS 354 and SPAN 322 fulfill the general education requirement in global understanding; FRLN 385, RUSS 353, and SPAN 388 fulfill the general education synthesis requirement; a number of courses fulfill the general education requirement in literature; RUSS 354 and SPAN 322, which are approved to fulfill the general education requirement in global understanding. See the University General Education chapter of the catalog.

College-Level 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 Sciences and the College of Science. FREN 451, RUSS 353, and RUSS 354 fulfill the college-level requirement in non-Western culture.

Undergraduate Programs
The department offers a bachelor's degree in foreign languages with concentrations in French and Spanish.

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, 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.

Both 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.

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.

Minors

Language majors are encouraged to complete a minor in another field.

The department offers minors in classical studies, Japanese studies, Chinese, French, German, Latin, Russian, and Spanish. They are available to students in any major. Except for classical studies, all the minors have as a prerequisite the completion of an intermediate course in the relevant language.

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.

Students are encouraged to participate in the many study abroad programs offered by Mason. These include short courses during winter and spring breaks as well as semester-long programs in the French and Spanish speaking regions of the world.

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

The bachelor of arts degree in foreign languages, which offers concentrations in French and Spanish, prepares students for teaching careers at the secondary school level, graduate study in languages, and research and professional work in government and private enterprise. Language majors are encouraged to complete a minor or, if possible, a second major in another field. Students who want a double major in a language and another subject should plan a program of study in consultation with advisors from both disciplines.

This program of study is offered by the Department of Modern and Classical Languages.

Degree Requirements

▲ Concentration in French (FRN)

In addition to satisfying university general education requirements and the requirements for a bachelor of arts degree in the College of Humanities and Social Sciences, students pursuing this concentration must complete a minimum of 33 credits in French courses 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.

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 elective courses (9 credits) in FREN at the 300-level or above

Four courses (12 credits) of FREN courses at the 400-level or above

Note:

No more than one course (3 credits) conducted in English (e.g. FREN 325, 329) may be used to fulfill requirements for the concentration in French.

▲ Concentration in Spanish (SPN)
In addition to satisfying university general education requirements and the requirements for a bachelor of arts degree in the College of Humanities and Social Sciences, students pursuing this concentration must complete a minimum of 33 credits in Spanish courses at the 300-level and above, each with a minimum grade of 2.00.

Core courses (6 credits):

- SPAN 305 - Spanish in Context I Credits: 3
- 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
- One elective 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 SPAN courses at the 400 level (12 credits)

Two elective courses (6 credits) in Spanish

- May include other SPAN courses not specifically required or not used to fulfill another requirement

Note:

With approval of the department, one course taught in English (3 credits) may be applied toward the concentration in Spanish.

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. See the English Department section of this chapter.

- CL 300 - Introduction to Comparative Literature Credits: 3
- CL 514 - Theories of Comparative Literature Credits: 3

Notes:

Students should consult with their advisor to design a program of study focusing on a specific genre, period, issue, or other cross-cultural topic.
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 FREN 309 or SPAN 370.

Undergraduate Minor

Chinese Minor

Banner Code: CHIN

The minor in Chinese studies 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 courses (9 credits) 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) 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

One additional Chinese course (3 credits) chosen from either of the above groups

One course (3 credits) chosen from:

- CHIN 310 - Survey of Chinese Literature Credits: 3
- CHIN 311 - Modern Chinese Literature in Translation Credits: 3
CHIN 320 - Contemporary Chinese Film Credits: 3
ARTH 384 - Arts of China Credits: 3
HIST 353 - History of Traditional China Credits: 3
HIST 354 - Modern China Credits: 3
HIST 355 - Women and Family in Chinese History Credits: 3
HIST 387 - Topics in Global History Credits: 3
RELI 314 - Chinese Philosophies and Religious Traditions Credits: 3

Classical Studies Minor

Banner Code: CLA

The minor in Classical studies is designed for students who wish to become familiar with the classical cultures and broaden their knowledge of the foundations of Western civilization and for students who are studying other areas of the humanities, especially English, languages, comparative literature, history, art history, philosophy, or religion. The minor provides enough flexibility for students to choose relevant courses according to their primary interests.

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 with a minimum grade of 2.00.

Two courses (6 credits) in classics, including:

- CLAS 250 - Classical Mythology Credits: 3

One course (3 credits) in classical history:

- HIST 301 - Classical Greece Credits: 3
- HIST 302 - Classical Rome Credits: 3
- HIST 304 - Western Europe in the Middle Ages Credits: 3
- HIST 388 - Topics in European History Credits: 3
- HIST 480 - Alexander the Great Credits: 3

One course (3 credits) in classical art history, classical philosophy, or religious studies

Two elective courses (6 credits)

- Chosen from classical art history, classics, classical history, classical philosophy, and religious studies
**French Minor**

*Banner Code: FRN*

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.

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 elective courses (9 credits) in FREN at the 300 level or above

**German Minor**

*Banner Code: GRM*

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 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 course (3 credits) chosen from:

• GERM 301 - Culture and Civilization Credits: 3
• GERM 340 - Survey of German Literature Credits: 3

One course (3 credits) from genre courses at the 300 level or period courses at the 400 level

One German elective course (3 credits) at the 300 level or above

Japanese Studies Minor

Banner Code: JPNS

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.

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, such as HIST 387, when relevant, may be applied to the minor with prior written approval of the coordinator.

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 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 the Orient Credits: 3
• RELI 315 - The Buddhist Tradition Credits: 3

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

• 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 the Orient Credits: 3
• RELI 315 - The Buddhist Tradition Credits: 3
Latin Minor

Banner Code: LATN

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.

Six courses (18 credits) chosen from:

- 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

Note:

Courses vary in content and may be repeated for credit.

Total: 18 credits

Russian Minor

Banner Code: RUS

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 the intermediate proficiency level with a minimum grade of 2.00 in each course.

Three courses (9 credits) chosen from:

- RUSS 302 - Russian Conversation and Composition Credits: 3
  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) 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 Russian elective course (3 credits) at the 300 level or above

• Course must be conducted in Russian.

Spanish Minor

Banner Code: SPN

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.

One or two required courses (6 credits):

• SPAN 305 - Spanish in Context I Credits: 3
• 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
• One elective course in Spanish (3 credits)

Two additional required courses (6 credits):
• SPAN 370 - Spanish Writing and Stylistics Credits: 3

and 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

• Not to include courses taught in English

Master’s Degree

Foreign Languages, MA

Banner Code: LA-MA-FRLN

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

In addition to satisfying general admission requirements for graduate study, applicants must hold a baccalaureate degree in French or Spanish, have at least a 3.00 GPA (on a 4.00 scale) in the field, and submit three letters of recommendation from people familiar with their academic qualifications.

Applicants whose baccalaureate degrees were earned in other fields or who otherwise do not meet the above requirements but who provide evidence of a capacity to pursue graduate study are encouraged to apply and may be admitted to the program with provisional status. Applicants in this category may be asked to appear for a personal interview and take the appropriate parts of the GRE. They may also have undergraduate deficiencies to make up before having the provisional qualifier removed.

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 three 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.

**Literature courses**

- At least 6 credits in literature courses covering two different periods

**Language and linguistics courses**

- At least 6 credits in language and linguistics courses

**French elective courses**

- At least 6 credits of French elective courses in literature or language

**Elective courses (12 credits), up to 6 credits may be used for directed reading and research, and thesis:**

- FREN 798 - Directed Reading and Research Credits: 3
- FREN 799 - Thesis Credits: 1-6

▲ Concentration in Spanish (SPN)

Students pursuing this concentration must complete 30 credits.

**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

**Three courses (9 credits) in Spanish:**

- 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

**Elective courses (12 credits) chosen from:**

- Additional courses in Spanish language and literature, including courses taken through the Consortium of Universities of the Washington Metropolitan Area
- Courses under the rubric FRLN
- Courses transferred from other universities, including study abroad
- Up to 6 credits of courses in related fields
Notes:

Full-time students must take the core courses in their first year. Part-time students must include these courses within their first 12 credits.

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.

▲ Concentration in Spanish and French (SF)

Students pursuing this concentration must complete 42 credits.

French

- 18 credits in French distributed according to the requirements (not electives) for the concentration in French

Spanish

- 18 credits in Spanish distributed according to the requirements (not electives) for the concentration in Spanish

Elective courses (6 credits), which may include directed reading and research, or thesis:

A maximum of 6 credits of 798 and 799 may be applied to the elective courses.

- FREN 798 - Directed Reading and Research Credits: 3
- SPAN 798 - Directed Reading and Research Credits: 3
- FREN 799 - Thesis Credits: 1-6
- SPAN 799 - Thesis Credits: 1-6

▲ Concentration in Spanish/Bilingual-Multicultural Education (SBM)

Students pursuing this concentration must complete 36 credits.

At least 18 credits in SPAN distributed according to the requirements (not electives) for the concentration in Spanish

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
Elective courses (12 credits), of which up to 6 may include directed reading and research or thesis:

- SPAN 798 - Directed Reading and Research Credits: 3
- SPAN 799 - Thesis Credits: 1-6

**Philosophy**

Phone: 703-993-1290  
Web: philosophy.gmu.edu

**Faculty**

**Professors:** Bergoffen, Rothbart  
**Associate professors:** Cherubin, De Nys, Eckenwiler, Froman, Holman, Kinnaman (chair), Light, Paden  
**Term professor:** Boyd  
**Adjunct professors:** D. Gregory, J. Miller, Oberoi, Register, Sigrist, Sojka, Van Camp

**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 in the major of 3.50. 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.

To receive honors in the major, students must 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 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 and in professional ethics. 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.

With its focus on traditional and contemporary philosophy, the master's degree program provides students with a historical and pluralistic approach to philosophical questions. The concentration in professional ethics gives students the opportunity to explore the ethical and philosophical issues that arise in such professional 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.

Students are encouraged to pursue opportunities beyond the classroom such as study abroad, professional internships, and research with faculty members.

The department also offers a graduate certificate in professional ethics for those students interested in combining the study of ethics in a variety of career settings. Students may earn the certificate as a stand alone program or pursue it concurrently with a graduate degree program. Part of the coursework for the certificate may be able to be applied also to a degree program. Students must apply and be admitted to the graduate certificate program.

Undergraduate Degree

Philosophy, BA

Banner Code: LA-BA-PHIL
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

In addition to satisfying university general education requirements and the requirements for a bachelor of arts 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. The credits must be distributed among area requirements as indicated below. No course may be used to fulfill more than one requirement.

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 the requirements in the analytic tradition, the continental tradition, or the ethics and social and political philosophy.

The following philosophy courses fulfill the general education synthesis requirement: PHIL 309, 343, 377, and 378.

One course (3 credits) in logic:

- 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:

- 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:

- 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

- 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 355 - Theories of Ethics Credits: 3
- PHIL 429 - International Ethics Credits: 3
- PHIL 470 - Seminar: Philosophical Examination of Social Issues and the Law Credits: 3

Five elective courses (15 credits) in philosophy

- Chosen from any PHIL courses including those listed above that are not used to meet the specific requirement

▲ Concentration in Philosophy and Law (PHLW)

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 satisfying the university-wide general education requirements and the requirements for a BA degree in the College of Humanities and Social Sciences, students pursuing this concentration must successfully complete 33 credits, earning a minimum grade of 2.00 in each course, with at least 6 credits at the 400 level or above.

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.

Five courses (15 credits) from four of the area categories above

- logic (3 credits)
- history of philosophy (6 credits)
- the analytic tradition (3 credits)
- the continental tradition (3 credits)

One required course (3 credits) in philosophy and law:

- PHIL 311 - Philosophy of Law Credits: 3

At least two courses (6 credits) chosen from:

- PHIL 323 - Classical Western Political Theory Credits: 3
  or
- GOVT 323 - Classical Western Political Theory Credits: 3
- PHIL 324 - Modern Western Political Theory Credits: 3
At least three additional elective courses in philosophy (9 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 coordinator for other courses that can be taken to fulfill this requirement.

Undergraduate Minor

Philosophy and Law Minor

Banner Code: PHLW

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.

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) chosen from the list below

One elective course may be chosen from other course work in philosophy with prior written approval of the undergraduate director.

• PHIL 323 - Classical Western Political Theory Credits: 3
  or
• GOVT 323 - Classical Western Political Theory Credits: 3

• PHIL 324 - Modern Western Political Theory Credits: 3
  or
• GOVT 324 - Modern Western Political Theory Credits: 3

• PHIL 327 - Contemporary Western Political Theory Credits: 3
  or
• GOVT 327 - Contemporary Western Political Theory Credits: 3

• PHIL 428 - Advanced Democratic Theory Credits: 3
  or
• GOVT 428 - Advanced Democratic Theory Credits: 3

• GOVT 448 - Ethics and International Politics Credits: 3
• PHIL 429 - International Ethics Credits: 3
• PHIL 470 - Seminar: Philosophical Examination of Social Issues and the Law Credits: 3

Total: 18 credits

Philosophy Minor

Banner Code: PHIL

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 180 - Logic and Law 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

Highly qualified Mason undergraduates may apply to the accelerated master’s degree program and obtain both bachelor’s and master’s degrees in philosophy after satisfactory completion of 144 credits, sometimes within five years.

Well-prepared undergraduates are encouraged to apply as they near completion of 90 credits. Admitted students are able to use up to 6 graduate credits (courses at the 500 or 600 level) in partial fulfillment of requirements for the undergraduate degree. Students may also take a maximum of 6 additional graduate credits while they are still undergraduates but mark them as reserve graduate credit. Reserve graduate credits apply only to the master’s degree. On completion and conferral of the undergraduate degree with satisfactory performance in graduate courses (minimum grade of 3.00 in each course), students are given advanced standing in the master’s program. All other master’s degree requirements must be met. Interested students should contact the department for details about the application process.

Master's Degree
Philosophy, MA

Banner Code: LA-MA-PHIL

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 can do a master's degree with a focus on traditional and contemporary philosophy or chose one of two concentrations. All 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

In addition to fulfilling university admission requirements for graduate study, applicants must submit three letters of recommendation, a statement of student goals in pursuing the degree, and a writing sample. GRE exams are not required. They are recommended, however, especially for those students planning to pursue a PhD in philosophy.

Degree Requirements

Students pursuing this degree must successfully complete 30 credits, which may include a project or thesis. Students need to identify an advisor on entering the program and meet regularly with that advisor during their course of study. With their advisor’s approval, students may apply up to 9 credits from other departments toward the degree.

Four courses (12 credits) of required course work:

One course (3 credits) in ancient or medieval philosophy

- PHIL 602 - Plato: Selected Dialogues Credits: 3
- PHIL 604 - Augustine and Aquinas Credits: 3
- PHIL 681 - Philosophical Figures Credits: 3
- PHIL 691 - Special Topics in Philosophy Credits: 1-6 (where appropriate)

One course (3 credits) in modern philosophy

- PHIL 605 - Mind-Body Problem in Early Modern Philosophy Credits: 3
- PHIL 608 - Hegel's Phenomenology of the Spirit Credits: 3
- PHIL 681 - Philosophical Figures Credits: 3
- PHIL 691 - Special Topics in Philosophy Credits: 1-6 (where appropriate)

One course (3 credits) in contemporary philosophy

- PHIL 610 - Contemporary Issues Credits: 3
- PHIL 611 - Contemporary Issues Credits: 3
- PHIL 691 - Special Topics in Philosophy Credits: 1-6 (where appropriate)
• PHIL 615 - Postmodernist Thought Credits: 3
• PHIL 616 - Phenomenology Credits: 3
• PHIL 618 - Contemporary French Feminism Credits: 3
• PHIL 681 - Philosophical Figures Credits: 3
• PHIL 691 - Special Topics in Philosophy Credits: 1-6 (where appropriate)

One course (3 credits) in an advanced seminar

• 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

Six elective courses (18 credits)

3-6 credits of thesis (optional)

Students who do a thesis take one or two fewer elective courses, depending on their number of thesis credits.

• PHIL 799 - Thesis Credits: 1-6

▲ Concentration in Philosophy and Cultural Theory (PHCT)

Four courses (12 credits) in philosophy:

One course (3 credits) in ancient or medieval philosophy

• PHIL 602 - Plato: Selected Dialogues Credits: 3
• PHIL 604 - Augustine and Aquinas Credits: 3
• PHIL 681 - Philosophical Figures Credits: 3
• PHIL 691 - Special Topics in Philosophy Credits: 1-6 (where appropriate)

One course (3 credits) in modern philosophy

• PHIL 605 - Mind-Body Problem in Early Modern Philosophy Credits: 3
• PHIL 608 - Hegel's Phenomenology of the Spirit Credits: 3
• PHIL 681 - Philosophical Figures Credits: 3
• PHIL 691 - Special Topics in Philosophy Credits: 1-6 (where appropriate)

One course (3 credits) in contemporary philosophy
• PHIL 615 - Postmodernist Thought Credits: 3
• PHIL 616 - Phenomenology Credits: 3
• PHIL 618 - Contemporary French Feminism Credits: 3
• PHIL 681 - Philosophical Figures Credits: 3
• PHIL 691 - Special Topics in Philosophy Credits: 1-6 (where appropriate)

One course (3 credits) in an advanced seminar

• 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

One required course (3 credits) in cultural studies

Students are encouraged to take this course as early in their program as possible.

• CULT 820 - After Colonialism: Race, Ethnicity, Nationalism Credits: 3

One elective course (3 credits) in cultural studies

Four elective courses (12 credits)

3-6 credits of thesis (optional)

Students who do a thesis take one or two fewer elective courses, depending on their number of thesis credits.

• PHIL 799 - Thesis Credits: 1-6

Total: 30 credits

▲ Concentration in Professional Ethics (PETH)

With prior written approval of the graduate director, PHIL 691 - Special Topics in Philosophy and PHIL 721 - Advanced Seminar in Philosophy, when relevant, may be able used to fulfill some of the requirements for this concentration.

One required course (3 credits) in the history of philosophy:
• PHIL 640 - History of Ethical Theory Credits: 3

One elective course (3 credits) in the history of philosophy chosen from:

• PHIL 602 - Plato: Selected Dialogues Credits: 3
• PHIL 604 - Augustine and Aquinas Credits: 3
• PHIL 605 - Mind-Body Problem in Early Modern Philosophy Credits: 3
• PHIL 608 - Hegel's Phenomenology of the Spirit Credits: 3
• PHIL 681 - Philosophical Figures Credits: 3
• PHIL 691 - Special Topics in Philosophy Credits: 1-6

One course (3 credits) in professional ethics

• PHIL 641 - Ethics and the Professions Credits: 3

Two courses (6 credits) in applied 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 five elective courses (9-15 credits)

3-6 credits of thesis (optional)

Students who do a thesis take one or two fewer elective courses, depending on their number of thesis credits.

• PHIL 799 - Thesis Credits: 1-6

Total: 30 credits

Master's Level Certificate

Professional Ethics Graduate Certificate
Students must be admitted to graduate study or approved for graduate course enrollment in nondegree status. Students who initially enroll in the certificate program as nondegree students must apply for admission to the graduate program no later than the second semester of study. The certificate may be pursued concurrently with any other graduate program in the university.

This program of study is offered by the Department of Philosophy.

For policies governing all certificates, see the Academic Policies chapter of the catalog.

Certificate Requirements

Students pursuing this certificate must successfully complete 15 graduate credits. In consultation with an advisor, students should select their courses to create a coherent program of study.

One course (3 credits) in the history of ethical theory:

- PHIL 640 - History of Ethical Theory Credits: 3

Two courses (6 credits) in applied ethics chosen from:

- PHIL 642 - Biomedical Ethics Credits: 3
- PHIL 643 - Environmental Ethics Credits: 3
- PHIL 644 - Business and Organizational Ethics Credits: 3

Two elective courses (6 credits)

- This requirement may be fulfilled by taking courses in philosophy, but students are encouraged to take courses in other disciplines.

Total: 15 credits

Psychology

Phone: 703-993-1342
Web: gmu.edu/departments/psychology

Faculty

Professors: Ascoli, Boehm-Davis (chair), Cortina (associate chair for graduate studies), Denham (director, Applied Developmental Program), Klimoski, Maddux, Mandes, Naglieri, Parasuraman (director, Human Factors/Applied Cognition Program), Pasnak, Riskind, Rojahn (director, School Psychology Program, director, Center for Cognitive Development), R. Smith (director, Biopsychology Program), Tangney, Tetrick (director, Industrial/Organizational Program), Winsler, Zaccaro
**Research professors:** Butler, Olds

**Associate professors:** Bitler, Blackwell, Buffardi, Flinn, Greenwood, Kello, Kozhevnikov, Peterson, Sanford (associate chair for undergraduate studies), Short (director, Clinical Program)

**Research associate professors:** Bachus, Warren

**Assistant professors:** Baldwin, Cattaneo, Dalal, Kashdan, Kaplan, King, McKnight, Mohr, Monk, Perez-Edgar, Rowe, Thompson

**Term associate professors:** Chrosniak, Wanschura

**Research assistant professors:** Bassett, Fu, McDonald, Stuewig, Tran

**Term assistant professors:** Battaglia, Hurley, Meier

**Affiliates:** Eby, Hunt

**Adjuncts:** Anderson, Bene, Curtin, Dechman, Hawley, Hirsch, Levitas, Mayfield, Perez, Pomeroy, Schumann, Shiraev, Stanhope, Steve, Werber

## 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.

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 cumulates in the successful completion and presentation of an independent honors thesis. To graduate with honors, students must earn at least 3.50 in the three 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.
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 and a graduate degree in psychology, the master's 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, biopsychology, 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 in school psychology as well as a certificate of advanced graduate studies 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

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

In addition to satisfying university general education requirements and the requirements for a bachelor of science degree in the College of Humanities and Social Sciences, students pursuing this degree must complete the following course work.

Two foundation courses in biology (8 credits):

- BIOL 213 - Cell Structure and Function Credits: 4
- BIOL 303 - Animal Biology Credits: 4

Two foundation courses in chemistry* (8 credits):

- CHEM 211 - General Chemistry Credits: 4
- CHEM 212 - General Chemistry Credits: 4

One foundation course in mathematics (3 or 4 credits) chosen from:

- 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 foundation 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 foundation courses in physics (8 credits):
Take one of the following sequences 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

- 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 foundation courses in psychology (9 credits):

- 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 foundation course in computer science (4 credits):

- CS 112 - Introduction to Computer Programming Credits: 4

Two core courses in neuroscience (6 credits):

- NSCI 327 - Cellular, Neurophysiological, and Pharmacological Neuroscience Credits: 3
- NSCI 335 - Molecular, Developmental, and Systems Neuroscience Credits: 3

One required psychology lab course (1 credit):

- PSYC 373 - Physiological Psychology Laboratory Credits: 1

Foundation area electives (12 credits)

- See advisor for list of elective courses in foundation areas.

Neuroscience electives (12 credits)

- See advisor for list of elective courses in neuroscience.

Notes:

The program requirements also meet the university general education requirements in quantitative reasoning, social and behavioral science, and natural science.
*Students intending to pursue a PhD program in neuroscience or an MD are advised to take CHEM 313 and 315 and MATH 114.

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. See advisor for list of approved writing intensive courses for neuroscience.

Psychology, BA

Banner Code: LA-BA-PSYC

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

In addition to satisfying university general education requirements and the requirements for a bachelor of arts degree in the College of Humanities and Social Sciences, students pursuing this degree must complete 36 credits in psychology, 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 C- (1.67) in each of the courses.

One required introductory course (3 credits):

- PSYC 100 - Basic Concepts in Psychology Credits: 3

Four or five foundational courses (12 or 15 credits):

- PSYC 231 - Social Psychology Credits: 3
- PSYC 317 - Cognitive Psychology Credits: 3
- PSYC 325 - Abnormal Psychology Credits: 3
  and
- PSYC 211 - Developmental Psychology Credits: 3
  or two of the following:
  - PSYC 313 - Child Psychology Credits: 3
  - PSYC 314 - Adolescent Psychology Credits: 3
  - PSYC 415 - Psychological Factors in Aging Credits: 3

Two research methods courses (7 credits):
- PSYC 300 - Statistics in Psychology Credits: 4
- PSYC 301 - Research Methods in 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

One course (3 credits) in history and systems:

- PSYC 465 - History and Systems in Psychology Credits: 3

2-8 credits of electives

Students complete the 36 required credits with electives in psychology (PSYC).

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.

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.

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, 422, 548, and 549 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

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

In addition to satisfying university general education requirements and the requirements for a bachelor of science degree in the College of Humanities and Social Sciences, students pursuing this degree must complete the following coursework with a minimum GPA of 2.00.

38 credits in psychology:

24 of these credits must be at the 300 and 400 levels. Students must have a minimum grade of C- [1.67] in each of the courses used to fulfill this requirement.

One required introductory course (3 credits):

- PSYC 100 - Basic Concepts in Psychology Credits: 3

Four or five foundational courses (12 or 15 credits):

- PSYC 231 - Social Psychology Credits: 3
- PSYC 317 - Cognitive Psychology Credits: 3
- PSYC 325 - Abnormal Psychology Credits: 3
  and
- PSYC 211 - Developmental Psychology Credits: 3
  or two of the following:
  - PSYC 313 - Child Psychology Credits: 3
  - PSYC 314 - Adolescent Psychology Credits: 3
  - PSYC 415 - Psychological Factors in Aging Credits: 3

Two research methods courses (7 credits):

- PSYC 300 - Statistics in Psychology Credits: 4
- PSYC 301 - Research Methods in 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

One course (3 credits) in history and systems:

- PSYC 465 - History and Systems in Psychology Credits: 3

One of the following:

- 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

Elective credits

Students complete the 38 required credits in psychology (PSYC) with electives.

14 credits of natural science:

Two required science courses (8 credits):

- BIOL 103 - Introductory Biology I Credits: 4
- BIOL 104 - Introductory Biology II Credits: 4

6 credits of elective science courses chosen from:

Any course in ASTR, BIOL, CHEM, GEOL, PHYS or the following:
- GEOG 102 - Physical Geography Credits: 3
- GEOG 309 - Introduction to Meteorology and Climate Credits: 3
- UNIV 301 - Great Ideas in Science Credits: 3

6 credits of mathematics chosen from:

- MATH 108 - Introductory Calculus with Business Applications Credits: 3
- MATH 110 - Introductory Probability and Statistics 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

6 credits in social and behavioral sciences

Courses in psychology, GEOG 102, and GEOG 309 may not be used to fulfill this requirement.

3 credits in arts, philosophy, or religious studies

PHIL 173 and PHIL 376 may not be used to fulfill this requirement.

3 additional credits in arts, philosophy, religious studies, or social and behavioral sciences

Courses in psychology, GEOG 102, GEOG 309, PHIL 173, and PHIL 376 may not be used to fulfill this requirement.

One technical writing or psychology lab science course (3 or 4 credits) chosen from:

- ENGL 410 - 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

Notes

Students who have limited technology skills are encouraged to take IT 103.

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.
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, 422, 548, and 549 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

Psychology Minor

Banner Code: PSYC

The minor in psychology is open to students who major in any other discipline.

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 in psychology distributed as follows:

One required course (3 credits):

- PSYC 100 - Basic Concepts in Psychology Credits: 3

Three courses (9 credits) from three of the following five areas, at least one area must be cognition or physiological:

Developmental:

- PSYC 211 - Developmental Psychology Credits: 3
- PSYC 313 - Child Psychology Credits: 3

Social/personality:
• PSYC 231 - Social Psychology Credits: 3
• PSYC 324 - Personality Theory Credits: 3

Cognition:
• PSYC 317 - Cognitive Psychology Credits: 3

Abnormal:
• PSYC 325 - Abnormal 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

Additional psychology courses (6 credits):
No more than 3 credits taken from each.
• PSYC 260 - Basic Research Methods in Psychology Credits: 1-3
• PSYC 350 - Directed Reading and Research in Psychology Credits: 1-3
• PSYC 460 - Independent Study in Psychology Credits: 1-3

Notes:
Related course work in psychology can enhance many different majors. Please contact the Undergraduate Psychology Office or the Psychology Department web site for a list of suggested courses for students who are majoring in specific disciplines or areas of study that interact well with psychology.

Total: 18 credits

Bachelor's/Accelerated Master's Program

Psychology, BA or BS/Psychology, Accelerated MA (Biopsychology)
Highly qualified undergraduates may apply to the accelerated master’s degree program and obtain a bachelor’s in psychology and a master’s in psychology with a concentration in biopsychology following satisfactory completion of 146 credits. Well-prepared undergraduates are encouraged to apply as they near completion of 90 credits. Admitted students are able to use up to 6 graduate credits in partial fulfillment of requirements for the undergraduate degree. On completion and conferral of the undergraduate degree with satisfactory graduate-level performance (3.00 in each course, grade of B or better) in graduate courses, students are given advanced standing in the master’s program. All other master’s degree requirements must be met. This program is available only to students pursuing the concentration in biopsychology. Interested students should contact the department for details about the application process.

Master's Degree

Psychology, MA

Banner Code: LA-MA-PSYC

The master’s degree in psychology has concentrations in applied developmental psychology, biopsychology, 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 masters degree, see the Academic Policies chapter of the catalog.

Application Requirements

In addition to fulfilling admission requirements for graduate study, applicants must have 15 credits in psychology including a course in statistics and a laboratory course in psychology. In addition, school psychology requires courses in personality or abnormal psychology, developmental psychology, and tests and measurements. All applicants are required to submit results of the GRE taken within the past five years (applicants should plan to take the GRE at least two months before the deadline); three letters of reference from professors or supervisors; and a departmental application. Applicants are asked to submit a biographical statement outlining their background and experience and describing their future goals in psychology.

Successful applicants have an overall GPA of 3.00 for the last 60 undergraduate credits, generally a minimum GPA of 3.25 in undergraduate psychology courses, and combined GRE scores of 1,000 or above. Work experience, publications, or special recommendations may compensate for deficiencies in other qualifications. Because the number of students admitted to each program is limited, meeting these minimum requirements does not guarantee admission.

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 can not 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 must complete this coursework in one of six concentrations.
A minimum of 9 credits of 798, 799, 597, or 792 may be applied toward the master's degree. A maximum of 6 credits of 798 and 799 may be applied to the master's degree.

▲ Concentration in Applied Developmental Psychology (APD)

The applied developmental psychology concentration 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.

Students must complete 32 graduate credits.

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 766 - Advanced Topics in Sensation and Perception Credits: 3
- PSYC 768 - Advanced Topics in Cognitive Science Credits: 3

Quantitative methods (8 credits):

- PSYC 611 - Advanced Statistics Credits: 4
- PSYC 612 - Advanced Statistics Credits: 4

Specialized content (8 credits) chosen from:

- PSYC 592 - Special Topics Credits: 3 (when the content is development)
- 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:

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: 1-3

Professional seminar (2 credits):

• PSYC 591 - Professional Seminar Credits: 1-3

Electives (4 credits)

Students complete the 32 credits required for this degree through a content course, practicum, or directed reading and research.

▲ Concentration in Biopsychology (BP)

The biopsychology concentration emphasizes training in the neurobiological bases of behavior. Students are prepared for doctoral work or employment in government or industry research laboratories.

Students must complete 32 graduate credits.

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

Two quantitative methods courses (8 credits):

- PSYC 611 - Advanced Statistics Credits: 4
- PSYC 612 - Advanced Statistics Credits: 4

Professional seminar (1 credit):

- PSYC 591 - Professional Seminar Credits: 1-3

Two courses (6 credits) chosen from:

- 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

Elective coursework

Students complete the 32 credits required for this degree through additional credits of course work or research.

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

▲ 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 32 credits of course work. Students must also be in good standing in the program, as determined by the director of clinical training.

Four required 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 823 - Scientific Foundations of Clinical Psychology II Credits: 3

Two courses (8 credits) in advanced statistics:

- PSYC 611 - Advanced Statistics Credits: 4
- PSYC 612 - Advanced Statistics Credits: 4

One course (3 credits) in practicum:

- PSYC 881 - Practicum in Clinical Psychology Credits: 3

One course (1 credit) in seminar:

- PSYC 890 - Seminar in Professional Psychology Credits: 1-3

Two courses (6 credits) chosen from:

**Biological Bases of Behavior:**

- 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

**Developmental Bases of Behavior:**

- PSYC 666 - Cognitive and Perceptual Development Credits: 3
- PSYC 669 - Social and Emotional Development Credits: 3
- PSYC 704 - Life-Span Development Credits: 3

**Social and Cognitive Foundations of Clinical Psychology:**

- PSYC 833 - Social And Cognitive Foundations Of Clinical Psychology Credits: 3
History, Systems, and Theories of Personality and Psychotherapy:

- PSYC 830 - History, Systems, and Theories of Personality and Psychotherapy Credits: 3

Social-Cognitive Interventions in Clinical Psychology:

- PSYC 831 - Social-Cognitive Interventions in Clinical Psychology Credits: 3

Community Psychology I:

- PSYC 840 - Community Psychology I Credits: 3

Community Psychology II:

- PSYC 841 - Community Psychology II Credits: 3

▲ 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.

Students must complete 32 graduate credits.

One core course (3 credits) chosen from:

- PSYC 701 - Cognitive Bases of Behavior Credits: 3
- PSYC 759 - Applied Decision Making Credits: 3
- PSYC 766 - Advanced Topics in Sensation and Perception Credits: 3
- PSYC 768 - Advanced Topics in Cognitive Science Credits: 3

Two courses (8 credits) of quantitative and research 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 766 - Advanced Topics in Sensation and Perception Credits: 3
- PSYC 768 - Advanced Topics in Cognitive Science Credits: 3

Electives

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

▲ 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.

Students pursuing this concentration must complete 32 graduate credits.

One core course (3 credits) chosen from:

- PSYC 667 - Behavior in Small Groups and Teams Credits: 3
- PSYC 701 - Cognitive Bases of Behavior Credits: 3
- PSYC 703 - Social Bases of Behavior Credits: 3

Two courses (8 credits) of quantitative and research methods:

- PSYC 611 - Advanced Statistics Credits: 4
- PSYC 612 - Advanced Statistics Credits: 4
Four courses (12 credits) of specialized content:

- PSYC 636 - Survey of Industrial Psychology Credits: 3
- PSYC 639 - Survey of Organizational Processes Credits: 3

and one course (3 credits) chosen from:

- PSYC 592 - Special Topics Credits: 3
- PSYC 735 - Psychological Perspectives on Organizational Development Credits: 3
- PSYC 739 - Seminar in Industrial/Organizational Psychology Credits: 3
- PSYC 741 - Psychology of Work Motivation Credits: 3

and one course (3 credits) chosen from:

- PSYC 557 - Psychometric Methods Credits: 3
- PSYC 592 - Special Topics Credits: 3
- PSYC 631 - Industrial and Personnel Testing and Evaluation Credits: 3
- 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 736 - Research in Human Performance Assessment Credits: 3

Electives

Students complete the 32 credits required for this degree through additional course work. A maximum of 6 credits may come from courses outside the department with prior written approval of the graduate director.

Practicum (optional) (1-6 credits)

Students need an advisor’s approval to register for practicum.

Thesis (optional) (3-6 credits)

Students need the chair’s approval to register for thesis.

▲ Concentration in School Psychology (SCH)

The concentration in school psychology consists of a combined master’s degree and the Certificate of Advanced Graduate Studies (CAGS).

The school psychology concentration is committed to 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 practicum and internship experiences.
The master’s degree concentration and certificate make up a degree program designed to prepare graduates for professional certification in school psychology. The program is approved by School Psychology Training Programs of the National Association of School Psychologists (NASP). Students completing the master’s degree and certification will be eligible for licensure in Virginia and certification or licensure in other states as a school psychologist. Please note that the certification or licensure as a school psychologist typically requires all course work for both the master’s degree and the certificate of advanced studies. (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 who have not already earned a master’s degree in a related field must apply for admission to both the master’s program and the certificate. All students entering the master’s program are expected to complete the certificate of advanced graduate studies. In other words, the master’s degree is not a terminal degree. Students who are completing an internship in the local area and wish to enroll in the internship class may do so by enrolling in nondegree status.

With approval of the school psychology faculty, graduate coordinator, and dean, 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.

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.

All students must complete a research project and, as part of the Certificate of Advanced Graduate Studies, a full year of internship. An unsatisfactory evaluation at any time by the School Psychology Committee may result in termination from the School Psychology Program.

Students pursuing the combined concentration in school psychology and certificate of Advanced Graduate Studies must complete 61 credits, with a minimum grade of 3.00 in each course.

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: 3 (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

Mandatory completion of School Psychology Certificate of Advanced Graduate Studies (15 credits)

Master's Level Certificate

Aviation Psychology Graduate Certificate

Banner Code: LA-CERG-AVIP

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.

Certificate Requirements

Students pursuing this certificate must successfully complete five courses (15 credits), distributed as follows:

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: 1-3 (when topic is approved for this certificate)
• PSYC 768 - Advanced Topics in Cognitive Science Credits: 3
• PSYC 766 - Advanced Topics in Sensation and Perception 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

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.

Certificate Requirements

Students pursuing this certificate must successfully complete six courses (18 credits), distributed as follows:

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 (repeatable, when topic is cognitive neuroscience)

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 702 - Biological Bases of Human Behavior Credits: 3
- PSYC 597 - Directed Reading and Research Credits: 1-3
- PSYC 766 - Advanced Topics in Sensation and Perception Credits: 3
- PSYC 768 - Advanced Topics in Cognitive Science Credits: 3

Note:

PSYC 597, 766, and 768, when topic is relevant, may be used to fulfill this requirement with prior written approval of the program director.
Total: 18 credits

School Psychology Certificate of Advanced Graduate Studies

Banner Code: LA-CERM-ASP

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.

Certificate Requirements

Students pursuing this certificate must have successfully completed the master’s degree in psychology 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: 3 (when topic is Developmental Assessment)
- PSYC 630 - Developmental Disabilities Credits: 3
- EDCD 608 - Group Processes and Analyses Credits: 4

Two assessment practicum’s (4 credits):

- PSYC 751 - School Psychology Assessment Practicum II Credits: 2

6 credits of internship

- PSYC 790 - School Psychology Internship Credits: 3-12

2 credits of practicum:

- PSYC 792 - Practicum in Developmental Psychology, Biopsychology, and School Psychology Credits: 1-6
Total: 15 credits

Usability Graduate Certificate

Banner Code: LA-CERG-UBTY

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.

Certificate Requirements

Students pursuing this certificate must successfully complete five courses (15 credits), distributed as follows:

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: 1-3 (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 766 - Advanced Topics in Sensation and Perception 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
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: industrial/organizational psychology, human factors/applied cognition, clinical psychology, applied developmental psychology, and biopsychology.

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

Entering students are accepted only for fall semesters. The department does not usually consider applications that fail to meet the minimum criteria of 3.00 undergraduate GPA, 3.25 GPA in psychology course work, and combined GRE scores of 1,100. Applicants who meet this minimum receive continued consideration for the final candidate pool on the basis of experience, letters of recommendation, objective test scores, and (in some programs) an interview. No specific set of qualifications guarantees admission.

In addition to admission materials required by the university, applicants must submit the following:

- Completed Department of Psychology form
- Three letters of recommendation from individuals who have firsthand knowledge of the applicant’s academic capabilities or work experience
- A two- to three-page typewritten personal statement describing professional goals, training history, and reasons for seeking the PhD
- GRE results taken within the past five years and before the application deadline. Applicants should take the GRE by October because applications cannot be processed until these scores are received. Scores must be sent directly from Educational Testing Service, P.O. Box 955, Princeton, NJ 08541. Only the aptitude scores are required, but scores for the Advanced Test in Psychology may also be submitted.

Applicants are responsible for ensuring that all materials arrive before the application deadline. Also, applicants in the final candidate pool may be required to participate in an interview.

In addition to fulfilling admission requirements, applicants are expected to have the following:

- For the PhD with a concentration in industrial/organizational psychology or in human factors/applied cognition, at least 15 credits in psychology, including a statistics course and a laboratory course in psychology. A tests and measurements course is recommended.
- For the PhD with a concentration in clinical psychology, at least 15 credits in psychology, including a statistics course, laboratory science course, and abnormal psychology. Courses in developmental psychology, personality, physiological psychology, and tests and measurements are desirable.
- For the PhD with a concentration in applied developmental psychology, at least 15 credits in psychology, including statistics and a laboratory course in experimental psychology. Courses in personality, abnormal psychology, developmental psychology, and tests and measurements are also required for applicants to the school psychology concentration within the MA program.
- For the PhD with a concentration in biopsychology, at least 15 hours of psychology, including physiological psychology, statistics, and a lab course in experimental psychology.

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 required, nonelective course work on their approved program of study. Students must also successfully complete and pass written and oral comprehensive exams.

Dissertation

The dissertation requirement is designed to demonstrate the student’s ability to apply psychological principles to research problems. Students must take at least 3 credits of proposal (998) and 3 credits of research (999), and have at least 12 credits of 998 and 999 combined. (No more than 12 credits of 998 and 999 may be applied toward the degree.) Once enrolled in 998, a student must maintain continuous registration in 998 or 999 each semester until the dissertation is submitted to and accepted by University Libraries.

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 – 74 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 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.

**Developmental core (3 credits)**

- PSYC 704 - Life-Span Development Credits: 3

**Cognitive, biological, social, or history core (6 credits) chosen from:**

- PSYC 701 - Cognitive Bases of Behavior Credits: 3
- PSYC 702 - Biological Bases of Human Behavior Credits: 3
- PSYC 703 - Social Bases of Behavior Credits: 3
- PSYC 705 - Historical and Philosophical Issues in Psychology Credits: 3

**Quantitative methods (8 credits):**

- PSYC 611 - Advanced Statistics Credits: 4
- PSYC 612 - Advanced Statistics Credits: 4

**Advanced specialized methods (9 credits), including the following:**

**Quantitative methods (at least 3 credits):**

- 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

**Research methods (at least 3 credits):**

- PSYC 646 - Issues and Methods in Longitudinal Developmental Research Credits: 3
- PSYC 654 - Naturalistic Methods in Psychology Credits: 3
Specialized methods:

- 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
- EDSE 649 - Advanced Clinical Psycho-Educational Assessment in Special Education Credits: 3

Specialized content (15 credits):

Foundations (at least 9 credits):

- PSYC 666 - Cognitive and Perceptual Development Credits: 3 (required)
- PSYC 614 - The Psychology of Aging Credits: 3
- PSYC 615 - Language Development Credits: 3
- PSYC 669 - Social and Emotional Development Credits: 3
- PSYC 892 - Special Topics in Psychology Credits: 3

Applications:

- PSYC 630 - Developmental Disabilities Credits: 3
- PSYC 648 - Developmental Psychopathology Credits: 3
- PSYC 780 - Applied Developmental Psychology Credits: 3

Professional seminar/professional ethics (3 credits)

- Taken during first year: fall, 2 credits; spring, 1 credit

Directed Reading and Research (8 credits):

- PSYC 897 - Directed Reading and Research Credits: 1-3

Dissertation (12 credits):

At least 3 credits of 998 and 3 credits of 999

- PSYC 998 - Doctoral Dissertation Proposal Credits: variable
- PSYC 999 - Doctoral Dissertation Credits: variable
Elective courses (0 to 8 credits)

Practicum (0 to 6 credits)

- PSYC 792 - Practicum in Developmental Psychology, Biopsychology, and School Psychology Credits: 1-6

Notes:

PSYC 703, 710, 722 can be taken only by students concurrently enrolled in school psychology MA concentration.

In addition, students are required to complete a second-year research project before they can take comprehensive exams. The expectation is that the research will be submitted for presentation at a national conference or to an appropriate journal for publication.

Total: 72 credits

▲ Concentration in Biopsychology (BP)

The biopsychology concentration focuses on studying the biological substrates of behavior. Core and affiliated faculty in the neuroscience and cognitive programs 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, and movement; and computational models of neural functioning.

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.

Biopsychology 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

and one of the following:

- PSYC 559 - Behavioral Chemistry Credits: 3
- PSYC 556 - Chemistry and the Brain Credits: 3
- PSYC 592 - Special Topics Credits: 3
Two courses (6 credits) chosen from:

Cognitive:

- PSYC 701 - Cognitive Bases of Behavior Credits: 3
- PSYC 766 - Advanced Topics in Sensation and Perception Credits: 3
- PSYC 768 - Advanced Topics in Cognitive Science 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

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

Historical:

- PSYC 705 - Historical and Philosophical Issues in Psychology Credits: 3

Specialized content (15 credits) selected from an approved list, including:

- PSYC 561 - Behavioral Biology of Substance Abuse Credits: 3
- PSYC 592 - Special Topics Credits: 3
- PSYC 702 - Biological Bases of Human Behavior Credits: 3
- BIOL 572 - Human Genetics Credits: 3
- BIOL 583 - General Biochemistry Credits: 4
- CSI 739 - Topics in Bioinformatics Credits: 3

Three semesters of 1-credit research course (3 credits)

- PSYC 897 - Directed Reading and Research Credits: 1-3

Third year research project (3 credits) chosen from:
• PSYC 897 - Directed Reading and Research Credits: 1-3
• PSYC 798 - Thesis Proposal Credits: 1-6
• PSYC 799 - Master's Thesis Credits: 1-6

Quantitative and research methods (8 credits):

• PSYC 611 - Advanced Statistics Credits: 4
• PSYC 612 - Advanced Statistics Credits: 4

Quantitative or research methods (6 credits):

at least 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 766 - Advanced Topics in Sensation and Perception Credits: 3

Neuroscience seminars (2 credits):

• NEUR 709 - Neuroscience@GMU Seminars Credits: 1
  and 1 credit of:
• PSYC 890 - Seminar in Professional Psychology Credits: 1-3

Elective credits

Students can complete the 72 credit requirement through credits of additional coursework, research, or seminar.

Dissertation (12 credits):

• PSYC 998 - Doctoral Dissertation Proposal Credits: variable
• PSYC 999 - Doctoral Dissertation Credits: variable

Total: 72 credits

▲ Concentration in Clinical Psychology (CLN)

The clinical psychology concentration is committed to the scientist–practitioner model. The goal of the program 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 community perspectives. A social psychological approach uses theory and research from social psychology to understand emotional, cognitive, behavioral, and interpersonal functioning. A community approach stresses the impact of social and cultural factors on the individual and the impact of the individual on the community. Most of the faculty members employ cognitive–behavioral and interpersonal approaches to research and clinical practice.

Students pursuing this concentration must complete 72 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 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

**Thirteen required courses (45 credits):**

- PSYC 611 - Advanced Statistics Credits: 4
- PSYC 612 - Advanced Statistics Credits: 4
- 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 823 - Scientific Foundations of Clinical Psychology II Credits: 3
- PSYC 830 - History, Systems, and Theories of Personality and Psychotherapy Credits: 3
- PSYC 831 - Social-Cognitive Interventions in Clinical Psychology Credits: 3
- PSYC 833 - Social And Cognitive Foundations Of Clinical Psychology Credits: 3
- PSYC 840 - Community Psychology I Credits: 3
- PSYC 841 - Community Psychology II Credits: 3
- PSYC 881 - Practicum in Clinical Psychology Credits: 3
- PSYC 890 - Seminar in Professional Psychology Credits: 1-3

**Three elective courses (9 credits)**

- Must be approved by advisor

**Dissertation (12 credits):**

At least 3 credits of each.

- PSYC 998 - Doctoral Dissertation Proposal Credits: variable
• PSYC 999 - Doctoral Dissertation Credits: variable

Internship

• Full-time, 12-month clinical psychology internship at a site accredited by the American Psychological Association

Externship (optional, but recommended)

• Part-time clinical psychology externship in the third or fourth year of the program

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 766 - Advanced Topics in Sensation and Perception Credits: 3
• PSYC 768 - Advanced Topics in Cognitive Science Credits: 3

Two core courses (6 credits) chosen from:

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

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

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

Three courses (9 credits) of additional specialized content including:

- PSYC 734 - Seminar in Human Factors and Applied Cognition Credits: 3
- PSYC 737 - Psychology of Human-Technology Interaction Credits: 3
- PSYC 766 - Advanced Topics in Sensation and Perception 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

Dissertation (12 credits):

- PSYC 998 - Doctoral Dissertation Proposal Credits: variable
- PSYC 999 - Doctoral Dissertation Credits: variable
Options:

To reach the 72 credits required for the PhD, students may repeat 734, 737, 766, or 768, or they may take 3 to 6 credits of practicum (PSYC 730) with permission of the advisor. (Students who do not have work experience in applied cognition or human factors are encouraged to take up to 6 credits of practicum.)

- PSYC 734 - Seminar in Human Factors and Applied Cognition Credits: 3
- PSYC 737 - Psychology of Human-Technology Interaction Credits: 3
- PSYC 766 - Advanced Topics in Sensation and Perception Credits: 3
- PSYC 768 - Advanced Topics in Cognitive Science Credits: 3
- PSYC 730 - Practicum in Applied Psychology Credits: 1-6

Notes:

Students are to take credits in PSYC 897 each semester. Students are strongly encouraged to develop competence in programming and computer science through course work or independent study.

Students are encouraged to identify and take relevant courses within or outside the department (with advisor’s approval).

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 74 graduate credits.

Three courses (9 credits) of core chosen from:

One course from each core

Cognitive:

- PSYC 701 - Cognitive Bases of Behavior Credits: 3
- PSYC 759 - Applied Decision Making Credits: 3
- PSYC 766 - Advanced Topics in Sensation and Perception Credits: 3
- PSYC 768 - Advanced Topics in Cognitive Science 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

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 quantitative and research methods:

• PSYC 557 - Psychometric Methods 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

Six courses (18 credits) of specialized content:

• PSYC 636 - Survey of Industrial Psychology Credits: 3
• PSYC 639 - Survey of Organizational Processes Credits: 3

and 6 credits chosen from:

• PSYC 631 - Industrial and Personnel Testing and Evaluation Credits: 3
• 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 736 - Research in Human Performance Assessment Credits: 3
• PSYC 592 - Special Topics Credits: 3
• PSYC 892 - Special Topics in Psychology Credits: 3

and 6 credits chosen from:

• PSYC 667 - Behavior in Small Groups and Teams Credits: 3
• PSYC 735 - Psychological Perspectives on Organizational Development Credits: 3
• PSYC 739 - Seminar in Industrial/Organizational Psychology Credits: 3
• PSYC 741 - Psychology of Work Motivation Credits: 3
• PSYC 592 - Special Topics Credits: 3
• PSYC 892 - Special Topics in Psychology Credits: 3
One course (3 credits) of special topics in professional issues:

- PSYC 890 - Seminar in Professional Psychology Credits: 1-3

Three elective courses (9 credits)

- Courses can be from outside the department with advisor approval

Practicum (6 credits):

- PSYC 730 - Practicum in Applied Psychology Credits: 1-6

Dissertation (12 credits):

- PSYC 998 - Doctoral Dissertation Proposal Credits: variable
- PSYC 999 - Doctoral Dissertation Credits: variable

Total: 74 credits

■ Public and International Affairs

Phone: 703-993-1400
Web: pia.gmu.edu

Faculty

Robinson Professors: Heclo, Paden

Emeritus faculty: Brown, Clark, Early, Gortner, Hart-Nibbrig, Knight, White

Professors: Abramson, Cioffi-Revilla, Conant, Conlan, Druckman, Dudley (chair), Katz, Posner, Regan, Sockett, Wan, Wilsford

Associate professors: Balint, Burt, Dueck, Hackler, Harbour, Lukacs, Mahler, Mandaville, McDonald, McFerson, Miller, Nguyen, Sacco, Snyder-Hall, Toepler, Travis

Assistant professors: Benjamin, Bowie, Brigety, Haddad, Koblentz, Lopez-Santana, Ouagrham-Gormley, Robbins

Term assistant professors: Burroughs, Palubinskas, Walker


Affiliate faculty: Bushee, Casamayou, Connolly, Edner, Shogan
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 and nonprofit management, computer applications, and business administration.

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 GPA of at least 3.00.

Minors

The department offers minors in American government, international/comparative studies, legal studies, and public policy and management. In addition, it coordinates the Asia-Pacific Studies Minor, Global Systems Minor, and Urban and Suburban Studies Minor and participates with the Philosophy Department in the Political Philosophy Minor. See the Interdisciplinary Minors section in this chapter for descriptions of these minors.

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. They offer a master's 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, publica and nonprofit finance, state and local government, or third-party governance.

Funding
The department offers 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.

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

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

In addition to satisfying university general education requirements and the requirements for a bachelor of arts degree in the College of Humanities and Social Sciences, students pursuing this degree must complete 43 credits in GOVT. Students must earn a minimum grade of 2.00 in each course applied to the major. Up to 3 credits of GOVT 480 and 6 credits of GOVT 496 may be substituted for the requirements for the major with prior written approval of the undergraduate director.

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

Eight advanced government field courses (24 credits)
Students must take at least one course (3 credits) in each of the four government fields. Up to 9 credits of GOVT 480 and 496 may be substituted for government field courses with prior written approval of the undergraduate director. GOVT 490 may not be used to fulfill a government field requirement.

**American politics:**

- GOVT 301 - Public Law and the Judicial Process 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 349 - Issues in the Analysis of Global Systems Credits: 1-3
• 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

Public policy and administration:

• GOVT 351 - Administration in the Political System 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 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

One senior seminar course (3 credits):

• GOVT 490 - Synthesis Seminar Credits: 3
• GOVT 491 - Honors Seminar Credits: 3
Concentrations

Students may choose to concentrate in one of the four advanced government fields by completing five courses in that field. They must still take one course (3 credits) in each of the other three fields. GOVT 490 may not be used to fulfill a requirement for a concentration.

▲ Concentration in American Politics (AMP)

Five courses (15 credits) chosen from:

- GOVT 301–319
- GOVT 401–419

▲ Concentration in Political Theory and Law (PTL)

Five courses (15 credits) chosen from:

- GOVT 320–329
- GOVT 420–429
- GOVT 446
- GOVT 470–472

▲ Concentration in International and Comparative Politics (ICOM)

Five courses (15 credits) chosen from:

- GOVT 330–349
- GOVT 430–449

▲ Concentration in Public Policy and Administration (PPA)

Five courses (15 credits) chosen from:

- GOVT 350–369
- GOVT 450–469

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 government and international politics may fulfill this requirement by successfully completing the 300-level GOVT courses in their major.

Public Administration, BS

Banner Code: LA-BS-PUAD
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

In addition to satisfying university general education requirements and the requirements for a bachelor of science degree in the College of Humanities and Social Sciences, students majoring in public administration must complete the coursework below.

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 used to fulfill the requirements below. Only 3 credits of GOVT 480 may be substituted for a major requirement. STAT 250, GOVT 343, GOVT 358, and GOVT 464 may be applied to only one major requirement. With careful planning, some courses required for the major may also fulfill university general education requirements. See an advisor before registering.

Six core courses (19 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
  or
- GOVT 133 - Introduction to Comparative Politics Credits: 3
- GOVT 300 - Research Methods and Analysis Credits: 4
- GOVT 304 - American State and Local Government Credits: 3
- GOVT 351 - Administration in the Political System Credits: 3

Two required advanced government courses (6 credits):

- GOVT 355 - Public Personnel Administration Credits: 3
- GOVT 356 - Public Budgeting and Finance Credits: 3

One advanced government course (minimum 3 credits) chosen from:

- GOVT 357 - Urban Governance and Planning Credits: 3
- GOVT 358 - Nonprofit Financial Planning Credits: 4
- GOVT 452 - Administrative Law and Procedures Credits: 3
- GOVT 464 - Issues in Public Policy and Administration Credits: 1-3
- NCLC 331 - The Nonprofit Sector Credits: 4

Four elective advanced government courses (12 credits) chosen from:

- 3 credits from GOVT 320s or 420s
- 3 credits from GOVT 360s or 460s
- 3 credits of upper-level GOVT taken outside of GOVT 350s and 450s (may include GOVT 480 or 496)

One senior seminar course (3 credits):

- GOVT 490 - Synthesis Seminar Credits: 3
- GOVT 491 - Honors Seminar Credits: 3

Two courses in analytical skills (minimum 6 credits) chosen from:

- OM 210 - Statistical Analysis for Management Credits: 4
- OM 301 - Operations Management Credits: 3
- STAT 250 - Introductory Statistics I Credits: 3
- STAT 350 - Introductory Statistics II Credits: 3
- SOCI 313 - Statistics for the Behavioral Sciences Credits: 4
- MATH 106 - Quantitative Reasoning Credits: 3
- MATH 108 - Introductory Calculus with Business Applications Credits: 3
- MATH 110 - Introductory Probability and Statistics 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

Three courses (9 credits):

- ECON 103 - Contemporary Microeconomic Principles Credits: 3
- ECON 104 - Contemporary Macroeconomic Principles Credits: 3

and one upper-level course chosen from:

- courses in economics (ECON)
- courses in finance (FNAN)
- GOVT 343 - International Political Economy Credits: 3

One course (minimum 3 credits) chosen from:

- courses in accounting (ACCT)
- GOVT 358 - Nonprofit Financial Planning Credits: 4

Courses in information technology (9 credits) or foreign language (up to 12 credits):
Information technology:

- courses in computer science (CS)
- courses in information systems (INFS)
- courses in information technology (IT)
- courses in management information systems (MIS)
- GOVT 359 - Computers in Public Management Credits: 3
- STAT 362 - Introduction to Computer Statistical Packages Credits: 3
- SOCI 405 - Analysis of Social Data Credits: 4

Foreign language:

- One modern foreign language through the intermediate level. At Mason this is equivalent to successful completion of a foreign language course numbered 210.

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 public administration may fulfill this requirement by successfully completing the 300-level GOVT courses in their major programs.

Undergraduate Minor

American Government Minor

Banner Code: AMGV

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 GOVT 301–309 political institutions
Any GOVT 310–319 political behavior
Any GOVT 409–420
GOVT 480 - Internship, when relevant, with prior written approval of the undergraduate director
GOVT 344 - American Foreign Policy Credits: 3

Total: 18 credits

International/Comparative Studies Minor

Banner Code:  ICS

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:

- 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, when relevant, with the prior written approval of the undergraduate director
- GOVT 103 - Introduction to American Government Credits: 3

Total: 18 credits

Legal Studies Minor
Banner Code: LGLS

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 the list below

GOVT 480 - Internship, when relevant, may be used to partially meet this requirement with prior written approval of the undergraduate director.

- 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

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 undergraduate director

Total: 18 credits

Bachelor's/Accelerated Master's Program

Government and International Politics, BA/Political Science, Accelerated MA

Highly qualified undergraduates may apply to the accelerated master's degree program and obtain both the BA in government and international politics and MA in political science after satisfactory completion of 150 credits. Well-prepared undergraduates are encouraged to apply as they near completion of 90 credits. Admitted students are able to use up to 6 graduate credits in partial fulfillment of requirements for the undergraduate degree. On completion and conferral of the undergraduate degree with satisfactory performance (3.00 in each course, grade of B or better) in graduate courses, students are given advanced standing in the master’s program. All other master’s degree requirements must be met.

Applicants must have a cumulative GPA of 3.50 or higher and submit an application, two letters of recommendation (preferably from professors), and a résumé. The one-page application can be obtained at the graduate programs office in the Department of Public and International Affairs.

Public Administration, BS/Public Administration, Accelerated MPA

Highly qualified undergraduates may apply to the accelerated master’s degree program and obtain both the BS in public administration and MPA degree after satisfactory completion of 150 credits. Well-prepared undergraduates are encouraged to apply as they near completion of 90 credits. Admitted students are able to use up to 6 graduate credits in partial fulfillment of
requirements for the undergraduate degree. On completion and conferral of the undergraduate degree with satisfactory performance (3.00 in each course, grade of B or better) in graduate courses, students are given advanced standing in the master’s program. All other master’s degree requirements must be met.

Applicants must have a cumulative GPA of 3.40 or higher and submit an application, two letters of recommendation (preferably from professors), and a résumé. The one-page application can be obtained at the graduate programs office in the Department of Public and International Affairs.

**Master's Degree**

**Biodefense, MS**

*Banner Code: LA-MS-BIOD*

The master's degree in biodefense prepares students to become the next generation of biodefense and biosecurity professionals and scholars. Our unique 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**

Students must meet the admission standards and application requirements of the university. See the Graduate Admission Policies section of the catalog. Because of the breadth of the program, students with backgrounds in science or other areas, such as international affairs, political science, law, public policy, and conflict resolution, are encouraged to apply. In addition to fulfilling the admission requirements for graduate study, applicants must submit:

- Three letters of recommendation from faculty members or individuals who have firsthand knowledge of the applicant’s academic or professional capabilities
- A statement of purpose consistent with research interests or professional goals
- A current resume
- Scores from GRE taken within five years prior to date of application

**Degree Requirements**

Students pursuing the master's degree in biodefense must successfully complete 37 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 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.

**Seven core courses (19 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: 1-4
- BIOD 702 - Biodefense Colloquium Credits: 1
- PUAD 630 - Emergency Planning and Preparedness Credits: 3
- GOVT 500 - Research Methods in Political Science Credits: 3
- GOVT 540 - International Relations Credits: 3

Four to five elective courses (12-15 credits)

At least 9 credits of electives must be in biodefense. Up to 6 credits of non biodefense courses may be used to fulfill this requirement with prior written approval of the director. Students may choose to focus 12 of the 15 elective credits in one of the concentrations below. Students who chose a concentration and a project have 3 additional elective credits; students who choose a concentration and a thesis have no additional elective credits.

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.

- BIOD 798 - Master's Research Project in Biodefense Credits: 3
- BIOD 799 - Master's Thesis in Biodefense Credits: 1-6

Concentrations

Students have the option of completing one of the 12-credit 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 761 - Dispersal Patterns of Biological Agents 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
• 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
• PHIL 642 - Biomedical Ethics 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
• BIOD 760 - National Security Technology and Policy Credits: 3
• BIOD 761 - Dispersal Patterns of Biological Agents Credits: 3
• GOVT 641 - Seminar in Global Systems Credits: 3
• GOVT 741 - Advanced Seminar in International Politics Credits: 3
• GOVT 745 - International Security 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

Political Science, MA

Banner Code: LA-MA-POS

This 36-credit degree 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

Admission is in the fall and spring. Late applications are considered on a space-available basis. In addition to university graduate application requirements, applicants to the master’s in political science should submit three letters of recommendation, preferably from recent professors; GRE scores; résumé listing employment and volunteer work; and a statement of interests and career goals. A writing sample is strongly recommended.

Degree Requirements

Students pursuing the master’s degree in political science must complete 36 credits.

Course work from other departments maybe selected to complement the student's chosen field of specialization and should reflect the ideas, institutions, or processes of contemporary governance. Courses should be approved in an education plan designed by students and their advisor. Students who wish to begin or alter their career 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

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) chosen from:

- 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)

Two courses (6 credits) of methods:

- GOVT 500 - Research Methods in Political Science Credits: 3
- GOVT 711 - Problem Solving and Data Analysis I Credits: 3

Up to three elective courses (9 credits)

Remaining credits required for the degree, if any, are chosen from other courses in the department, including an internship or additional courses in the field of specialization, or from course work offered by other departments.

3 credits of project or 6 credits of thesis

3 credits of GOVT 798 may be linked to an advanced specialty course to produce a final research project. If the thesis option is chosen, a thesis director and a committee of two additional faculty members 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
  or
- 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

Banner Code: LA-MPA-PUAD

This 36-credit program is designed to build the knowledge base and skills of people who are playing or intend to play a leadership role in organizations that develop or implement public policy. In addition, the 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

Students are admitted for fall or spring semesters. Late applications are considered on a space-available basis. In addition to the graduate application requirements specified in the Admission chapter of the catalog, students should submit three letters of recommendation; test scores from the GRE, GMAT, or LSAT; a résumé listing work experience and volunteer activity, and a statement of professional goals. Applicants may petition the Admissions Committee by letter to waive the exam if they have a master’s degree or an undergraduate cumulative GPA of 3.30 or above from a U.S. institution of higher education. Students who want to be considered for an assistantship must submit a GRE score.

Transfer of Credits

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 Program director and the dean. Students who enroll initially through nondegree studies should submit their application to the MPA Program in the first semester of study. Only 9 credits taken in nondegree status may be transferred to the degree program.
Degree Requirements

To receive an MPA, students must successfully complete 36 credits. 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.

Six core courses (18 credits):

- PUAD 502 - Administration in Public and Nonprofit Organizations Credits: 3
- PUAD 611 - Problem Solving and Data Analysis I Credits: 3
- PUAD 620 - Organization Theory and Management Behavior Credits: 3
- PUAD 640 - 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 741 - Policy Analysis Credits: 3
- PUAD 742 - 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)

Colloquium in public administration

Students are required to enroll at least twice in PUAD 798 in two different semesters.

- PUAD 798 - Colloquium in Public Administration Credits: 0

Total: 36 credits
Concentrations

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. 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 MPA director. Other courses may also be applied to a concentration with prior written approval of the director.

▲ 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
- JLCP 509 - Justice Organizations and Processes Credits: 3
- JLCP 510 - Policing in a Democratic Society Credits: 3
- JLCP 691 - Justice Program Planning and Implementation Credits: 3
- JLCP 740 - Justice Organization and Administration Credits: 3
- JLCP 741 - Conduct of Justice Organizations at the Street Level Credits: 3
- JLCP 742 - Leadership in Justice and Security Organizations Credits: 3
- JLCP 743 - Changing Justice and Security Organizations Credits: 3
- JLCP 749 - Issues in Justice Administration Credits: 1-3
- JLCP 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: 36 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 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: 1-3
• 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: 36 credits

▲ Concentration in Environmental Science and Public Policy (EVPP)

One required course (3 credits):

• PUAD 642 - Environmental Policy Credits: 3

Three elective courses (9 credits) chosen from:

• PUAD 741 - Policy Analysis Credits: 3 (if not already taken to meet core requirements)
• PUAD 742 - Program Evaluation Credits: 3 (if not already taken to meet core requirements)
• 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

Note:
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 MPA director.

Total: 36 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: 1-3
• PUAD 730 - Professional Development Workshop Credits: 1-3
• PSYC 631 - Industrial and Personnel Testing and Evaluation Credits: 3
• PSYC 638 - Training: Psychological Contributions to Theory, Design, and Evaluation Credits: 3
• PSYC 639 - Survey of Organizational Processes Credits: 3
• PSYC 640 - Techniques in Industrial/Organizational Psychology Credits: 3
• PSYC 667 - Behavior in Small Groups and Teams Credits: 3

Total: 36 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: 1-3
• PUAD 730 - Professional Development Workshop Credits: 1-3
• PUAD 738 - Issues in International Security Credits: 1-3
• PUAD 739 - Issues in International Management Credits: 1-3
• GOVT 540 - International Relations Credits: 3
• GOVT 631 - Seminar in Comparative Politics and Institutions Credits: 3

Total: 36 credits

▲ Concentration in Nonprofit Management (NPMG)
Two required courses (6 credits):

- PUAD 505 - Introduction to Management of Nonprofits Credits: 1-3
- PUAD 659 - Nonprofit Law, Governance, and Ethics Credits: 3

Two elective courses (6 credits) chosen from:

- PUAD 636 - The NGO: Policy and Management Credits: 1-3
- 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: 36 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 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 741 - Policy Analysis Credits: 3
- PUAD 742 - Program Evaluation Credits: 3
- PUAD 749 - Issues in Public Policy Credits: 1-3
- 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: 36 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 Reforms 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: 1-3
- PUAD 730 - Professional Development Workshop Credits: 1-3
- PUAD 750 - Federalism and Intergovernmental Relations Credits: 3
- PUAD 781 - Information Management: Technology and Policy Credits: 3

Total: 36 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: 1-3
- PUAD 730 - Professional Development Workshop Credits: 1-3
- PUAD 769 - Issues in Public Financial Management Credits: 1-3
Total: 36 credits

▲ Concentration in State and Local Government (SLG)

Four courses (12 credits) chosen from:

- PUAD 505 - Introduction to Management of Nonprofits Credits: 1-3
- 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: 1-3
- PUAD 730 - Professional Development Workshop Credits: 1-3
- PUAD 750 - Federalism and Intergovernmental Relations Credits: 3
- PUAD 759 - Issues in Local Government Administration Credits: 1-3
- PUAD 781 - Information Management: Technology and Policy Credits: 3

Total: 36 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: 1-3
- 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: 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 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 MPA.

Master's Level Certificate

Administration of Justice Graduate Certificate

Banner Code: LA-CERG-ADJ

Students must apply for admission to the certificate program and meet the admission standards and application requirements for all graduate students as stated in the Graduate Admission Policies section of the Admission chapter of the catalog.

This program of study is offered by the Department of Public and International Affairs.

Certificate Requirements

Students pursuing this certificate must complete five courses (15 credits) distributed as follows.

Three required courses (9 credits):

- PUAD 502 - Administration in Public and Nonprofit Organizations Credits: 3
- JLCP 509 - Justice Organizations and Processes Credits: 3
- JLCP 691 - Justice Program Planning and Implementation Credits: 3

Two elective courses (6 credits) in JLCP

Total: 15 credits

Association Management Graduate Certificate

Banner Code: LA-CERG-AM
Students interested in the graduate certificate in association management must apply for admission to the certificate program and meet the admission standards and application requirements for all graduate students as stated in the Graduate Admissions Policies section of the catalog.

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.

Certificate Requirements

Students pursuing this certificate must complete five courses (15 credits) distributed as follows:

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) in the nonprofit area

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-sectoral approaches to long-term prevention of and response to terrorism.

Students must apply for admission to the certificate program and meet the admission standards and application requirements for all graduate students as stated in the Graduate Admissions Policies section of the catalog.

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.

Certificate Requirements

Students pursuing this certificate must complete five courses (15 credits) distributed as follows:

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

Students must apply for admission to the certificate program and meet the admission standards and application requirements for all graduate students as stated in the Admission section of the catalog.

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.

Certificate Requirements

Students pursuing this certificate must complete five courses (15 credits) distributed as follows:

Three required courses (9 credits):

- PUAD 502 - Administration in Public and Nonprofit Organizations Credits: 3
- PUAD 630 - Emergency Planning and Preparedness Credits: 3
- PUAD 632 - Terrorism: Theory and Practice Credits: 3

Two elective courses (6 credits) in the emergency management and homeland security area

Total: 15 credits

Nonprofit Management Graduate Certificate

Banner Code: LA-CERG-NPMG

Students must apply for admission to the certificate program and meet the admission standards and application requirements for all graduate students as stated in the Graduate Admission Policies section of Admission chapter of the catalog.
This certificate is offered in class 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.

Certificate Requirements

Students pursuing this certificate must complete five courses (15 credits) distributed as follows:

Three required courses (9 credits):

- PUAD 505 - Introduction to Management of Nonprofits Credits: 1-3
- PUAD 659 - Nonprofit Law, Governance, and Ethics Credits: 3
- PUAD 664 - Nonprofit Financial Management Credits: 3

Two elective courses (6 credits) in the nonprofit area

Total: 15 credits

Public Management Graduate Certificate

Banner Code: LA-CERG-PMG

Students must apply for admission to the certificate program and meet the admission standards and application requirements for all graduate students as stated in the Graduate Admission Policies section of the Admission chapter of the catalog.

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.

Certificate Requirements

Students pursuing this certificate must complete five courses (15 credits) distributed as follows:

Three required courses (9 credits):

- PUAD 502 - Administration in Public and Nonprofit Organizations Credits: 3
- PUAD 620 - Organization Theory and Management Behavior Credits: 3
- PUAD 640 - Public Policy Process Credits: 3
Two elective courses (6 credits) in the public management area

Total: 15 credits

Doctoral Degree

Biodefense, PhD

Banner Code: LA-PHD-BIOD

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

Students must meet the admission standards and application requirements of the university. See the Graduate Admission Policies section of the catalog. Because of the breadth of the program, students with backgrounds in science and other areas, such as international affairs, political science, law, public policy, and conflict resolution, are encouraged to apply. In addition to fulfilling the admission requirements for graduate study, applicants must submit:

- Three letters of recommendation from faculty members or individuals who have firsthand knowledge of the applicant’s academic or professional capabilities
- A statement of purpose consistent with research interests or professional goals
- A current resume or curriculum vitae
- Scores from GRE taken within five years prior to date of application
- Writing sample such as a full-length research paper

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.

Continuous Registration

Once enrolled in 998, a student must maintain continuous registration in 998 or 999 each semester, except for the summer term, until the dissertation is submitted to and accepted by the University Library.
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

Students pursuing the PhD in biodefense must successfully complete a minimum of 72 graduate 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 required courses (19 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: 1-4
- BIOD 702 - Biodefense Colloquium Credits: 1
- GOVT 540 - International Relations Credits: 3
- GOVT 500 - Research Methods in Political Science Credits: 3
- PUAD 630 - Emergency Planning and Preparedness Credits: 3

One additional advanced research course (3 credits)

Must be approved by the program director. May be focused on qualitative or quantitative research.

Four courses (12 credits) in a 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
- BIOD 761 - Dispersal Patterns of Biological Agents 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

▲ 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 761 - Dispersal Patterns of Biological Agents 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
- 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
- PHIL 642 - Biomedical Ethics Credits: 3

Two courses (6 credits) from the field not chosen as the concentration

Electives

Students complete the remaining 72 credits through additional elective courses chosen in consultation with an advisor.

Dissertation proposal (6 to 9 credits) and research (15-18 credits):

Students must offer a successful public defense of the dissertation proposal before registering for BIOD 999. 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.
A maximum of 24 credits of 998 and 999 may be applied to the degree.

- BIOD 998 - Doctoral Dissertation Proposal Credits: 1-12
- BIOD 999 - Doctoral Dissertation Credits: 1-12

**Political Science, PhD**

**Banner Code: LA-PHD-POS**

The doctoral program 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**

Applications will be accepted for the fall semester only. In addition to university graduate admissions requirements, applicants should submit three letters of recommendation from faculty members or those who can evaluate the applicant’s academic potential, a statement of purpose of study, GRE scores, and a writing sample such as a full-length research paper. Usually, GRE scores up to five years old may be used.

**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**

The degree requires 72 credits of course work divided among core courses, advanced courses in the student’s major and minor fields, supporting courses that can be outside the department, research methods courses, courses in political theory, experiential learning, and dissertation. The program allows students to specialize in two major fields. A total of 12 credits may be taken in other departments to fulfill a minority of the credits for any of the requirements below, including the methodology requirement, with 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

At least seven advanced courses (21 credits) divided between two major fields:

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) chosen from:

- 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
One to three elective courses (3 to 9 credits)

Public administration

Two required field seminars (6 credits) chosen from:

- 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)

At least 3 advanced courses (9 credits) in a minor field

The courses in the minor field are chosen by the student and advisor to complement the two major fields. They require the written approval of the advisor and are included on the student's program of study.

Three advanced methodology courses (9 credits):

The last of the three methodology courses should be tailored to the student’s dissertation research needs. Course work in language or to help achieve proficiency in research techniques (see below) may count as the third methodology course with approval of the program director.

- GOVT 500 - Research Methods in Political Science Credits: 3
- GOVT 711 - Problem Solving and Data Analysis I Credits: 3
- One additional course in quantitative or qualitative methods

Up to 6 credits of 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.

3-6 credits of dissertation proposal

- GOVT 998 - Doctoral Dissertation Proposal Credits: 1-6

15 credits of dissertation research
Doctoral research skills

Students must demonstrate proficiency in the statistical, mathematical, and computational techniques used for political science research or in one foreign language at an advanced level of reading and comprehension. 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.

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.

Continuous Registration

Once enrolled in 998, a student must maintain continuous registration in 998 or 999 each semester until the dissertation is submitted to and accepted by the University Library.

Religious Studies

Phone: 703-993-1290
Web: religious.gmu.edu

Faculty

Associate professors: Burns, M. Dakake, Farina, Nguyen, Rashkover, Ro (chair), Shiner

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.

The department also offers minors in religious studies and Judaic studies, both of which are available to students in all majors.

**Graduate Programs**

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 (MAIS) section of this chapter for details.

**Undergraduate Degree**

**Religious Studies, BA**

**Banner Code: LA-BA-RELI**

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**

In addition to satisfying university general education requirements and the requirements for a bachelor of arts degree in the College of Humanities and Social Sciences, religious studies majors must 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) to the main world religions:**

- RELI 211 - Religions of the Near (Middle) East Credits: 3
• RELI 212 - Religions of the Orient Credits: 3

One seminar (3 credits) taken during the senior year:

Fulfills the university writing-intensive requirement.

• RELI 420 - Seminar Credits: 3

Two courses (6 credits) emphasizing comparative or methodological aspects of the study of religion chosen from the courses below:

RELI 376 - Special Topics in Religious Thought, when relevant, may be used to fulfill this requirement with the prior written approval of the undergraduate director.

• 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

Four courses (12 credits) in religious studies at the 300 and 400 level

Courses should be chosen from religious studies courses other than those used to fulfill the second and third requirements above.

Up to 6 credits of a scriptural language (such as Arabic, Biblical Hebrew, Chinese, Classical Greek, Latin, or Sanskrit) may be used to fulfill this requirement.

Two elective courses (6 credits)

Courses that meet this requirement should be chosen from courses in religious studies or related disciplines (including anthropology, art history, and history) selected in consultation with an advisor.

Up to 6 credits of a scriptural language (such as Arabic, Biblical Hebrew, Chinese, Classical Greek, Latin, or Sanskrit) may be used to fulfill this requirement.

Undergraduate Minor

Judaic Studies Minor

Banner Code: JS

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.

**Three core courses (9 credits):**

- RELI 352 - Judaism from Exile to Talmud Credits: 3
- RELI 370 - Judaism: Life and Thought 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 Near (Middle) East Credits: 3
- RELI 350 - Religion and History of Ancient Israel Credits: 3
- RELI 372 - American Judaism Credits: 3
- RELI 373 - Varieties Of Jewish Expression Credits: 3
- SOCI 450 - The Holocaust: The Construction of Social History through Survivor Testimonies Credits: 3

**Total: 15 credits**

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**Religious Studies Minor**

**Banner Code:** RELI

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 Near (Middle) East Credits: 3
- RELI 212 - Religions of the Orient 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), Vasilyevna-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 Programs

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 (pending SCHEV approval)

Banner Code: LA-BA-REST
This program of study is offered by the Russian and Eurasian Studies Program.

For policies governing all undergraduate degrees, see the Academic Policies chapter of the catalog.

Requirements

In addition to satisfying university general education requirements and the requirements for a bachelor of arts 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 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 Credits: 3
  or
- HIST 328 - Rise of Russia Credits: 3

- RUSS 354 - Contemporary Post-Soviet Life Credits: 3
  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 dealing with Russia

• GOVT 338 - Government and Politics of Russia Credits: 3
• GEOG 330 - Geography of the Soviet Succession States Credits: 3
• ECON 380 - Economies in Transition Credits: 3

Note:
Any topically appropriate course in a social science discipline (ANTH, ECON, GEOG, GOVT, SOCI) may be used to fulfill this requirement with the prior written approval of the director.

▲ 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):

• RUSS 250 - Gateway to Advanced Russian Credits: 3
• RUSS 380 - Advanced Russian I Credits: 3

Note:
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.

Two courses (6 credits) of Russian or Soviet history chosen from:

• HIST 328 - Rise of Russia Credits: 3
• HIST 329 - Modern Russia and the Soviet Union Credits: 3
• HIST 426 - The Russian Revolution Credits: 3

Note:
HIST 300 - Introduction to Historical Method, HIST 388 - Topics in European History, or HIST 499 - Senior Seminar in History, when relevant, may be used to fulfill this requirement with the prior written approval of the director.

Two courses (6 credits) of social sciences dealing primarily with Russia chosen from:
- GOVT 338 - Government and Politics of Russia Credits: 3
- GEOG 330 - Geography of the Soviet Succession States Credits: 3
- ECON 380 - Economies in Transition Credits: 3

Note:

Any topically appropriate courses in any social science discipline (ANTH, ECON, GEOG, GOVT, SOCI) may be used to fulfill this requirement with the prior written approval of the director.

Two courses (6 credits) of Russian literature or culture chosen from:

- 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

Note:

Other relevant courses may be used to fulfill this requirement with the prior written approval of the director.

Three courses at the 300 and 400 level (9 credits) 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
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, GEOG, 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 Eurasian related.

Three courses at the 300- and 400-level (9 credits) that focus predominantly on Eurasia:
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:

- 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
- GEOG 330 - Geography of the Soviet Succession States Credits: 3
- ECON 380 - Economies in Transition Credits: 3
- Any CONF course

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: sociology.gmu.edu
    anthropology.gmu.edu

Faculty

Emeritus faculty: Black, Dumont, Golomb (anthropology); Borkman (sociology)

Professors: Gusterson, Lancaster, Seligmann, Williams (anthropology); Dennis, Haines, Kurtz, Rosenblum, Scimecca (sociology)

Associate professors: Bryant, Palkovich, Snead, Trencher (chair) (anthropology); Best, Guagnano, Hanrahan, Jacobs, Rader (sociology)

Assistant professors: Benitez, Bickford, Mantz (anthropology); Bockman, Dale, Davis, Kim, Samara (sociology)

Term associate professor: Masters (sociology)
Term assistant professors and instructors: Arabandi, Zimmerman (sociology)

Affiliate professors: Avruch (anthropology); Bainbridge, Goldstone, Johnson, Levine, Zingraff (sociology)

Adjuncts: Minnich, Nambiar, Pearlman, Sandole-Staroste

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 may apply to graduate with honors in the major. Eligible students must have completed at least 60 credits, taken ENGL 302 for the social sciences, completed 15 credits of anthropology (including ANTH 114, 120, and 135), and have a minimum cumulative GPA of 3.50 and a minimum GPA of 3.75 in anthropology courses.

To graduate with honors in the major students must successfully complete a sequence of special honors sections: ANTH 492 (for those focusing on sociocultural anthropology) or ANTH 420 (for those interested in archaeology or biological anthropology) both plus ANTH 499, where they conduct additional research leading to the completion of an honors thesis. For more information, contact the anthropology undergraduate director.

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 may apply to graduate with honors in the major. Eligible students must have completed at least 75 credits with a minimum of 15 credits in sociology (6 of which must have been taken at Mason) and have a minimum cumulative GPA of 3.50 and a minimum GPA of 3.75 in sociology courses.

To graduate with honors in sociology, students must complete SOCI 480 and 481 with a minimum GPA of 3.50 overall and in sociology courses presented for graduation. The 6 credits of honors courses may count toward the major requirement in sociology. For more information or application procedures, contact the department.
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 Immigration Studies Minor. See the 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, and cover 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 globalizationsation. 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 a master's and doctoral degree 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, and 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

Anthropology is the study of human beings and their cultures. The bachelor's degree in anthropology 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.

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

In addition to satisfying university general education requirements and requirements for the bachelor of arts 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.

Three core courses (9 credits):

- ANTH 114 - Introduction to Cultural Anthropology Credits: 3
- ANTH 390 - Theories, Methods, and Issues I Credits: 3
- ANTH 490 - Theories, Methods, and Issues II Credits: 3

One course from each of the three fields listed below (9 credits):

Archaeology

- ANTH 120 - Introduction to Archaeology Credits: 3
- ANTH 420 - Interpretation in Archaeology Credits: 3
Biological anthropology

- ANTH 135 - Becoming Human: Evolution, Cognition, and Culture Credits: 3
- ANTH 365 - Race and Racism Credits: 3

Linguistic anthropology

- ANTH 380 - Language and Culture Credits: 3
- LING 326 - General Linguistics Credits: 3

Six elective courses (18 credits):

Students should choose electives from ANTH courses at the 300- and 400-level. SOCI 311 and 313 may be applied toward this requirement. SOCI 311 may substitute for ANTH 390.

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.

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

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

In addition to satisfying university general education requirements and the requirements for a bachelor of arts 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, but students must have a minimum grade of 2.00 in the introductory course and the four core courses.
One introductory core course (3 credits) chosen from:

This course must be completed with a minimum grade of 2.00.

- SOCI 101 - Introductory Sociology Credits: 3
- SOCI 102 - Introduction to Sociological Inquiry Credits: 3

Four additional core courses (14 credits)

Each of these courses must be completed with a minimum grade of 2.00.

- SOCI 303 - Sociological Research Methodology Credits: 4
- SOCI 311 - Classical Sociological Theory Credits: 3
- SOCI 313 - Statistics for the Behavioral Sciences Credits: 4
- SOCI 412 - Contemporary Sociological Theory Credits: 3

Six elective courses (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 have two remaining electives.

Concentrations

Students have the option of completing one of the following 12-credit concentrations.

Students who graduate with honors in sociology may apply 3 credits of honors course work (SOCI 480, 481, 482) 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.

Students pursuing this concentration must complete 12 credits.

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 - Sex and Gender in Contemporary Society Credits: 3
- SOCI 382 - Education in Contemporary Society Credits: 3
- SOCI 395 - Issues 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

▲ Concentration in Culture (CLTR)

This concentration focuses on the social and institutional forces that shape religion, the arts, language, gender, and cultural norms and tastes. It is appropriate for students interested in the media, the arts and popular culture, identity, multiculturalism, and the problems of cultural difference, religion, education, and the construction of knowledge in contemporary societies. Cross-cultural work in this field is encouraged.

Students pursuing this concentration must complete 12 credits.

One required course (3 credits):
- SOCI 314 - Sociology of Culture Credits: 3

Three courses (9 credits) chosen from:
- SOCI 309 - Marriage, Families, and Intimate Life Credits: 3
- SOCI 315 - Sex and Gender in Contemporary Society Credits: 3
- SOCI 332 - Sociology of Urban Communities Credits: 3
- SOCI 355 - Social Inequalities Credits: 3
- SOCI 377 - Art and Society Credits: 3
- SOCI 382 - Education in Contemporary Society Credits: 3
- SOCI 385 - Sociology of Religion Credits: 3
- SOCI 395 - Issues in Sociology Credits: 3
- SOCI 414 - Sociology of Language Credits: 3
- SOCI 505 - Sociology of Sex and Gender Credits: 3
- ANTH 332 - Cultures in Comparative Perspective Credits: 3
- ANTH 488 - Gender, Sexuality, and Culture Credits: 3

▲ 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.

Students pursuing this concentration must complete 12 credits.

One required course (3 credits):
• SOCI 300 - Social Control and Human 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 - Racial and Ethnic Relations Credits: 3
• SOCI 310 - Sociology of Deviance Credits: 3
• SOCI 332 - Sociology of Urban Communities Credits: 3
• SOCI 340 - Power, Politics, and Society Credits: 3
• SOCI 352 - Social Problems Credits: 3
• SOCI 355 - Social Inequalities Credits: 3
• SOCI 395 - Issues in Sociology Credits: 3
• SOCI 402 - Sociology of Punishment and Corrections Credits: 3

▲ 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.

Students pursuing this concentration must complete 12 credits.

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 - Racial and Ethnic Relations Credits: 3
• SOCI 326 - Armed Conflict and Conflict Resolution Credits: 3
• SOCI 332 - Sociology of Urban Communities Credits: 3
• SOCI 340 - Power, Politics, and Society Credits: 3
• SOCI 523 - Racial and Ethnic Relations: American and Selected Global Perspectives Credits: 3
• ANTH 332 - Cultures in Comparative Perspective Credits: 3

▲ 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.

Students pursuing this concentration must complete 12 credits.

**One required course (3 credits):**

- SOCI 355 - Social Inequalities Credits: 3

**Three courses (9 credits) chosen from:**

- SOCI 300 - Social Control and Human Freedom Credits: 3
- SOCI 308 - Racial and Ethnic Relations Credits: 3
- SOCI 310 - Sociology of Deviance Credits: 3
- SOCI 315 - Sex and Gender in Contemporary Society Credits: 3
- SOCI 332 - Sociology of Urban Communities 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 - Issues in Sociology Credits: 3 (depending on topic)
- SOCI 450 - The Holocaust: The Construction of Social History through Survivor Testimonies Credits: 3
- SOCI 523 - Racial and Ethnic Relations: American and Selected Global Perspectives Credits: 3

**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 Minor**

**Anthropology Minor**

**Banner Code:** ANTH

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 21 credits in anthropology with a minimum GPA of 2.00, distributed as follows:

**Four required courses (12 credits):**
• ANTH 114 - Introduction to Cultural Anthropology Credits: 3
• ANTH 120 - Introduction to Archaeology Credits: 3
  or
• ANTH 135 - Becoming Human: Evolution, Cognition, and Culture Credits: 3
• ANTH 332 - Cultures in Comparative Perspective Credits: 3
• ANTH 430 - Research Methods in Archaeology Credits: 3
  or
• ANTH 450 - Qualitative Methods: Nonstatistical Approaches in Culture and Social Research 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 303 - Peoples and Cultures of Selected Regions 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

One topical course (3 credits) chosen from:

• ANTH 300 - Civilizations Credits: 3
• ANTH 305 - Foraging Societies Credits: 3
• ANTH 310 - Social Organization and Kinship Credits: 3
• ANTH 312 - Political Anthropology Credits: 3
• ANTH 313 - Myth, Magic, and Mind Credits: 3
• ANTH 315 - Socialization Processes: Family, Childhood, Personality in Cross-Cultural Perspective Credits: 3
• ANTH 322 - Historical Archaeology Credits: 3
• ANTH 325 - Field Techniques in Archaeology Credits: 3-6
• ANTH 360 - Evolution, Sex, and Society Credits: 3
• ANTH 365 - Race and Racism Credits: 3
• ANTH 370 - Environment and Culture Credits: 3
• ANTH 371 - Psychological Anthropology Credits: 3
• ANTH 375 - Anthropological Perspectives on History Credits: 3
• ANTH 380 - Language and Culture Credits: 3
• ANTH 381 - Health, Healing, and Culture Credits: 3
• ANTH 399 - Issues in Anthropology Credits: 3

One course (3 credits) in anthropology at the 300- or 400-level
Total: 21 credits

Sociology Minor

Banner Code: SOCI

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 21 credits in sociology with a minimum GPA of 2.00 distributed as follows:

Two required courses (6 credits):

- SOCI 101 - Introductory Sociology Credits: 3
- SOCI 311 - Classical Sociological Theory Credits: 3

Five elective courses (15 credits)

- Students may select a focus to their minor from one of the five concentrations offered by the department.

Total: 21 credits

Note:

Academically strong undergraduate majors are encouraged to apply to the accelerated master’s program after they complete 90 credits. Applicants should have a 3.25 GPA, with a 3.50 in sociology courses. If not, they may submit two letters of reference from faculty in the department. For more information, see the sociology graduate coordinator.

Bachelor's/Accelerated Master's Program

Sociology, BA/Sociology, Accelerated MA

Highly qualified undergraduate majors in sociology may apply to the accelerated master’s degree program and obtain both a BA and an MA in sociology following satisfactory completion of 144 credits, sometimes within five years. Well-prepared students are encouraged to apply as they near completion of 90 credits. Admitted students are able to use up to 6 graduate credits in partial fulfillment of requirements for the undergraduate degree. On completion and conferral of the undergraduate degree with
satisfactory graduate-level performance (3.00 in each course, grade of B or better) in graduate courses, students are given advanced standing in the master’s program. All other master’s degree requirements must be met.

Applicants must have a minimum cumulative GPA of 3.25 with a GPA of 3.50 in sociology courses and submit two letters of reference from faculty in the department. Interested students should contact the department for details about the application process.

**Master's Degree**

**Anthropology, MA**

**Banner Code: LA-MA-ANTH**

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; and transnational and global issues. Course work progresses from core courses to more advanced courses and culminates in a thesis.

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**

In addition to fulfilling the applications requirements for graduate study at Mason, applicants for this degree must submit:

- Three letters of recommendation from faculty members or others who can evaluate the applicant’s academic potential. If possible, at least one letter should be from an academic setting.
- 1,000-word writing sample, such as an essay or full-length research paper
- A current résumé

**Degree Requirements**

Students pursuing the master's degree in anthropology must successfully complete 36 credits. They may take ANTH 690 - Internship as elective credit. An internship can serve as a primary field research site for the thesis. Courses in archaeology and biological anthropology may not be used to meet any requirements for the master's degree in anthropology.

**Six required core courses (16 credits):**

- ANTH 535 - Anthropology and the Human Condition: Seminar I Credits: 3
- ANTH 536 - Anthropology and the Human Condition: Seminar II Credits: 3
- ANTH 635 - Regional Ethnography Credits: 3
- ANTH 650 - Ethnographic Methods and Research Design Credits: 3
- ANTH 750 - Ethnographic Genres Credits: 3
- ANTH 797 - Anthropology Colloquium Credits: 1
Five elective courses (14 credits)

Electives should be advanced courses in anthropology chosen in consultation with an advisor. Students can focus their electives around an emphasis in these three areas: advanced training in sociocultural anthropology; culture, health and bioethics; and transnational and global issues. Up to six credits may be from other disciplines with the prior written approval of the graduate director.

Six credits of proposal and thesis

- ANTH 798 - Thesis Proposal Credits: 3-6
- ANTH 799 - Master's Thesis Credits: 1-5

Total: 36 credits

Sociology, MA

Banner Code: LA-MA-SOCI

Students pursuing a master’s degree 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.

The department 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.

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

In addition to meeting general admissions requirements for graduate study, applicants must present the following:

- Minimum of 3 credits each in undergraduate sociological theory, statistics, and research methods. Equivalent courses in other disciplines may be substituted for some of these requirements, with permission.
- Three letters of recommendation from people who have supervised the student’s work. Two should be from an academic setting.
- A written statement (approximately 600 words) explaining the student’s interest in sociology
- Writing sample, such as an essay or full-length research paper
- A current résumé

Degree Requirements
Students pursuing the master's degree in sociology must complete 33 credits.

**Two courses (6 credits) of social theory:**

- SOCI 611 - Classical Sociological Theory Credits: 3
- SOCI 612 - Contemporary Sociological Theory Credits: 3

**Three courses (9 credits) of research methods, including:**

- SOCI 530 - 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 or focus nine credits of electives in one of five emphases.

**Emphasis in Sex and Gender**

- One course (3 credits) in sex and gender
- SOCI 505 - Sociology of Sex and Gender Credits: 3
- SOCI 696 - Independent Study Credits: 3

**Emphasis in Conflict Analysis and Management**

- 9 credits in the sociology of conflict and conflict management

**Emphasis in Race and Ethnicity**

- 9 credits in race and ethnicity

**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.

- a 3-credit master’s-level course 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

Colloquium (0 credits):

• SOCI 797 - Sociology Colloquium Credits: 0

Three or six credits of thesis

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.

• Take 3 or 6 credits of SOCI 799 - Thesis Credits: 1-6

Total: 33 credits

Doctoral Degree

Sociology, PhD

Banner Code: LA-PHD-SOCI

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

See the Application for Graduate Study for admission deadlines. In addition to materials required of all applicants for graduate study at Mason, applicants to the PhD in sociology should submit the following:

• A statement of purpose of academic study
• A writing sample such as a full-length research paper
• Three letters of recommendation from faculty members or those who can evaluate the applicant’s academic potential
• GRE scores (the general test is required; subject tests are optional)

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 the doctorate in sociology must successfully complete a minimum 72 credits.

Nine foundation courses (27 credits)

Two prosemarians (6 credits):
- SOCI 801 - Proseminar in Public and Applied Sociology Credits: 3
- SOCI 802 - Proseminar in Public and Applied Sociology II Credits: 3

Two courses (6 credits) of theory:
- SOCI 711 - Classical Sociological Theory Credits: 3
- SOCI 712 - Contemporary Sociological Theory Credits: 3

Three courses (9 credits) of methodology and analysis chosen from:
- SOCI 620 - Methods and Logic of Social Inquiry Credits: 3
- SOCI 636 - Statistical Reasoning Credits: 3
then
- SOCI 730 - Analytic Techniques of Social Research Credits: 3
or
- SOCI 634 - Qualitative Research Methods Credits: 3

Two courses (6 credits) of statistics/methods courses 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 613 - Ethnography Credits: 3
- ANTH 650 - Ethnographic Methods and Research Design Credits: 3
- WMST 610 - Feminist Approaches to Social Research Credits: 3

Two additional prosemarians (6 credits):
- SOCI 803 - Institutions and Inequality Credits: 3
• SOCI 804 - Sociology of Globalization Credits: 3

Three courses (9 credits) in a specialization

Up to two courses (6 credits) may be from courses that are not in sociology, chosen in consultation with the student’s advisor or the graduate director.

Specialization in institutions and inequalities

• 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 620 - Organization Theory and Management Behavior Credits: 3
• PUAD 640 - Public Policy Process 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
• JLCP 749 - Issues in Justice Administration Credits: 1-3
• WMST 610 - Feminist Approaches to Social Research Credits: 3
• WMST 611 - Gender Research Project Credits: 3

Specialization in sociology of globalization

• SOCI 523 - Racial and Ethnic Relations: American and Selected Global Perspectives Credits: 3
• 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 630 - Anthropology and Humanitarian Action 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

Five courses (15 credits) of electives

Up to two courses (6 credits) may be from courses that are not in sociology, chosen in consultation with the student’s advisor or the graduate director.

15 credits of dissertation proposal and research
Students must complete a minimum of 3 credits of 999.

- SOCI 998 - Doctoral Dissertation Proposal Credits: 1-6
- SOCI 999 - Doctoral Dissertation Credits: 1-12

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. Students in the specialization in sociology of globalization must also demonstrate proficiency in one foreign language at an advanced level of reading and comprehension.

Advancement to Candidacy

To advance to candidacy, doctoral 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 is in the student’s area of specialization, administered by a faculty committee appointed by the graduate program director.

In addition, students must have a dissertation committee appointed by the dean and an approved dissertation proposal. Evidence of the approved proposal must be on file in the Dean’s Office before advancement.

Continuous Registration

Once enrolled in SOCI 998, students must maintain continuous registration for at least 1 credit; once enrolled in 999 students must follow the university continuous registration policy.

Women and Gender Studies

Phone: 703-993-2896
Web: wmst.gmu.edu

Faculty

Amireh, Baker, Beach, Bergoffen, Bernard, Best, Bullard, Burr, Carbonneau, Cattaneo, Censer, Cheldelin, Cherubin, Christensen, Cohen, Constantine, Copelman, Davidson, Davis, Deshmukh, Dunne, Eby, Fischer, Friedley, Fuchs, Fyfe, Gilbert, Gring-Pemble, Hamdani, Hanrahan (director), Harvey, Hodges, Hodzic, Jadallah, Johnsen-Neshati, Jordan, Kaplan, Karametou, King, Kirkland, Kirsch, Koch, Lont, Mann, Masters, Michals, Misencik, Muir, Palkovich, Pascarell, Pawloski, Rabin, Regan, Ricouart, Rosenblum, Samuelian, Sandole-Staroste, Scott, Seligmann, Snyder-Hall, Stearns, Tichy, Todd, Tolchin, Travis, Vivancos Perez, Yocom, Zawacki

Course Work

The Women and Gender Studies Department 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 roles in social, political, cultural, and economic life; gender roles 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 towards 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 able to be applied to the degree. Students must apply and be accepted to a graduate certificate program.

**Women and Gender Studies Center**

The academic program is closely affiliated 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 hosts a library and functions as a community space for students and faculty. It supports the Gender Justice Research Group, a monthly forum for research on gender and global human rights, as well as the Gender Research Project, a methodology class and project focused on gender issues on the Mason campus.

**Undergraduate Interdisciplinary Minor**

**Women and Gender Studies Minor**

**Banner Code: WGST**

This is an interdisciplinary minor open to the entire undergraduate student body.

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 in this minor complete 18 credits with a minimum GPA of 2.00, distributed as follows:

Two required courses (6 credits):

- WMST 200 - Introduction to Women and Gender Studies Credits: 3
- WMST 330 - Feminist Theory Across the Disciplines Credits: 3

Four elective courses (12 credits)

- Chosen from courses in women and gender studies, courses cross-listed with women and gender studies, or course offerings in other departments approved by the director. No more than 6 credits may be taken in any one department.

Total: 18 credits

Master's Level Certificate

Women and Gender Studies Graduate Certificate

Banner Code: LA-CERG-WGST

The certificate may be taken alone or in conjunction with another graduate program. Courses taken toward the certificate may also be used in a degree program, subject to approval of the graduate coordinator in the respective program.

This program of study is offered by the Women and Gender Studies Program.

For policies governing all graduate certificates, see the Academic Policies chapter of this catalog.

Admission

The certificate is open to all students who meet university criteria for admission to graduate study. Students must submit an application for graduate study.

Transfer Credit

Students may transfer up to 3 graduate credits earned at another accredited institution, and 9 graduate credits earned at Mason in nondegree status toward the certificate, subject to approval of the director and the dean and in accordance with university policy.

Certificate Requirements

Students must complete 15 graduate credits and a capstone portfolio. The credits are distributed as follows:

Two required courses (6 credits):
• WMST 630 - Feminist Theories across the Disciplines Credits: 3
• WMST 640 - Women and Global Issues Credits: 3

Three electives (9 credits) chosen from relevant courses with approval of the director:

• These credits may be in 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- to 10-page essay discussing them. Items selected may include course papers, performance videos, photos of exhibits, tapes of music, or other items as agreed on by the student and advisor. The portfolio must be approved by the advisor and submitted to the Women and Gender Studies where it will be presented, displayed, and archived.

Total: 15 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: Cambridge, Freeman, Gilmore, Gorski, Owen

Term assistant professors: Fuertes, Scott, Vitazkova

Adjunct faculty: Bernard, Bruno, Grymes, Holder, Johnson, Saddler, Sweetman, Underwood, Uy-Tioco

Administration

Nance Lucas, Associate Dean
Kelly Dunne, Director of Academic Affairs
Karen Misencik, Director of Experiential Learning
Sarah Sweetman, Director of Student Services
Misty Hensley-McGaffey, 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 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.

Students who enroll in this degree program in their first year at Mason take Mason Cornerstones (see below). All students complete their degree programs with an interdisciplinary concentration. See the programs of study below. Students develop mastery of nine essential competencies (communication, valuing, global understanding, problem solving, group interaction, effective citizenship, aesthetic awareness, critical thinking, and information technology) assessed through freshman and graduation portfolios.

Mason Cornerstones

New Century College offers an interdisciplinary first-year program known as Mason Cornerstones. This is open to students in any major. Cornerstones is a 24-credit program that consists of a sequence of four courses: NCLC 101, 102, 103 and 203.

Students who successfully complete Mason's Cornerstones will have met the university general education requirements in lower-level written communication, oral communication, information technology, literature, arts, non-laboratory natural science, global understanding, and social and behavioral sciences.

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 leadership studies and nonprofit studies. Both are available to students in any major.
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 MAIS section of this chapter for details.

Centers

New Century College houses 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

Integrative Studies, BA

Banner Code: LA-BA-INTS

The bachelor’s 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.

Students who enroll in this degree program their first year of college take Mason Cornerstones. After the first year, students take learning communities, courses that feature experiential learning and faculty-student research addressing fundamental questions. Students complete their degree programs with an interdisciplinary concentration.

The degree program requires mastery of nine essential competencies: communication, valuing, global understanding, problem solving, group interaction, effective citizenship, aesthetic awareness, critical thinking, and information technology. The competencies are assessed through freshman and graduation portfolios.

Students in this degree program meet university general education goals in the following way:

- Completion of Mason Cornerstones: lower-level written communication (ENGL 101), oral communication, information technology, arts, natural science (non laboratory), global understanding, social and behavioral sciences.
- Completion of 24 credits of learning communities: upper-level written communication (ENGL 302), writing intensive course.
- Completion of coursework specifically approved for these requirements (in NCC or in other units): Western civilization or world history, quantitative reasoning, natural science (with laboratory).
- NCLC 491: synthesis.

Students must complete Cornerstones and the 24 credits of learning communities with a minimum GPA of 2.00 in order to be able to use these to fulfill the general education requirements.

Students who transfer into New Century College should consult with an advisor on what they need to take to complete university general education requirements.
This program of study is offered by New Century College.

Students must fulfill all requirements for bachelor's degrees. For policies governing all undergraduate degrees, see the Academic Policies chapter of the catalog.

Degree Requirements

Students pursuing a bachelor’s degree in integrative studies complete 120 credits with at least 24 credits in learning communities, 12 credits of experiential learning, and a concentration of at least 30 credits. Students must present a minimum GPA of 2.00 in the concentration courses, which may include learning communities, experiential learning, independent study, and traditional university courses. All students complete their program of study by producing a final cumulative portfolio and a college senior exposition, completed through NCLC 491.

4 courses (12 credits) of Mason Cornerstones

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 2.0 have fulfilled 3 credits of the general education requirement in written communication (equivalent to ENGL 101).

- NCLC 101 - Narratives of Identity Credits: 6
- NCLC 102 - Global Communities and Networks Credits: 6
- NCLC 103 - Human Creativity: Science and Art Credits: 6
- NCLC 203 - Inquiry for Action: Facilitating Change Credits: 6

At least 24 credits of learning communities

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.

At least 12 credits of experiential learning

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.

Cumulative portfolio

The cumulative portfolio is reviewed by New Century College faculty.
College senior exposition

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

At least 30 credits in a concentration

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 concentration consists of traditional courses, learning communities, independent study, and experiential learning.

Concentration Requirements

▲ Advertising (ADV)

- 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 Credits: 3
  or
- MGMT 301 - Managing 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 - The Internet: Literacy, HTML Tools, and Virtual Community Credits: 3-15
- NCLC 345 - Introduction to Multimedia Credits: 3-15

One course chosen from:

- NCLC 331 - The Nonprofit Sector Credits: 4
- NCLC 350 - Cyberculture Credits: 6
- NCLC 420 - Work Effectiveness Skills Credits: 3-15
- 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 chosen from:
• ACCT 301 - Financial Accounting and Managerial Decision Making Credits: 3
• AVT 104 - Studio Fundamentals I Credits: 4
• AVT 180 - Computers in the Creative Arts Credits: 3
• AVT 280 - Introduction to Digital 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: 1-15
• WMST 100 - Representations of Women Credits: 3
• WMST 304 - Women and Media Credits: 3
• SPMT 412 - Sport Marketing and Finance Credits: 3

Total: minimum 30 credits

▲ Arts and Culture (ACLT)

• NCLC 200 - Visual Thinking and the Creativity Credits: 4
  or
• AVT 371 - Visual Perception and the Arts Credits: 3

• NCLC 245 - Visual Culture and Society Credits: 4

• AVT 307 - Aesthetics Credits: 3
  or
• NCLC 446 - Art, Beauty, and Culture Credits: 3-6

• NCLC 346 - Art as Social Action Credits: 4
  or
• NCLC 347 - Gender Representation in Popular Culture Credits: 3-6

Five courses chosen from:

• AVT 104 - Studio Fundamentals I Credits: 4
• AVT 105 - Studio Fundamentals II Credits: 4
• AVT 222 - Drawing I Credits: 4
• AVT 232 - Painting I Credits: 4
• AVT 262 - Sculpture I Credits: 4
• AVT 280 - Introduction to Digital Arts Credits: 4
• AVT 305 - Creative Processes Credits: 3
• AVT 323 - Drawing II Credits: 4
• AVT 333 - Painting II Credits: 4
• AVT 392 - Gallery Practices Credits: 4
• COMM 157 - Video Workshop Credits: 1
• 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 365 - Women and Media Credits: 3
• COMM 380 - Media Criticism Credits: 3
• COMM 452 - Media Production Practicum Credits: 3
• COMM 456 - Comparative Mass Media Credits: 3
• ENGL 327 - Introduction to Cultural Studies Credits: 3
• ENGL 332 - Introduction to Film Credits: 3
• ENGL 334 - Literary Approaches to Popular Culture Credits: 3
• ENGL 343 - Textual Media Credits: 3
• ENGL 344 - Introduction to Digital Writing in the Genres Credits: 3
• ENGL 493 - Special Topics in Popular Literature Credits: 3
• 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
• NCLC 202 - Public Speaking and Critical Thinking Skills Credits: 4
• NCLC 249 - The Internet: Literacy, HTML Tools, and Virtual Community Credits: 3-15
• NCLC 330 - Enterprise Development Credits: 3-15
• NCLC 331 - The Nonprofit Sector Credits: 4
• NCLC 420 - Work Effectiveness Skills Credits: 3-15
• NCLC 445 - Multimedia Design Credits: 5
• MUSI 301 - Music in Motion Pictures Credits: 3
• PSYC 100 - Basic Concepts in Psychology Credits: 3
• PSYC 211 - Developmental Psychology Credits: 3
• PSYC 313 - Child Psychology Credits: 3
• PSYC 314 - Adolescent Psychology Credits: 3
• PSYC 324 - Personality Theory Credits: 3
• PSYC 325 - Abnormal Psychology Credits: 3

One course chosen from:

• NCLC 244 - Beats, Rhyme, and Culture Credits: 4
• NCLC 304 - Social Movements and Community Activism Credits: 4
• NCLC 305 - Conflict Resolution and Transformation Credits: 6
• NCLC 310 - Violence and Gender Credits: 3-15
• NCLC 312 - Images and Experiences of Childhood: Social Construct, Literature, and Film Credits: 3-15
• NCLC 315 - Spirituality and Conflict Transformation Credits: 6
• NCLC 320 - Construction of Differences: Race, Class, and Gender Credits: 3-15
• NCLC 330 - Enterprise Development Credits: 3-15
• NCLC 331 - The Nonprofit Sector Credits: 4
• NCLC 343 - Interactive Digital Texts Credits: 3
• NCLC 345 - Introduction to Multimedia Credits: 3-15
• NCLC 349 - Writing for Multimedia Credits: 4
• NCLC 350 - Cyberculture Credits: 6
• NCLC 361 - Neighborhood, Community, and Identity Credits: 3-15
• NCLC 381 - When Cultural Worlds Collide Credits: 3-15
• NCLC 445 - Multimedia Design Credits: 5
• NCLC 449 - Multimedia Research and Project Development Credits: 4

Total: minimum 30 credits

▲ Child and Family Studies (CFS)

Eight Studies:

• NCLC 312 - Images and Experiences of Childhood: Social Construct, Literature, and Film Credits: 3-15
• 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
• EDUT 411 - Developmental Pathways of Diverse Learners, Birth-Adolescence Credits: 3
  or
• SOCI 310 - Sociology of Deviance Credits: 3
  or
• SOCI 315 - Sex and Gender in Contemporary Society Credits: 3
• PSYC 415 - Psychological Factors in Aging Credits: 3
  or
• SOCW 435 - An Intergenerational Approach to Aging Credits: 3
  or
• SOCI 441 - The Sociology of Aging Credits: 3

Two courses chosen from:
• Any WMST course
• ANTH 302 - Peoples and Cultures of Latin America Credits: 3
• ADJ 302 - Delinquency Credits: 3
• ANTH 301 - Native North Americans Credits: 3
• ANTH 303 - Peoples and Cultures of Selected Regions 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: 3-15
• NCLC 312 - Images and Experiences of Childhood: Social Construct, Literature, and Film Credits: 3-15
• NCLC 320 - Construction of Differences: Race, Class, and Gender Credits: 3-15
• 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 - Sex and Gender in Contemporary Society Credits: 3
• SOCI 383 - Human Services in Society Credits: 3

Total: minimum 30 credits

▲ Conservation Studies (CNST)

• NCLC 211 - Introduction to Conservation Studies Credits: 6
• NCLC 311 - The Mysteries of Migration: Consequences for Conservation Credits: 3-15
• NCLC 401 - Conservation Biology Credits: 3-15
• EVPP 110 - The Ecosphere: An Introduction to Environmental Science I Credits: 4
• EVPP 111 - The Ecosphere: An Introduction to Environmental Science II Credits: 4

Six courses chosen from:
• ANTH 114 - Introduction to Cultural Anthropology Credits: 3
• ANTH 300 - Civilizations Credits: 3
• ANTH 305 - Foraging Societies Credits: 3
• ANTH 312 - Political Anthropology Credits: 3
• ANTH 370 - Environment and Culture 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 335 - Environmental Economics 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 350 - Freshwater Ecosystems Credits: 4
• GEOG 102 - Physical Geography Credits: 3
• GEOG 301 - Political Geography Credits: 3
• GEOG 303 - Conservation of Resources and Environment Credits: 3
• GEOG 304 - Geography of Population Credits: 3
• GEOG 305 - Economic Geography Credits: 3
• GEOG 306 - Urban Geography Credits: 3
• GEOG 309 - Introduction to Meteorology and Climate Credits: 3
• GEOL 101 - Introductory Geology I Credits: 4
• GEOL 102 - Introductory Geology II Credits: 4
• GEOL 305 - Environmental Geology Credits: 3
• GEOL 309 - Introduction to Oceanography 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 318 - Interest Groups, Lobbying, and the Political Process Credits: 3
• GOVT 351 - Administration in the Political System Credits: 3
• GOVT 357 - Urban Governance and Planning Credits: 3
• GOVT 364 - Public Policy Making Credits: 3
• PRLS 300 - People with Nature Credits: 3
• PRLS 302 - Park Management and Operations Credits: 3
• PRLS 316 - Outdoor Education and Leadership Credits: 3
• PRLS 402 - Human Behavior in Natural Environments Credits: 3

One course chosen from:

• NCLC 220 - Energy and Environment Credits: 3-15
• 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

Total: minimum 30 credits
▲ Elementary Education (ELED)

- 9 credits of ENGL or COMM course work
- 12 credits of natural science
- 3 credits of humanities course work
- 3 credits of U.S. history
- 3 credits of ECON course work
- 3 credits of GEOG course work
- 3 credits of GOVT course work
- 3 credits of HIST course work

12 credits of:

- Any MATH course
- STAT 250 - Introductory Statistics I Credits: 3
  or
- PHIL 173 - Logic and Critical Thinking Credits: 3

Total: minimum 30 credits

▲ Leadership Studies (LEAD)

- NCLC 202 - Public Speaking and Critical Thinking Skills Credits: 4
- NCLC 204 - Leadership Theory and Practice Credits: 3
- NCLC 304 - Social Movements and Community Activism Credits: 4
- NCLC 435 - Leadership in a Changing Environment Credits: 4

Four courses chosen from:

- ACCT 301 - Financial Accounting and Managerial Decision Making Credits: 3
- BULE 302 - Legal Environment of Business Credits: 3
- COMM 202 - Mass Media and Communication Systems Credits: 3
- COMM 230 - Case Studies in Persuasion Credits: 3
- COMM 300 - Foundations of Public Communication Credits: 3
- COMM 320 - Business and Professional Communication Credits: 3
- COMM 330 - Principles of Public Relations Credits: 3
- CS 105 - Computer Ethics and Society Credits: 1
- ENGL 410 - Professional and Technical Writing Credits: 3
- FNAN 301 - Financial Management 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
• GOVT 359 - Computers in Public Management Credits: 3
• MIS 301 - Introduction to Business Information Systems Credits: 3
• 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
• NCLC 249 - The Internet: Literacy, HTML Tools, and Virtual Community Credits: 3-15
• NCLC 305 - Conflict Resolution and Transformation Credits: 6
• NCLC 320 - Construction of Differences: Race, Class, and Gender Credits: 3-15
• NCLC 330 - Enterprise Development Credits: 3-15
• NCLC 331 - The Nonprofit Sector Credits: 4
• NCLC 335 - Ethics, Communication, and Freedom Credits: 3-15
• NCLC 348 - Information in the Digital Age Credits: 6
• NCLC 420 - Work Effectiveness Skills Credits: 3-15
• NCLC 422 - An Experiential Approach to American Foreign Policy Credits: 3-15
• NCLC 423 - Management in the Global Marketplace Credits: 6
• NCLC 431 - Principles of Fund Raising Credits: 4
• PRLS 310 - Program Planning and Design Credits: 3
• PSYC 231 - Social Psychology Credits: 3
• PSYC 324 - Personality Theory Credits: 3
• SOCW 351 - Social Policy and Social Justice I Credits: 3
• SOCW 352 - Social Policy and Social Justice II 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 430 - Tourism on Public Lands Credits: 3
• TOUR 440 - Meetings and Conventions Credits: 3
• TOUR 412 - Tourism and Events Marketing Credits: 3

Total: minimum 30 credits

▲ Information and Society (INSO)

• NCLC 245 - Visual Culture and Society Credits: 4
  or
• NCLC 249 - The Internet: Literacy, HTML Tools, and Virtual Community Credits: 3-15

• COMM 202 - Mass Media and Communication Systems Credits: 3
  or
• AVT 180 - Computers in the Creative Arts Credits: 3
or

- IT 108 - Programming Fundamentals Credits: 3
- IT 304 - IT in the Global Economy Credits: 3
or
- MSOM 302 - Managing Information in a Global Environment Credits: 3
- NCLC 345 - Introduction to Multimedia Credits: 3-15
or
- NCLC 349 - Writing for Multimedia Credits: 4
- NCLC 348 - Information in the Digital Age Credits: 6
- NCLC 350 - Cyberculture Credits: 6

One course chosen from:

- NCLC 343 - Interactive Digital Texts Credits: 3
- NCLC 435 - Leadership in a Changing Environment Credits: 4
- NCLC 445 - Multimedia Design Credits: 5
- NCLC 449 - Multimedia Research and Project Development Credits: 4

Three courses chosen from:

- ANTH 380 - Language and Culture Credits: 3
- ANTH 395 - Work, Technology, and Society: An IT Perspective Credits: 3
- AVT 280 - Introduction to Digital Arts Credits: 4
- AVT 382 - Digital Art and Animation Credits: 4
- AVT 383 - Three-Dimensional Digital Art Credits: 4
- AVT 390 - Digital Media and Video Art Credits: 4
- COMM 303 - Writing across the Media Credits: 3
- COMM 351 - News Writing and Reporting Credits: 3
- COMM 353 - Broadcast Journalism Credits: 3
- COMM 380 - Media Criticism Credits: 3
- COMM 435 - Computers and Communication Credits: 3
- COMM 454 - Free Speech and Ethics Credits: 3
- COMM 455 - History of Print Journalism Credits: 3
- CS 105 - Computer Ethics and Society Credits: 1
- CS 112 - Introduction to Computer Programming Credits: 4
- ENGL 309 - Introduction to Nonfiction Writing Credits: 3
- ENGL 311 - Writing Ethnography Credits: 3
- ENGL 399 - Creative Nonfiction Writing Credits: 3
- ENGL 410 - Professional and Technical Writing Credits: 3
- ENGL 489 - Advanced Nonfiction Writing Credits: 3
- IT 207 - Applied IT Programming Credits: 3
- IT 208 - Program Design and Data Structures Credits: 3
- IT 212 - Computer Hardware Fundamentals Credits: 3
• IT 214 - Database Fundamentals Credits: 3
• IT 223 - Information Security Fundamentals Credits: 3
• IT 314 - Database Management Credits: 3
• IT 353 - Information Defense Technologies Credits: 3
• PHIL 112 - Ethics and the Cybersociety Credits: 1
• PHIL 312 - Philosophy of Technology Credits: 3
• PHIL 373 - Theory of Knowledge Credits: 3
• PSYC 231 - Social Psychology Credits: 3
• PSYC 317 - Cognitive Psychology Credits: 3
• SOCI 304 - Sociology of Work and Occupations Credits: 3
• SOCI 414 - Sociology of Language Credits: 3
• STAT 250 - Introductory Statistics I Credits: 3

Total: minimum 30 credits

▲ International Studies (INST)

• Language competency at the intermediate level required (by course work or examination)
• GOVT 132 - Introduction to International Politics Credits: 3
• GOVT 133 - Introduction to Comparative Politics Credits: 3
• ANTH 114 - Introduction to Cultural Anthropology Credits: 3
  or
• CULT 320 - Globalization and Culture Credits: 3
• GOVT 322 - International Relations Theory Credits: 3
• NCLC 305 - Conflict Resolution and Transformation Credits: 6
  or
• CONF 101 - Conflict and Our World Credits: 3
• NCLC 422 - An Experiential Approach to American Foreign Policy Credits: 3-15
  or
• GOVT 344 - American Foreign Policy Credits: 3
  or
• HIST 345 - History of American Foreign Relations Credits: 3

Five courses chosen from:

• ENGL 404—408
• ENGL 471—474
• ADJ 475 - Theory and Politics of Terrorism Credits: 3
• ANTH 135 - Becoming Human: Evolution, Cognition, and Culture Credits: 3
• ANTH 302 - Peoples and Cultures of Latin America Credits: 3
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<td>Peoples and Cultures of Selected Regions: Non-Western</td>
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<td>High Renaissance Art in Italy</td>
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<td>Baroque Art in Italy, France, and Spain, 1600–1750</td>
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<td>CLAS 260</td>
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<td>Conflict and Our World</td>
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<td>CONF 300</td>
<td>Conflict Resolution Techniques and Practice</td>
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<td>Community, Group, and Organizational Conflict Analysis and Resolution</td>
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• ENGL 336 - Shakespeare Credits: 3
• ENGL 400 - Literature of the Middle Ages Credits: 3
• ENGL 401 - English Poetry and Prose of the 16th Century Credits: 3
• ENGL 402 - English Poetry and Prose of the 17th Century Credits: 3
• ENGL 436 - Nineteenth-Century Continental Novels in Translation Credits: 3
• ENGL 437 - Twentieth-Century Continental Novels in Translation Credits: 3
• ENGL 440 - English Renaissance Drama Credits: 3
• ENGL 443 - Restoration and Eighteenth-Century Drama Credits: 3
• ENGL 445 - English and Irish Drama of the Twentieth Century Credits: 3
• ENGL 450 - English Novel of the 18th Century Credits: 3
• ENGL 453 - English Novel of the 19th Century Credits: 3
• ENGL 456 - English Novel of the Twentieth Century Credits: 3
• ENGL 462 - English Poetry of the Twentieth Century Credits: 3
• ENGL 477 - Special Topics: British Authors Credits: 3
• FREN 325 - Major French Writers Credits: 3
• FREN 329 - Problems of Western Civilization in French Literature Credits: 3
• FREN 451 - Sub-Saharan African Literature Credits: 3
• FREN 453 - Francophone Literature from North Africa Credits: 3
• GEOG 316 - Geography of Latin America Credits: 3
• GEOG 320 - Geography of Europe Credits: 3
• GEOG 325 - Geography of North Africa and the Middle East Credits: 3
• GERM 301 - Culture and Civilization Credits: 3
• GERM 325 - Major Writers 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 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 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 345 - Political Islam Credits: 3
• GOVT 432 - Political Change and Social Development in Sub-Saharan Africa 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 262 - Survey of African Civilization 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 301 - Classical Greece Credits: 3
• HIST 302 - Classical Rome Credits: 3
• HIST 304 - Western Europe in the Middle Ages Credits: 3
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<td>Europe in Crisis: 1914-1948</td>
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<td>Women in Islamic Society</td>
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<td>Marketing in a Global Economy</td>
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• RUSS 354 - Contemporary Post-Soviet Life Credits: 3
• RUSS 407 - Russian Drama and Theater Credits: 3
• RUSS 410 - Russian Poetry Credits: 3
• RELI 212 - Religions of the Orient Credits: 3
• RELI 372 - American Judaism Credits: 3
• RELI 314 - Chinese Philosophies and Religious Traditions Credits: 3
• RELI 315 - The Buddhist Tradition Credits: 3
• RELI 317 - The Daoist Tradition Credits: 3
• RELI 337 - Mysticism: East and West Credits: 3
• RELI 351 - Religions of the Ancient Near East Credits: 3
• RELI 352 - Judaism from Exile to Talmud Credits: 3
• RELI 370 - Judaism: Life and Thought Credits: 3
• RELI 374 - Islamic Thought Credits: 3
• RELI 375 - Qur'an and Hadith Credits: 3
• SOCI 120 - Globalization and Society Credits: 3
• SOCI 308 - Racial and Ethnic Relations 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 450 - The Holocaust: The Construction of Social History through Survivor Testimonies Credits: 3
• SPAN 321 - Introduction to Spanish Culture Credits: 3
• SPAN 322 - Introduction to Latin American Culture Credits: 3
• SPAN 323 - Field Study in Hispanic Culture Credits: 1-3
• SPAN 325 - Major Hispanic Writers Credits: 3
• SPAN 329 - Special Topics in Spanish and Latin American Literature Credits: 3

Total: minimum 30 credits

▲ Language Arts for Education (LAED)

• NCLC 202 - Public Speaking and Critical Thinking Skills Credits: 4
• LING 326 - General Linguistics Credits: 3
• LING 522 - Modern English Grammar Credits: 3

• ENGL 330 - Introduction to Literary Theory Credits: 3
  or
• ENGL 494 - Special Topics in Criticism Credits: 3
  or
• ENGL 495 - Literary Modes Credits: 3

• ENGL 349 - Global Voices Credits: 3
  or
• ENGL 350 - The Idea of a World Literature Credits: 3
or

- ENGL 439 - Literature in English Other Than British and American Credits: 3
- ENGL 309 - Introduction to Nonfiction Writing Credits: 3
- ENGL 396 - Introduction to Creative Writing Credits: 3
- ENGL 410 - Professional and Technical Writing Credits: 3
- ENGL 489 - Advanced Nonfiction Writing Credits: 3

One course chosen from:

- ENGL 335 - Shakespeare Credits: 3
- ENGL 336 - Shakespeare Credits: 3
- ENGL 400 - Literature of the Middle Ages Credits: 3
- ENGL 401 - English Poetry and Prose of the 16th Century Credits: 3
- ENGL 402 - English Poetry and Prose of the 17th Century Credits: 3
- ENGL 404 - The Augustan Age Credits: 3
- ENGL 406 - English Poetry of the Romantic Period Credits: 3
- ENGL 407 - Prose and Poetry of the Victorian Period Credits: 3
- ENGL 408 - Special Topics: British Literary Periods Credits: 3
- ENGL 431 - Medieval Intellectual Topics Credits: 3
- ENGL 440 - English Renaissance Drama Credits: 3
- ENGL 443 - Restoration and Eighteenth-Century Drama Credits: 3
- ENGL 445 - English and Irish Drama of the Twentieth Century Credits: 3
- ENGL 450 - English Novel of the 18th Century Credits: 3
- ENGL 453 - English Novel of the 19th Century Credits: 3
- ENGL 456 - English Novel of the Twentieth Century Credits: 3

One course chosen from:

- ENGL 333 - Folklore of the Americas Credits: 3
- ENGL 368 - Beginnings of African American Literature Through 1865 Credits: 3
- ENGL 371 - African American Literature Through 1946 Credits: 3
- ENGL 372 - Contemporary African American Literature Credits: 3
- ENGL 380 - Recent American Fiction Credits: 3
- ENGL 423 - Colonial and Federalist American Literature Credits: 3
- ENGL 425 - Literature of the American Renaissance Credits: 3
- ENGL 429 - Special Topics: American Literary Periods Credits: 3
- ENGL 447 - American Drama of the Twentieth Century Credits: 3
- ENGL 452 - Development of the American Novel to 1914 Credits: 3
- ENGL 454 - Development of the American Novel since 1914 Credits: 3

One course chosen from:
• NCLC 307 - Narratives of Nature Credits: 6
• NCLC 350 - Cybertulture Credits: 6

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: minimum 30 credits

▲ Legal Studies (LGLS)

• 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 ADJ 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: 3-15
- NCLC 420 - Work Effectiveness Skills Credits: 3-15
- PHIL 111 - Individual and Society Credits: 3
- PHIL 254 - Contemporary Ethical Problems Credits: 3
- PHIL 309 - Bioethics Credits: 3
- SOCI 301 - Criminology Credits: 3
- SOCI 302 - Sociology of Delinquency Credits: 3
- SOCI 402 - Sociology of Punishment and Corrections Credits: 3
- SOCI 471 - Prevention and Deterrence of Crime Credits: 3

Total: minimum 30 credits

▲ Organizational Administration (OADM)

- 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 - Sociology of Work and Occupations Credits: 3
- NCLC 305 - Conflict Resolution and Transformation Credits: 6
  or
- NCLC 420 - Work Effectiveness Skills Credits: 3-15
- MSOM 302 - Managing Information in a Global Environment Credits: 3
  or
- MIS 301 - Introduction to Business Information Systems Credits: 3
  or
- NCLC 348 - Information in the Digital Age 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

One course chosen from:

• MSOM 300 - Managing Financial Resources Credits: 3
• FNAN 301 - Financial Management Credits: 3
• NCLC 431 - Principles of Fund Raising Credits: 4

One course chosen from:

• MSOM 301 - Managing People and Organizations Credits: 3
• MGMT 301 - Managing People and Organizations Credits: 3
• 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 - The Internet: Literacy, HTML Tools, and Virtual Community Credits: 3-15
• NCLC 305 - Conflict Resolution and Transformation Credits: 6
• NCLC 310 - Violence and Gender Credits: 3-15
• NCLC 330 - Enterprise Development Credits: 3-15
• NCLC 331 - The Nonprofit Sector Credits: 4
• NCLC 379 - Cancer and Its Social Impact Credits: 4
• NCLC 410 - Contemporary Health Issues Credits: 3-15
• NCLC 420 - Work Effectiveness Skills Credits: 3-15
• 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 383 - Human Services in Society 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 I Credits: 3
- SOCW 352 - Social Policy and Social Justice II 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 430 - Tourism on Public Lands Credits: 3
- TOUR 412 - Tourism and Events Marketing Credits: 3
- TOUR 440 - Meetings and Conventions Credits: 3

Total: minimum 30 credits

▲ Public and Community Engagement (PCE)

- NCLC 231 - Introduction to Community Studies Credits: 4
- NCLC 304 - Social Movements and Community Activism Credits: 4
  or
- NCLC 346 - Art as Social Action Credits: 4
- NCLC 305 - Conflict Resolution and Transformation Credits: 6
  or
- CONF 101 - Conflict and Our World Credits: 3
- NCLC 320 - Construction of Differences: Race, Class, and Gender Credits: 3-15
  or
- NCLC 361 - Neighborhood, Community, and Identity Credits: 3-15

Five courses chosen from:

- any WMST course
- ADJ 302 - Delinquency Credits: 3
- ADJ 306 - Criminal Justice Ethics Credits: 3
- ADJ 402 - Punishment and Corrections Credits: 3
• ADJ 404 - Crime Victims and Victimization Credits: 3
• ADJ 405 - Law and Justice around the World Credits: 3
• ADJ 406 - Family Law and the Justice System Credits: 3
• ADJ 409 - Community Policing Credits: 3
• ADJ 460 - Surveillance and Privacy in Contemporary Society Credits: 3
• ADJ 471 - Prevention and Deterrence of Crime Credits: 3
• ADJ 475 - Theory and Politics of Terrorism Credits: 3
• ANTH 385 - Gender, Class, and Ethnicity in Latin America Credits: 3
• ANTH 488 - Gender, Sexuality, and Culture Credits: 3
• ARTH 311 - Design of Cities Credits: 3
• ARTH 315 - Modern Architecture Credits: 3
• ARTH 371 - American Architecture and Material Culture Credits: 3
• CONF 101 - Conflict and Our World Credits: 3
• GEOG 304 - Geography of Population Credits: 3
• GEOG 305 - Economic Geography Credits: 3
• GEOG 306 - Urban Geography Credits: 3
• GEOG 315 - Geography of the United States Credits: 3
• GEOG 316 - Geography of Latin America Credits: 3
• GEOG 320 - Geography of Europe Credits: 3
• GEOG 357 - Structures in Urban Governance and Planning Credits: 3
• GEOG 380 - Geography of Virginia Credits: 3
• GEOG 406 - Suburban Geography Credits: 3
• GOVT 351 - Administration in the Political System Credits: 3
• GOVT 358 - Nonprofit Financial Planning Credits: 4
• GOVT 359 - Computers in Public Management Credits: 3
• HEAL 205 - Principles of Accident Causation and Prevention Credits: 4
• HEAL 314 - Community Health Issues and Strategies Credits: 3
• HEAL 323 - Program Leadership and Evaluation 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
• HEAL 370 - Health Determinants and Status 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
• MGMT 301 - Managing People and Organizations Credits: 3
• MSOM 301 - Managing People and Organizations Credits: 3
• MSOM 303 - Marketing in a Global Economy Credits: 3
• NCLC 249 - The Internet: Literacy, HTML Tools, and Virtual Community Credits: 3-15
• NCLC 306 - Our Common Futures Credits: 3-15
• NCLC 310 - Violence and Gender Credits: 3-15
• NCLC 315 - Spirituality and Conflict Transformation Credits: 6
• NCLC 331 - The Nonprofit Sector Credits: 4
• NCLC 340 - Progress: Can America Figure Out What It Means? Credits: 3-15
• NCLC 360 - The Built Environment Credits: 3-15
• NCLC 379 - Cancer and Its Social Impact Credits: 4
• NCLC 410 - Contemporary Health Issues Credits: 3-15
- NCLC 431 - Principles of Fund Raising Credits: 4
- PHED 200 - Professional Dimensions of Health, Recreation, and Physical Education Credits: 3
- PHIL 309 - Bioethics Credits: 3
- PHIL 338 - Woman: The Philosophical Questions Credits: 3
- PRLS 310 - Program Planning and Design 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
- RELI 407 - Women in the World's Religions Credits: 3
- SOCI 301 - Criminology Credits: 3
- 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 - Sex and Gender in Contemporary Society Credits: 3
- SOCI 332 - Sociology of Urban Communities Credits: 3
- SOCI 350 - Community, Diversity, and Democracy: A Practicum Credits: 3
- SOCI 383 - Human Services in Society Credits: 3
- SOCI 390 - Sociology of Health, Illness, and Disability Credits: 3
- SOCI 402 - Sociology of Punishment and Corrections Credits: 3
- SOCI 421 - Field Work in Social Change Credits: 3
- SOCI 441 - The Sociology of Aging Credits: 3
- SOCI 471 - Prevention and Deterrence of Crime Credits: 3
- SOCI 475 - Women and the Law Credits: 3
- SOCW 351 - Social Policy and Social Justice I Credits: 3
- SOCW 352 - Social Policy and Social Justice II Credits: 3
- 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

Total: minimum 30 credits

▲ Social Science for Education (SSED)

- 6 credits of ECON courses
- HIST 120 - U.S. History Credits: 3
  or
- HIST 121 - Formation of the American Republic Credits: 3
- HIST 321 - Early Modern England Credits: 3
  or
- 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: 3-15
- 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: 3-15

9 credits chosen from:
- any GEOG course
- NCLC 340 - Progress: Can America Figure Out What It Means? Credits: 3-15
- NCLC 341 - Progress: Washington, the New Edge City? Credits: 3-15
- NCLC 360 - The Built Environment Credits: 3-15

18 credits chosen from:
- any GOVT course
- NCLC 422 - An Experiential Approach to American Foreign Policy Credits: 3-15

Total: minimum 30 credits

▲ Individualized Concentration (IND)

With approval of the undergraduate director, students may construct an individualized concentration.

Total: minimum 30 credits

Integrative Studies, BS

Banner Codes: LA-BS-INTS
The bachelor’s 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.

Students who enroll in this degree program their first year of college take Mason Cornerstones. After the first year, students take learning communities, courses that feature experiential learning and faculty-student research addressing fundamental questions. Students complete their degree programs with an interdisciplinary concentration.

The degree program requires mastery of nine essential competencies: communication, valuing, global understanding, problem solving, group interaction, effective citizenship, aesthetic awareness, critical thinking, and information technology. The competencies are assessed through freshman and graduation portfolios.

Students in this degree program meet university general education goals in the following way:

- Completion of Mason Cornerstones: lower-level written communication (ENGL 101), oral communication, information technology, arts, natural science (non laboratory), global understanding, social and behavioral sciences
- Completion of 24 credits of learning communities: upper-level written communication (ENGL 302), writing-intensive course
- Completion of coursework specifically approved for these requirements (in NCC or in other units): Western civilization or world history, quantitative reasoning, natural science (with laboratory)
- NCLC 491: synthesis

Students must complete Cornerstones and the 24 credits of learning communities with a minimum GPA of 2.00 in order to be able to use these to fulfill the general education requirements.

Students who transfer into New Century College should consult with an advisor on what they need to take to complete university general education requirements.

This program of study is offered by New Century College.

Students must fulfill all requirements for bachelor's degrees. For policies governing all undergraduate degrees, see the Academic Policies chapter of the catalog.

Degree Requirements

Students pursuing a bachelor’s degree in integrative studies complete 120 credits with at least 24 credits in learning communities, 12 credits of experiential learning, and a concentration of at least 30 credits. Students must present a minimum GPA of 2.00 in the concentration courses, which may include learning communities, experiential learning, independent study, and traditional university courses. All students complete their program of study by producing a final cumulative portfolio and a college senior exposition, completed through NCLC 491.

4 courses (12 credits) of Mason Cornerstones

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 2.0 have fulfilled 3 credits of the general education requirement in written communication (equivalent to ENGL 101).

- NCLC 101 - Narratives of Identity Credits: 6
- NCLC 102 - Global Communities and Networks Credits: 6
- NCLC 103 - Human Creativity: Science and Art Credits: 6
- NCLC 203 - Inquiry for Action: Facilitating Change Credits: 6
At least 24 credits of learning communities

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.

At least 12 credits of experiential learning

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.

Cumulative portfolio

The cumulative portfolio is reviewed by New Century College faculty.

College senior exposition

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

At least 30 credits in a concentration

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 concentration consists of traditional courses, learning communities, independent study, and experiential learning.

Concentration Requirements

▲ Conservation Studies (CNST)

- BIOL 213 - Cell Structure and Function Credits: 4
- BIOL 303 - Animal Biology Credits: 4
- BIOL 304 - Plant Biology Credits: 4
- BIOL 307 - Ecology Credits: 4

- BIOL 311 - General Genetics Credits: 4
  or
- BIOL 377 - Applied Ecology Credits: 3

- GEOG 303 - Conservation of Resources and Environment Credits: 3
- NCLC 211 - Introduction to Conservation Studies Credits: 6
- NCLC 311 - The Mysteries of Migration: Consequences for Conservation Credits: 3-15
- NCLC 401 - Conservation Biology Credits: 3-15
- STAT 250 - Introductory Statistics I Credits: 3

Two courses chosen from:

- ANTH 114 - Introduction to Cultural Anthropology Credits: 3
- ANTH 300 - Civilizations Credits: 3
- ANTH 305 - Foraging Societies Credits: 3
- ANTH 312 - Political Anthropology Credits: 3
- ANTH 370 - Environment and Culture 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 335 - Environmental Economics Credits: 3
- ECON 350 - Regional and Urban Economics Credits: 3
- ECON 360 - Economics of Developing Areas Credits: 3
- 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 336 - Human Dimensions of the Environment Credits: 3
- EVPP 350 - Freshwater Ecosystems Credits: 4
- GEOG 102 - Physical Geography Credits: 3
- GEOG 301 - Political Geography Credits: 3
- GEOG 303 - Conservation of Resources and Environment Credits: 3
- GEOG 304 - Geography of Population Credits: 3
- GEOG 305 - Economic Geography Credits: 3
- GEOG 306 - Urban Geography Credits: 3
- GEOG 308 - Field Mapping Techniques Credits: 3
- GEOG 309 - Introduction to Meteorology and Climate Credits: 3
- GEOL 101 - Introductory Geology I Credits: 4
- GEOL 102 - Introductory Geology II Credits: 4
- GEOL 305 - Environmental Geology Credits: 3
- GEOL 309 - Introduction to Oceanography 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 318 - Interest Groups, Lobbying, and the Political Process Credits: 3
- GOVT 351 - Administration in the Political System Credits: 3
- GOVT 357 - Urban Governance and Planning Credits: 3
- PRLS 300 - People with Nature Credits: 3
- PRLS 302 - Park Management and Operations Credits: 3
- PRLS 316 - Outdoor Education and Leadership Credits: 3
- PRLS 402 - Human Behavior in Natural Environments Credits: 3

One course chosen from:

- NCLC 220 - Energy and Environment Credits: 3-15
- 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 331 - The Nonprofit Sector Credits: 4

Total: minimum 30 credits

▲ Life Sciences (LIFS)

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

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: 3-15
- NCLC 440 - Death, Dying, and Decision Making Credits: 3

Premedical emphasis:
• BIOL 213 - Cell Structure and Function Credits: 4
• BIOL 303 - Animal Biology 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
• CHEM 315 - Organic Chemistry Lab I Credits: 2

• CHEM 314 - Organic Chemistry Credits: 3
• CHEM 318 - Organic Chemistry Lab II Credits: 2

• MATH 110 - Introductory Probability and Statistics 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
• PHYS 244 - College Physics Lab Credits: 1

• PHYS 245 - College Physics Credits: 3
• PHYS 246 - College Physics Lab Credits: 1

• PHIL 151 - Introduction to Ethics Credits: 3
  or
• PHIL 309 - Bioethics Credits: 3

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 Credits: 3
• PHYS 244 - College Physics Lab Credits: 1

• PHYS 104 - Physics and Everyday Phenomena II Credits: 4
  or
• PHYS 245 - College Physics Credits: 3
• PHYS 246 - College Physics Lab Credits: 1

• PHIL 151 - Introduction to Ethics Credits: 3
  or
• PHIL 309 - Bioethics Credits: 3

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
• PHYS 244 - College Physics Lab Credits: 1

• PHYS 104 - Physics and Everyday Phenomena II Credits: 4
  or
• PHYS 245 - College Physics Credits: 3
• PHYS 246 - College Physics Lab Credits: 1

• STAT 250 - Introductory Statistics I Credits: 3

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
• PHYS 244 - College Physics Lab Credits: 1

• PHYS 104 - Physics and Everyday Phenomena II Credits: 4
  or
• PHYS 245 - College Physics Credits: 3
• PHYS 246 - College Physics Lab Credits: 1

• PSYC 211 - Developmental Psychology Credits: 3
  or
• PSYC 325 - Abnormal Psychology Credits: 3

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
Total: minimum 30 credits

▲ Natural Science for Education (NSED)

- Any PHYS course
- 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 course 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 courses chosen from:

- 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
- 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 303 - Animal Biology Credits: 4
- BIOL 304 - Plant Biology Credits: 4
- BIOL 307 - Ecology 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 321 - Elementary Quantitative Analysis Credits: 4
- CHEM 331 - Physical Chemistry I Credits: 3
- CHEM 336 - Physical Chemistry Lab I Credits: 2
- CHEM 332 - Physical Chemistry II Credits: 3
• CHEM 337 - Physical Chemistry Lab II Credits: 2
• CHEM 341 - Fundamental Inorganic Chemistry Credits: 3
• GEOG 102 - Physical Geography Credits: 3
• GEOG 309 - Introduction to Meteorology and Climate Credits: 3
• GEOL 102 - Introductory Geology II Credits: 4
• GEOL 309 - Introduction to Oceanography Credits: 3

Total: minimum 30 credits

▲ Individualized Concentration (IND)

With approval of the undergraduate director, students may construct an individualized concentration.

Total: minimum 30 credits

Undergraduate Minor

Leadership Minor

Banner Code: LSHP

Faculty

Holder, Lucas, Owen

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 in the minor complete at least 15 credits of course work.

Three required core courses (11 credits):
Students complete 4 credits of NCLC 375, when topic is appropriate and approved for the minor.

- NCLC 204 - Leadership Theory and Practice Credits: 3
- NCLC 375 - Special Topics Credits: 3-15
- NCLC 435 - Leadership in a Changing Environment Credits: 4

One course (at least 1 credit) of experiential learning:

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:

- AVT 309 - Art as Social Action Credits: 3
- NCLC 346 - Art as Social Action Credits: 4
- AVT 370 - Entrepreneurship in the Arts Credits: 4
- CONF 300 - Conflict Resolution Techniques and Practice Credits: 3
- CVPA 305 - Seminar in Arts Management Credits: 3
- EDUC 303 - Politics of American Education Credits: 3
- EVPP 361 - Introduction to Environmental Policy Credits: 3
- FNAN 401 - Advanced Financial Management Credits: 3
- GOVT 430 - Comparative Political Leadership Credits: 3
- HEAL 323 - Program Leadership and Evaluation Credits: 3
- NURS 436 - Leadership and Management of Health Care Credits: 3
- IT 304 - IT in the Global Economy Credits: 3
- MGMT 413 - Organizational Development and Management Consulting Credits: 3
- MIS 435 - Knowledge Management Credits: 3
- MKTG 471 - Marketing Management Credits: 3
- MLSC 300 - Applied Leadership I Credits: 1
- MLSC 400 - Leadership and Management Credits: 3
- MLSC 401 - Leadership and Ethics Credits: 3
- MSOM 301 - Managing People and Organizations Credits: 3
- MSOM 302 - Managing Information in a Global Environment Credits: 3
- MSOM 305 - Managing in a Global Economy Credits: 3
- MSOM 306 - Managing Projects and Operations Credits: 3
- PRLS 316 - Outdoor Education and Leadership Credits: 3
- PSYC 231 - Social Psychology Credits: 3
- PSYC 333 - Industrial and Organizational Psychology Credits: 3
- SOCI 307 - Social Movements and Political Protest Credits: 3
- TOUR 330 - Resort Management Credits: 3

Note:
Other courses may be applied to this requirement with prior written approval of the director.

Total: 15 credits

Nonprofit Studies Minor

Banner Code: NPS

Faculty

Benjamin, Sacco, Sweetman (coordinator), Toepler

The nonprofit minor introduces students to the theories and practical realities of working in the American nonprofit or charitable sector. The required course work highlights the historical, legal, and social foundations of nonprofit organizations and their operating characteristics, focusing on such distinctive issues as mission-drive management, earned and unearned revenue, and volunteerism. Elective courses and experiential learning encourage students to explore their professional and/or personal 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 pursuing this minor must complete 16 credits distributed as follows:

Two required courses (8 credits):

- NCLC 331 - The Nonprofit Sector Credits: 4 *
- NCLC 431 - Principles of Fund Raising Credits: 4 *

One course (3 to 4 credits) chosen from:

- GOVT 358 - Nonprofit Financial Planning Credits: 4
- NCLC 435 - Leadership in a Changing Environment Credits: 4
- CONF 101 - Conflict and Our World Credits: 3
- CONF 300 - Conflict Resolution Techniques and Practice Credits: 3
- NCLC 305 - Conflict Resolution and Transformation Credits: 6

Note:

NCLC 375 or 395, when relevant, may fulfill this requirement with prior written approval of the coordinator.
One to two elective courses (3 to 4 credits) chosen from:

- AVT 370 - Entrepreneurship in the Arts Credits: 4
- COMM 300 - Foundations of Public Communication Credits: 3
- COMM 301 - Foundations of Interpersonal Communication Credits: 3
- COMM 335 - Organizational Communication Credits: 3
- CVPA 305 - Seminar in Arts Management Credits: 3
- ECON 309 - Economic Problems and Public Policies Credits: 3
- ENGL 410 - Professional and Technical Writing Credits: 3
- MSOM 301 - Managing People and Organizations Credits: 3
- NCLC 211 - Introduction to Conservation Studies Credits: 6
- NCLC 304 - Social Movements and Community Activism Credits: 4 *
- NCLC 340 - Progress: Can America Figure Out What It Means? Credits: 3-15
- NCLC 349 - Writing for Multimedia Credits: 4
- NCLC 410 - Contemporary Health Issues Credits: 3-15
- NCLC 422 - An Experiential Approach to American Foreign Policy Credits: 3-15
- SOCI 492 - Sociology of Organizations Credits: 3
- SOCW 352 - Social Policy and Social Justice II Credits: 3
- SOCW 483 - Selected Approaches to Social Work Intervention Credits: 3

Note:

NCLC 375 and 390/490* may be used to fulfill this requirement with prior written approval of the coordinator.

Total: 16 credits

Notes:

Each of the required courses is writing intensive with a requirement of at least 3,500 words in logs, essays, and analyses. Writing assignments are aggregated with a cover document at the end of the program into a portfolio that documents the student’s experience in studying the nonprofit world.

* These courses are approved to earn experiential learning credits.
School of Management

Enterprise Hall
Phone: 703-993-1807
Web: som.gmu.edu
College Code: BU

SOM faculty members have research and teaching expertise on topics such as executive compensation, effect of insider trading on stock prices and e-commerce, and international work groups and teams. Faculty members have provided testimony to nearly every federal agency and served as consultants to industry and organizations such as NASDAQ, the Federal Deposit Insurance Corporation, and the Department of Defense.

Today, more than 4,300 students are studying in five undergraduate majors, the business minor, and five graduate programs. SOM’s offerings provide a solid business core that emphasizes information technologies and communication, entrepreneurial thinking, and a global business strategy. We prepare students to lead with initiative, imagination, and innovation. The Mason MBA, Executive MBA, and MS in Technology Management are pioneers nationwide, being among the first graduate business programs to require a global residency program for all graduate business students.

Of all the business programs in the world, only 560 are fully accredited by the Association to Advance Collegiate Schools of Business (AACSB) International. SOM is one of only 168 business schools with both AACSB business and accounting accreditation.

A Mason business degree provides in-depth exposure in an area of specialization, as well as the skills required for success in a global business world. The school’s unique undergraduate keystone and capstone courses develop communication and analytical skills and provide students with opportunities to interact with regional business leaders.

More than 90 percent of the school’s graduate students study while employed, which gives them numerous opportunities to link classroom learning to real-world business challenges. Because our graduate programs emphasize learning in teams, each student has the opportunity to test classroom concepts against the best practices of some of the region’s premier organizations. SOM integrates teamwork, technology, and innovation into a state-of-the-art curriculum to prepare students for tomorrow’s business environment.

Administration

Jorge Haddock, Dean
David J. Harr, Senior Associate Dean
Alison S. O’Brien, Associate Dean, Undergraduate Programs
Angel J. Burgos, Director, MBA Program, MSA Program
Roy W. Hinton, Associate Dean, Executive Programs, and Director, Executive MBA Program
Karen Hallows, Academic Director, Executive MBA Program
Hilda M. Maness, Director, Development
Pamela A. Allen, Assistant Dean, Academic and Career Services

Faculty
Accounting
Aier, Blue, Buchanan, Chen, Dafashy, Douthett, Hasan, Hylton, Jones, Kitching, Lei, Magro, Nutter, Pevzner, Sengupta, Shen, Visvanathan, Warne, Zadeh, Zhang

Finance
Canterbury, Christophe, Crockett, Ferri, Gao, Hanweck, Hsieh, Johnston, Nikolova, Philipov, Stahel, Wang, Xie, Zhdanov

Information Systems and Operations Management
Bockstedt, C. Chen, Das, Druehl, Dutta, Hsu, Hutchison, Mazumdar, Mehta, Menon, Naor, Singer

Management
Coffinberger, Cramton, Cronin, Demory, Joshi, Klimoski, Kravitz, Langfred, C. Lee, H. Lee, Lei, Ling, O’Brien, Parker, Rockmann, Samuels, Wolf, Wolfe, Yasai

Marketing
Cheng, Entrikin, Harvey, Joiner, Jaju, Kulick, Li, Martin, Mcrohan, 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, MSOM, OM, 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 Taxation, and MS in Technology Management. Two graduate certificates are also available in Spatial Business Intelligence and Real Estate 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.

Undergraduate Degree

Accounting, BS
A minimum of 120 credits of course work is required, of which at least 45 credits must be at the 300 or 400 level.

Students should consult the Baccalaureate Degree Requirements section in the Academic Policies chapter in this catalog for information concerning literacy, general education, residency, and other academic requirements.

Degree Requirements

All degree applicants must complete a minimum of 30 credits of SOM core and major courses at Mason. They must include at least 9 credits required for the specific major and SOM 498. A grade of C or higher must be earned in 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.

University General Education

SOM students pursuing a BS degree must complete the university-wide general education program plus 1 additional credit of natural science. The natural science requirement must be fulfilled by completing two 4-credit laboratory sciences.

School of Management General Education

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Acceptance into SOM

A student interested in pursuing a major in accounting, finance, information systems and operations management, management, or marketing must apply for acceptance to SOM during the semester in which the student will complete acceptance requirements. A student who has not received acceptance will have a degree status classified as “BPRE,” until the application is approved.

Acceptance is selective, based on completion of the following:

- At least 48 credits, with a minimum of 9 credits at Mason
- A GPA of 2.50 or higher at the end of the semester of application for acceptance for all courses attempted and from all schools and universities attended
- Successful completion of the following courses with a grade of C or better: ACCT 203 (prerequisite: C or better in ECON 103); OM 210 (prerequisite: C or better in MATH 108); SOM 301 (prerequisite/corequisite: C or better in ACCT 203 and OM 210); MATH 108
- A minimum Mason cumulative and semester GPA of 2.00 at the end of the semester of application

Note: Students must meet the SOM acceptance requirements in effect at the time of application to the school.

Applications must be submitted by November 1 for the following spring semester; April 1 for the following summer term; and July 1 for the following fall semester. Students should file the application at the beginning of the semester in which they anticipate completing the requirements set forth above. For more information about the application process, contact the Office of Academic and Career Services, 703-993-1880, or visit som.gmu.edu.

Major Requirements - BS in Accounting
The BS in accounting (ACCT) prepares students for professional careers in the private and public sectors. Students learn how to evaluate fundamental value propositions for various types of organizations and transactions and convert financial and economic information from these organizations and transactions into information that is useful for making decisions. Students also learn how to design and test information systems that provide reliable and relevant information for planning and control. Furthermore, students learn how to identify value-creating opportunities and choose from among competing operating, investing, financing, and disclosure alternatives to maximize firm or organizational value.

The program emphasizes, but is not limited to, the accounting profession and its role in business and government including professional responsibilities and ethics. The program stresses conceptual understanding, technical competencies, analytic abilities, communication skills, and computer literacy. The accounting degree program is separately accredited by AACSB International.

In addition to general requirements for the BS degree, students must complete all required credits in upper-level accounting courses, with grades of C or better in each course. Students majoring in accounting must complete the following 18 credits. **A grade of B- or higher must be earned in ACCT 301 in order to move on to ACCT 311, 331, and 361.**

**Required Courses:**

- 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.

- 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

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 applicable regulations and meet with their advisor. State regulations regarding professional examinations may dictate course selections.

**Honors in Accounting**

Accounting majors with an A or better in ACCT 301 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 and maintain a minimum GPA of 3.50 in all accounting courses above ACCT 301, earning no grade below a B-.
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 making an appointment or walk-in advising hours, call 703-993-1880, or go to som.gmu.edu.

Finance, BS

Banner Code: BU-BS-FNAN

Associate Dean for Undergraduate Programs
Phone: 703-993-1880
Web: som.gmu.edu

A minimum of 120 credits of course work is required, of which at least 45 credits must be at the 300 or 400 level.

Students should consult the Baccalaureate Degree Requirements section in the Academic Policies chapter in this catalog for information concerning literacy, general education, residency, and other academic requirements.

Degree Requirements

All degree applicants must complete a minimum of 30 credits of SOM core and major courses at Mason. They must include at least 9 credits required for the specific major and SOM 498. A grade of C or higher must be earned in 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.

University General Education 32

SOM students pursuing a BS degree must complete the university-wide general education program plus 1 additional credit of natural science. The natural science requirement must be fulfilled by completing two 4-credit laboratory sciences.

School of Management General Education 15

ECON 103* 3
ECON 104* 3
ECON 300–400 3
ANTH, PSYC, SOCI, or SOM 100 3
MATH 108 or 113* (satisfies university requirement for quantitative reasoning) 3
School of Management Core*  35
ACCT 203  3
ACCT 301  3
BULE 302  3
FNAN 301  3
MGMT 301  3
MIS 102  1
MIS 301  3
MKTG 301  3
OM 210  4
OM 301  3
SOM 301  3
SOM 498  3

Major*  18
See following section for major requirements.

General Electives  20

Total Credits  120

* Completion with a grade of C or better is required for graduation.

Acceptance into SOM

A student interested in pursuing a major in accounting, finance, information systems and operations management, management, or marketing must apply for acceptance to SOM during the semester in which the student will complete acceptance requirements. A student who has not received acceptance will have a degree status classified as “BPRE,” until the application is approved.

Acceptance is selective, based on completion of the following:

- At least 48 credits, with a minimum of 9 credits at Mason
• A GPA of 2.50 or higher at the end of the semester of application for acceptance for all courses attempted and from all schools and universities attended
• Successful completion of the following courses with a grade of C or better: ACCT 203 (prerequisite: C or better in ECON 103); OM 210 (prerequisite: C or better in MATH 108); SOM 301 (prerequisite/corequisite: C or better in ACCT 203 and OM 210); MATH 108
• A minimum Mason cumulative and semester GPA of 2.00 at the end of the semester of application

Note: Students must meet the SOM acceptance requirements in effect at the time of application to the school.

Applications must be submitted by November 1 for the following spring semester; April 1 for the following summer term; and July 1 for the following fall semester. Students should file the application at the beginning of the semester in which they anticipate completing the requirements set forth above. For more information about the application process, contact the Office of Academic and Career Services, 703-993-1880, or visit som.gmu.edu.

Major Requirements - BS in Finance

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. In addition to general degree requirements for the major, students must complete 18 credits in upper-level finance courses with a grade of C or better in each course.

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):

• 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 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
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 making an appointment or walk-in advising hours, call 703-993-1880, or go to som.gmu.edu.

Information Systems and Operations Management, BS

Banner Code: BU-BS-ISOM

Associate Dean for Undergraduate Programs
Phone: 703-993-1880
Web: som.gmu.edu

A minimum of 120 credits of course work is required, of which at least 45 credits must be at the 300 or 400 level.

Students should consult the Baccalaureate Degree Requirements section in the Academic Policies chapter in this catalog for information concerning literacy, general education, residency, and other academic requirements.

Degree Requirements

All degree applicants must complete a minimum of 30 credits of SOM core and major courses at Mason. They must include at least 9 credits required for the specific major and SOM 498. A grade of C or higher must be earned in 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.

University General Education 32

SOM students pursuing a BS degree must complete the university-wide general education program plus 1 additional credit of natural science. The natural science requirement must be fulfilled by completing two 4-credit laboratory sciences.

School of Management General Education 15

ECON 103* 3

ECON 104* 3

ECON 300–400 3

ANTH, PSYC, SOCI, or SOM 100 3

MATH 108 or 113* (satisfies university requirement for quantitative reasoning) 3
School of Management Core*  

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<td>SOM 498</td>
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</tbody>
</table>

Major*  

18

See following section for major requirements.

General Electives  

20

Total Credits  

120

* Completion with a grade of C or better is required for graduation.

Acceptance into SOM

A student interested in pursuing a major in accounting, finance, information systems and operations management, management, or marketing must apply for acceptance to SOM during the semester in which the student will complete acceptance requirements. A student who has not received acceptance will have a degree status classified as “BPRE,” until the application is approved.

Acceptance is selective, based on completion of the following:
• At least 48 credits, with a minimum of 9 credits at Mason
• A GPA of 2.50 or higher at the end of the semester of application for acceptance for all courses attempted and from all schools and universities attended
• Successful completion of the following courses with a grade of C or better: ACCT 203 (prerequisite: C or better in ECON 103); OM 210 (prerequisite: C or better in MATH 108); SOM 301 (prerequisite/corequisite: C or better in ACCT 203 and OM 210); MATH 108
• A minimum Mason cumulative and semester GPA of 2.00 at the end of the semester of application

Note: Students must meet the SOM acceptance requirements in effect at the time of application to the school.

Applications must be submitted by November 1 for the following spring semester; April 1 for the following summer term; and July 1 for the following fall semester. Students should file the application at the beginning of the semester in which they anticipate completing the requirements set forth above. For more information about the application process, contact the Office of Academic and Career Services, 703-993-1880, or visit som.gmu.edu.

Major Requirements - BS in Information Systems and Operations Management

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.

In addition to general degree requirements for the major, students who major in ISOM must complete 18 credits of upper-level ISOM courses with a grade of C or better in each course. Of these, 9 credits in the required courses for the major are listed below. 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.

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):

• 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 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 450 - Internet Architecture and Industry Credits: 3
• MIS 491 - Seminar in Management Information Systems Credits: 3
• MIS 499 - Independent Study in Management Information Systems Credits: 1-3

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 making an appointment or walk-in advising hours, call 703-993-1880, or go to som.gmu.edu.

Management, BS

Banner Code: BU-BS-MGMT

Associate Dean for Undergraduate Programs
Phone: 703-993-1880
Web: som.gmu.edu

A minimum of 120 credits of course work is required, of which at least 45 credits must be at the 300 or 400 level.

Students should consult the Baccalaureate Degree Requirements section in the Academic Policies chapter in this catalog for information concerning literacy, general education, residency, and other academic requirements.

Degree Requirements

All degree applicants must complete a minimum of 30 credits of SOM core and major courses at Mason. They must include at least 9 credits required for the specific major and SOM 498. A grade of C or higher must be earned in 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.

University General Education

SOM students pursuing a BS degree must complete the university-wide general education program plus 1 additional credit of natural science. The natural science requirement must be fulfilled by completing two 4-credit laboratory sciences.

School of Management General Education

ECON 103* 3
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**School of Management Core* 35**

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</table>

**Major* 18**

See following section for major requirements.

**General Electives 20**

**Total Credits 120**

* Completion with a grade of C or better is required for graduation.

**Acceptance into SOM**
A student interested in pursuing a major in accounting, finance, information systems and operations management, management, or marketing must apply for acceptance to SOM during the semester in which the student will complete acceptance requirements. A student who has not received acceptance will have a degree status classified as “BPRE,” until the application is approved.

Acceptance is selective, based on completion of the following:

- At least 48 credits, with a minimum of 9 credits at Mason
- A GPA of 2.50 or higher at the end of the semester of application for acceptance for all courses attempted and from all schools and universities attended
- Successful completion of the following courses with a grade of C or better: ACCT 203 (prerequisite: C or better in ECON 103); OM 210 (prerequisite: C or better in MATH 108); SOM 301 (prerequisite/corequisite: C or better in ACCT 203 and OM 210); MATH 108
- A minimum Mason cumulative and semester GPA of 2.00 at the end of the semester of application

Note: Students must meet the SOM acceptance requirements in effect at the time of application to the school.

Applications must be submitted by November 1 for the following spring semester; April 1 for the following summer term; and July 1 for the following fall semester. Students should file the application at the beginning of the semester in which they anticipate completing the requirements set forth above. For more information about the application process, contact the Office of Academic and Career Services, 703-993-1880, or visit som.gmu.edu.

Major Requirements - BS in Management

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. In addition to general degree requirements for the BS, students must complete 18 credits in upper-level management courses with a grade of C or better in each course.

Required Courses:

- MGMT 312 - Principles and Practices of Management Credits: 3
- MGMT 321 - Introduction to Human Resource Management Credits: 3

Electives (choose four):

- 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 - Employee 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
- 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 - Employee 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, Management Honors Seminar, 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 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.

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 making an appointment or walk-in advising hours, call 703-993-1880, or go to som.gmu.edu.

Marketing, BS

Banner Code: BU-BS-MKTG
A minimum of 120 credits of course work is required, of which at least 45 credits must be at the 300 or 400 level.

Students should consult the Baccalaureate Degree Requirements section in the Academic Policies chapter in this catalog for information concerning literacy, general education, residency, and other academic requirements.

Degree Requirements

All degree applicants must complete a minimum of 30 credits of SOM core and major courses at Mason. They must include at least 9 credits required for the specific major and SOM 498. A grade of C or higher must be earned in 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.

University General Education  
SOM students pursuing a BS degree must complete the university-wide general education program plus 1 additional credit of natural science. The natural science requirement must be fulfilled by completing two 4-credit laboratory sciences.

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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<tbody>
<tr>
<td>ECON 103*</td>
<td>3</td>
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<tr>
<td>ECON 104*</td>
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<tr>
<td>ECON 300–400</td>
<td>3</td>
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<tr>
<td>ANTH, PSYC, SOCI, or SOM 100</td>
<td>3</td>
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<tr>
<td>MATH 108 or 113* (satisfies university requirement for quantitative reasoning)</td>
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School of Management General Education  

School of Management Core*  

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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<tbody>
<tr>
<td>ACCT 203</td>
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<tr>
<td>ACCT 301</td>
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<td>BULE 302</td>
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<td>FNAN 301</td>
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<tr>
<td>MGMT 301</td>
<td>3</td>
</tr>
<tr>
<td>MIS 102</td>
<td>1</td>
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</table>
Acceptance into SOM

A student interested in pursuing a major in accounting, finance, information systems and operations management, management, or marketing must apply for acceptance to SOM during the semester in which the student will complete acceptance requirements. A student who has not received acceptance will have a degree status classified as “BPRE,” until the application is approved.

Acceptance is selective, based on completion of the following:

- At least 48 credits, with a minimum of 9 credits at Mason
- A GPA of 2.50 or higher at the end of the semester of application for acceptance for all courses attempted and from all schools and universities attended
- Successful completion of the following courses with a grade of C or better: ACCT 203 (prerequisite: C or better in ECON 103); OM 210 (prerequisite: C or better in MATH 108); SOM 301 (prerequisite/corequisite: C or better in ACCT 203 and OM 210); MATH 108
- A minimum Mason cumulative and semester GPA of 2.00 at the end of the semester of application

Note: Students must meet the SOM acceptance requirements in effect at the time of application to the school.

Applications must be submitted by November 1 for the following spring semester; April 1 for the following summer term; and July 1 for the following fall semester. Students should file the application at the beginning of the semester in which they anticipate completing the requirements set forth above. For more information about the application process, contact the Office of Academic and Career Services, 703-993-1880, or visit som.gmu.edu.

Major Requirements - BS in Marketing

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. Students must complete 18 credits of upper-level marketing courses with a grade of C or better in each course.

**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):**

- 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 481 - Marketing in the Nonprofit Sector Credits: 3
- MKTG 491 - Special Topics in Marketing Credits: 3
- MKTG 499 - Independent Study Credits: 1-3

**▲ Concentration in Internet Marketing Resiliency (IMR)**

Marketing also offers a concentration in Internet marketing resiliency within the marketing major. This concentration prepares students to enhance and protect the electronic marketing efforts of their firms.

**Required Courses (choose four):**

- MIS 320 - Networks and Security Credits: 3
- MKTG 315 - Internet Marketing Credits: 3
- MKTG 351 - Marketing Research Techniques and Applications Credits: 3
- MKTG 451 - Competitive Intelligence and Information Security Credits: 3
- MKTG 471 - Marketing Management Credits: 3
- MKTG 491 - Special Topics in Marketing Credits: 3

**Academic Advising**
Marketing majors are advised to work closely with their academic advisor to ensure that electives taken in related fields provide
the opportunity to gain proficiency in specific marketing-related areas. 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 making an appointment or walk-in advising hours, call 703-993-1880, or go to
som.gmu.edu.

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 Mason after acceptance to the certificate program. 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 want 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 nonaccounting 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.**

Certificate Requirements

Required Courses:

- 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
- 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 (choose two):

- ACCT 372 - Business Analysis and Valuation Credits: 3
- ACCT 382 - Financial Analysis and the Business Life Cycle 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

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 seven courses. Students must complete five of the seven courses for a total of 15 credits.

*required courses

- MSOM 300 - Managing Financial Resources Credits: 3

*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.
• 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:

(choose one of 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

Notes:

These courses may not be taken for credit by SOM majors, except for MSOM 305, which may be used only 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 6 credits toward the business minor.

Master's Degree

Accounting, MS

Banner Code: BU-MS-ACCT

Phone: 703-993-2136
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 programs allow 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 contact the department for details.

Degree Requirements

Students are responsible for familiarization and compliance with the university's Graduate Policies contained in this catalog.

All MS in accounting students must complete the following 10 courses (3 credits each):

- ACCT 741 - Information Technology Auditing Credits: 3
- ACCT 742 - Corporate Governance and Ethics Credits: 3
- ACCT 743 - Corporate Financial Reporting Credits: 3
- ACCT 744 - Fraud Deterrence and Detection Credits: 3
- MBA 603 - Managerial Economics and Decisions of the Firm 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 701 - Business Analysis and Valuation Credits: 3

Note:

Students must either graduate with an MSA degree on completion of 30 credits or opt into the Mason MBA program.

Business Administration, MBA

Banner Code: BU-MBA-BUAD

Phone: 703-993-2136
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 required 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 March 15. International students have an application deadline of February 1.

**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: 30 credits of core courses and 18 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**

30 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 673 - Legal Environment for Management Credits: 1.5
- MBA 678 - Strategy and Organizational Leadership Credits: 3
- MBA 798 - Global Business Perspectives Credits: 3
  Travel outside the United States is required. Most travel costs are included in the MBA program tuition and fees.

**Total:** 30 credits

**Elective Courses**

After completing the core courses, students must complete a series of market-driven elective courses (18 credits). 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.
MBA students interested in pursuing the Spatial Business Intelligence Graduate Certificate may apply a maximum of 6 credits from the following eligible courses toward the certificate: MBA 603, MBA 623, MBA 638.

Concentrations

MBA students may use electives to complete courses leading to a concentration in accounting, financial management, entrepreneurship, marketing, information systems management, or project management.

▲ Accounting (ACCT)

Required courses

- MBA 741 - Information Technology Auditing Credits: 3
- MBA 742 - Corporate Governance and Ethics Credits: 3
- MBA 743 - Corporate Financial Reporting Credits: 3
- MBA 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

Note:

One elective must be taken outside this concentration to total 18 credits.

▲ Entrepreneurship (ENTR)

Required courses

Choose any four courses from the following list to complete 12 credits.

- 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
Note:

Six credits of MBA 700 level courses must be taken to complete degree requirements.

▲ Financial Management (FM)

Required courses

- MBA 701 - Business Analysis and Valuation Credits: 3
- MBA 702 - Corporate Financial Policy Credits: 3
- MBA 703 - Financial Markets Credits: 3

Two courses from the following:

- 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

Note:

One elective must be taken outside this concentration to total 18 credits.

▲ Information Systems Management (ISM)

Required courses

Choose any four courses from the following list to complete 12 credits.

- MBA 731 - Business Systems Development 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 Management Credits: 3

Note:

Six credits of MBA 700 level courses must be taken to complete degree requirements.

MBA students interested in the Spatial Business Intelligence Graduate Certificate and choosing the ISM concentration may apply a maximum of 6 credits from the following eligible courses towards the certificate: MBA 603, MBA 623, MBA 638,
MBA 731, MBA 735. MBA students with the ISM concentration may use MBA 738 towards the certificate only if it is not used towards either earning the MBA concentration or MBA degree.

▲ 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

Note:

Six credits of MBA 700 level courses must be taken to complete degree requirements.

▲ Project Management (PMGT)

Required courses

- MBA 712 - Project Management Credits: 3
- MBA 715 - Advanced Project and Program Management Credits: 3

Two electives from the following:

- MBA 726 - Negotiations Credits: 3
- MBA 725 - Leadership Credits: 3
- MBA 731 - Business Systems Development Credits: 3
- MBA 737 - Information Technology Governance and Policy Credits: 3

Note:

Six credits of MBA 700 level courses must be taken to complete degree requirements.

Specializations

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.
Executive MBA

Banner Code: BU-MBA-BUEX

Phone: 703-993-4457
Email: emba@gmu.edu

The Executive MBA Program is completed 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.

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 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 Healthcare Financial Services, General Dynamics, HP, IBM, KPMG, Level (3) Communications, Lockheed Martin, ManTech 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.

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 Residencies

Five residency sessions complete the Executive MBA 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—Trip to New York 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—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.

**Degree Requirements**

Successful completion of all coursework and residencies. Students are responsible for familiarization and compliance with the university's Graduate Policies contained in this catalog.

**Program Schedule**

**Eight Modules**

During each of our seven-week modules, 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

**Academic Year I**

**Opening Residency Workshops**

- Building the High Performing Team
- A Strategic View of the Firm

**Courses Year One**
• 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 712 - International Macroeconomics: Concepts and Country Strategy Credits: 1.5
• EMBA 791 - The Regulatory and Business Environment of the European Union Credits: 1.5
• EMBA 798 - International Business Environment Credits: 1-3
(Taken at the end of the first year of the program.)

Academic Year II

Mid Program Residency Workshop

• Executive Leadership and Business Performance Workshop

Courses Year Two

• EMBA 612 - Managing Costs and Evaluating Performance Credits: 1-3
• EMBA 660 - Management of Information Technology Credits: 3
• EMBA 673 - Legal Environment for Management Credits: 1.5
• EMBA 678 - Strategic Management Credits: 3
• EMBA 703 - Financial Markets Credits: 3
(Includes the New York Residency in the fall of the second year.)
• EMBA 716 - Managing Change Credits: 1.5
• EMBA 725 - Leadership Credits: 1.5
• EMBA 735 - Systems Thinking for Business Performance Credits: 1-3
• EMBA 750 - Capstone Project: Action Learning Project Credits: 1.5
• EMBA 751 - Corporate Strategy and Policy Credits: 1.5
• EMBA 791 - The Regulatory and Business Environment of the European Union Credits: 1.5
(Oxford Residency in the spring of the second year.)

And two electives from:

• EMBA 708 - Taxation and Business Strategy Credits: 1-3
• EMBA 715 - Special Topics in Accounting Credits: 1-3
• EMBA 717 - Corporate Governance Credits: 1-3
• EMBA 724 - Marketing Communications Credits: 3
• EMBA 727 - Applied Macroeconomics Credits: 1-3
• EMBA 734 - Electronic Commerce Credits: 1-3
• EMBA 745 - Special Topics in Finance Credits: 1-3
• EMBA 755 - Special Topics in Management Credits: 1-3
• EMBA 765 - Special Topics in Management Information Systems Credits: 1-3
Additional Information

EMBA students interested in the Spatial Business Intelligence Graduate Certificate may apply a maximum of 6 credits from the following eligible courses toward the certificate:

- EMBA 603 - Managerial Economics and the Decisions of the Firm Credits: 3
- EMBA 623 - Marketing Management Credits: 3
- EMBA 638 - Strategies for Operations Management: Process and Supply Chain Leadership Credits: 3

Taxation, MS

Banner Code: BU-MS-TAX

Phone: Professor Anne Magro 703-993-1765
Email: amagro@gmu.edu

The objective of the M.S. in Taxation (MST) program is to provide a comprehensive, high-quality, and professionally oriented education for professionals who have made a career commitment to the field of taxation. It is built on a foundation that assumes an undergraduate degree in business and relevant accounting or taxation experience. The program is not for students who are changing careers or for those seeking an advanced degree solely to qualify for professional certification. Further, the program does not intend to serve full-time students or those who do not possess prior professional experience in accounting or taxation.

Admission Requirements

Students registering for graduate level courses numbered 600 or higher in the School of Management must have graduate standing. Non-degree student status is not available.

Admission to the Masters of Science in Taxation (MST) program is competitive and is based upon three criteria:

1. Professional experience in the fields of taxation or accounting, or licensure as a Certified Public Accountant;
2. Undergraduate academic performance; and
3. Performance on the GMAT

Degree Requirements

The MST program requires a minimum of 30 semester hours of graduate course work. However, students who have not earned a recent undergraduate degree in business administration from an AACSB-accredited school may be required to take additional credits to satisfy the business administration foundation requirements. The exact number of credit hours for an individual is based on an evaluation by the program director at the time of admission.

Students are responsible for familiarization and compliance with the university's Graduate Policies contained in this catalog.

Required Core Courses, 18 hours

Each candidate must complete the following core courses unless, in the opinion of the program director, the candidate has had previous comparable graduate-level course work that would justify substitution of other graduate courses.
Electives, 12 hours

Each student must complete 12 hours of acceptable elective course work including at least 9 credits in taxation selected from the courses listed below. The remaining 3 semester hours may be selected from any 700-level or higher graduate course and must be approved by the program director.

Progress Requirement

To ensure that each student is making satisfactory progress toward completion of his/her degree, each MST student must complete at least 12 credits during the first calendar year of enrollment and 21 credits by the end of the second calendar year of enrollment.

Foundation Courses, 21 hours

Students who have not earned a recent undergraduate degree in business administration from an AACSB accredited school may be required to take credits from the courses listed below in order to satisfy the business administration foundation requirements.

- MBA 603 - Managerial Economics and Decisions of the Firm Credits: 3
- 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

Technology Management, MS

Banner Code: BU-MS-TECM

Phone: 703-993-1792
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 30 percent of the students already have graduate degrees. Approximately two-thirds 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: Australia, Taiwan, Japan, Thailand, India, Sweden, Belgium, England, Tunisia, Germany, Czech Republic and Ireland. 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.

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
- TECM 635 - Metrics and Statistics for Quality and Project Management Credits: 2
- TECM 640 - Management of Consulting and Technical Professionals Credits: 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
- TECM 735 - Technology Management Capstone Project Credits: 2
- TECM 740 - Management of Client Relationships Credits: 3
- TECM 745 - Business Functions and Operations: Client Industries Credits: 3
- TECM 750 - Global IT Management Credits: 3

Total: 36 credits
Master's Level Certificate

Real Estate Finance Graduate Certificate

Banner Code: BU-CERG-REAF

Contact:
Nicholas Archer-Hamilton
Program Manager, Executive Programs
703-993-1832
narcher1@gmu.edu

This graduate certificate prepares students for high-level managerial positions within the real estate industry. The program delivers a multi-disciplinary approach to real estate with a focus on development, finance, investment, valuation, regulatory law, and entrepreneurship. It is designed to serve industry leaders from the National Capital Region as well as enrolled graduate students within SOM who seek to enhance their position as current or future program leaders in the field.

Admissions Requirements

Completion of a four-year curriculum resulting in a Bachelor's degree from an accredited institution and/or current graduate students. Applicants should have two years of professional work experience and demonstrate a language proficiency in English.

- On line application and fee
- Official copies of transcripts from all colleges and universities attended
- One professional letter of recommendation
- A current resume
- A brief personal statement related to post-certificate career goals

Certificate Requirements

Required Courses

Students are responsible for familiarization and compliance with the university's Graduate Policies contained in this catalog. The graduate certificate requires successful completion of the following courses for a total of 18 hours.

- GSOM 660 - Economics for Managers Credits: 3
- GSOM 610 - Methods and Uses of Financial Accounting Credits: 3
- GSOM 640 - Finance for Managers Credits: 3
- GSOM 746 - Real Estate Analysis and Valuation Credits: 3
- GSOM 747 - Real Estate Finance Credits: 3
- GSOM 748 - Real Estate Investment Credits: 3

Program Note
Students who have completed MBA 746, MBA 747 and MBA 748 previously are not eligible for this certificate program.

Spatial Business Intelligence Graduate Certificate

Banner Code: BU-CERG-SBI

Contact:
Nicholas Hamilton-Archer
Program Manager, Executive Programs
703-993-1832
narcher1@gmu.edu

Spatial Business Intelligence (SBI) is an original powerful methodology that allows support traditional and spatial data through merging Geographic Information Systems (GIS) and Business Intelligence (BI) technologies. SBI approach allows integrating different systems, saving valuable resources, visualizing organization's assets, streamlining work flow processes, minimizing risk and enhancing business decision-making. Only recently has it been realized that the Spatial Component of Business operations through GIS Technology provides customer intelligence solutions that leads to better business decisions.

This 15-credit graduate certificate meets the needs of those with an undergraduate degree, who wish to complement their background with skills in innovative GIS technology application to business problems, spatial business modeling, business decision support, and business intelligence. A student will get the unique opportunity to become skilled in providing competitive advantage to businesses, governments, agencies and associations through merging GIS and Business Intelligence technologies.

Recent study proves that there is constant demand in business workforce with added knowledge in GIS technology and Spatial Intelligence from a Business Analyst and Manager to Chief Executive. In particular within the federal government and industries as: finance, insurance, telecommunication, real estate, retail, tourism, oil/gas, IT, HR, and consulting companies.

Certificate Requirements

The graduate certificate in Spatial Business Intelligence requires a total of 15 credit hours, or 5 academic graduate courses. Students must take 9 credit hours not counted towards any other graduate degree or certificate programs. A cumulative GPA of 3.0 is required for graduation. Students are responsible for familiarization and compliance with the university's Graduate Policies contained in this catalog.

Required courses

- GSOM 570 - Spatial Technology Applications in Business and Management Credits: 3
- GSOM 571 - Advanced Spatial Information Systems: Applications in Business and Management Credits: 3
- GSOM 631 - Business Applications of Data Mining Credits: 3

Electives

Two courses from the following:

- GSOM 520 - Foundations of Marketing Credits: 3
- GSOM 530 - Foundations of Operations Management Credits: 3
- GSOM 531 - Managing Business Systems Development Credits: 3
Additional Requirements

The SBI certificate program is opened to all students who hold a bachelor’s degree from an accredited institution, meet admissions requirements with a minimum GPA of 3.00. Applicants must submit a completed GMU graduate application along with a copy of undergraduate degree, official transcripts, resume, and two letters of recommendation, VA domicile classification form, and TOEFL if they are foreign nationals.

GMAT scores are not required.
School of Public Policy

Rooted in the strong democratic government traditions of the commonwealth of Virginia, the School of Public Policy (SPP) is committed to transcending traditional conceptual boundaries of research and teaching by integrating real-world experience and problem solving into public policy education. The school’s programs focus on the interplay of culture, organizations, and technology to find alternative approaches to public policy decisions and policy making. Teaching and research are focused on the following principal themes: governance; regional and economic development; international commerce and policy; science and technology policy; transportation policy; entrepreneurship; and culture and values in public policy.

SPP contributes to new and innovative concepts in policy formation while building on the fundamental, pluralistic, and democratic characteristics of policy making in the United States. SPP endorses creativity and responsibility in governance, public management, and the development of economic policy.

Administration

Kingsley E. Haynes, Dean
James H. Finkelstein, Vice 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 Services
Leslie Metzger Levin, Assistant Dean for Graduate Admissions and Marketing

Faculty

Associate Faculty

Avruch, Bernold, Conlan, Donahue, Flood, Frase, Friesz, Guagnano, Heclo, Hennessey, Mahler, Paden, Regan, Scimecca

Research and Term Faculty

Benson, Courtot, Davis, Ferrin, Ha, Holleman, Johnson, Keenan, Kil, Kingston, Leitch, Malur, Nicogossian, Paelinck, Regan, Riggle, Robb, Segerson, Spalding, Wheeler

Adjunct Faculty

Bensimon, Burrus, Fowler, Gaske, Gianturco, Gordon, Kewley, Muhlhausen, Robinson, Rogowsky, Stabile, Sullivan, Thompson, Varkonyi, Watkins

Faculty Emeritus

Kash, Warfield

Course Work

SPP offers courses designated PUBP, ITRN, MNPS, LRNG, and TELE in the Courses chapter of this catalog. Other academic courses are offered in conjunction with the research activities of the Mason Enterprise Center.

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.

Research Centers

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 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.

Mason Enterprise Center  
**Director:** Kingsley E. Haynes, PhD

Dedicated to creating and developing businesses in the Washington, D.C., area, the Mason Enterprise Center (MEC) is the synthesis of seven programs designed to meet the needs of growing businesses. The center focuses the energy, skills, and intellectual capital of the university on enterprise creation, expansion, and restructuring. MEC is highly geared on providing its clients with services that add value to their organizations. The center specializes in business development, entrepreneurship, government contracting, international business, technology ventures, and telework, making it a business-development center unlike any other. In addition, MEC conducts seminars and conferences related to its areas of expertise.

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 Science and Technology Policy  
**Director:** Philip Auerswald, 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.

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.

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 entrepreneurship 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 Aerospace Policy**  
**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.

**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**

**International Commerce and Policy, MA**

**Banner Code: PP-MA-ICP**

Phone: 703-993-8200

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 an 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)
- Two- to three-page 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. 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).

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 entering the program first complete core courses 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)
Electives (12 credits)

Students have the option to declare a substantive area of emphasis and focus their electives accordingly. The following areas are offered:

- Global Development
- Global Financial Policy
- Global Governance
- Global Business and Policy
- Global Trade Policy

Total: 42 credits

New Professional Studies, MS

Banner Code: PP-MS-NPST

▲ Peace Operations (PSPO)

Phone: 703-993-8200

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 an 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)
- Two- to three-page 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. 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).
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.

Course Requirements

Students must complete 39 credits as follows:

SPP Common Core (12 credits)

• 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

Peace Operations Core Courses (12 credits)

• MNPS 700 - The New Professionalism: Theory and Practice Credits: 3 *
• MNPS 702 - The New Professional as Reflective Practitioner Credits: 3 *
• MNPS 703 - Technology and Learning in the New Professions Credits: 3 *
• PUBP 550 - Topics in Public Policy Credits: 1-3
(Analysis for Peace Operations)

Electives (15 credits)

Electives must be approved by the program director or advisor.

Total: 39 credits

Note:

*Only those sections of MNPS 700, 702, and 703 designated for the Peace Operations Program will satisfy degree requirements.
Organization Development and Knowledge Management, MS

Banner Code: PP-MS-ODKM

Phone: 703-993-8200

The MS in Organization Development and Knowledge Management (ODKM) Program is an integrated, 18-month 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.

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 an 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)
- Two- to three-page 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. 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).

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 (12 credits)

- 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

Core Courses (9 credits)

- MNPS 700 - The New Professionalism: Theory and Practice Credits: 3
- MNPS 702 - The New Professional as Reflective Practitioner Credits: 3
- MNPS 703 - Technology and Learning in the New Professions Credits: 3

Note:

*Certain sections of MNPS 700, 702, and 703 are designated for the ODKM program, and only those will satisfy the degree requirements.

Additional Requirements (12 credits)

- LRNG 602 - Group Dynamics and Team Learning Credits: 3
- LRNG 672 - Organizational Learning Laboratory Credits: 3
- LRNG 762 - Strategic Knowledge Management Credits: 3
- MNPS 720 - 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

Public Policy, EMPP

Banner Code: PP-EMPP-PUBP

Phone: 703-993-8200
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 that are already successful in the public policy or 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

**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: 703-993-8200
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 an 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 waives)
- Two- to three-page 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. 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).

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
- ITRN 503 - Investment and Macroeconomics Credits: 1-4

and one of the following:
- PUBP 705 - Advanced Statistical Methods in Policy Analysis Credits: 3
- PUBP 713 - Policy and Program Evaluation Credits: 3
- PUBP 754 - Geographic Information Systems and Spatial Analysis for Public Policy Credits: 3

or approved substitution.

Substantive Policy Emphases (12 credits)

Electives are chosen from one of the following policy emphases:

- Collaboration and Learning in Policy Organizations
- Culture, Values, and Social Policy
- Global Medical and Health Policy
- Governance Systems and Policy Management
- International Governance and Institutions
- National Security
- Regional Economic Development and Technology Policy
- Science and Technology Policy
- Terrorism, Transnational Crime and Corruption
- Transportation Policy, Operations, and Logistics

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

Transportation Policy, Operations, and Logistics, MA

Banner Code: PP-MA-TPOL

Phone: 703-993-8200
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

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 an 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)
- Two- to three-page 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. 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).

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 (12 credits)

- 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

TPOL Core Courses (15 credits)

- PUBP 715 - Introduction to Transportation Systems Credits: 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

Electives (9 credits)

Electives must be approved by the program director or advisor.

Total: 36 credits

Master's Level Certificate

Collaboration and Learning in Policy Organizations Graduate Certificate

Banner Code: PP-CERG-CLPO

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 have to 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.

Certificate Requirements

Required Core

• PUBP 700 - Theory and Practice in Public Policy Credits: 3

Electives

• Electives (12)

Total: 15 credits
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 have to 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.

Certificate Requirements

Required Core

- PUBP 700 - Theory and Practice in Public Policy Credits: 3

Electives

- Electives (12)

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 have to 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.

Certificate Requirements
Required Core

- PUBP 757 - Public Policy in Global Health and Medical Practice Credits: 3
  or
- GCH 543 - Global Health: Trends and Policies 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

Electives

- Electives (6)

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 have to 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.

Certificate Requirements

Required Core

- ITRN 500 - Approaches to International Commerce and Policy Credits: 4

Electives

- Electives (12)
Total: 16 credits

**Governance Systems and Policy Management Graduate Certificate**

Banner Code: PP-CERG-GSPM

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 have to 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.

**Certificate Requirements**

**Required Core**

- PUBP 700 - Theory and Practice in Public Policy Credits: 3

**Electives**

- Electives (12)

Total: 15 credits

**International Business Planning Graduate Certificate**

Banner Code: PP-CERG-IBP

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 have to 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.

Certificate Requirements

Required Core

- ITRN 500 - Approaches to International Commerce and Policy Credits: 4

Electives

- Electives (12)

Total: 16 credits

International Governance and Institutions Graduate Certificate

Banner Code: PP-CERG-IGI

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 have to 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.

Certificate Requirements

Required Core

- PUBP 700 - Theory and Practice in Public Policy Credits: 3

Electives

- Electives (12)
Total: 15 credits

International Market Analysis Graduate Certificate

Banner Code: PP-CERG-IMA

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 have to 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.

Certificate Requirements

Required Core

- ITRN 500 - Approaches to International Commerce and Policy Credits: 4

Electives

- Electives (12)

Total: 16 credits

Managing International Commerce Graduate Certificate

Banner Code: PP-CERG-MIC

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 have to 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.

Certificate Requirements

Required Core

- ITRN 500 - Approaches to International Commerce and Policy Credits: 4

Electives

- Electives (12)

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 have to 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.

Certificate Requirements

Required Core

- PUBP 700 - Theory and Practice in Public Policy Credits: 3

Electives

- Electives (12)
Total: 15 credits

Regional Economic Development and Technology Policy Graduate Certificate

Banner Code: PP-CERG-REDT

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 have to 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.

Certificate Requirements

Required Core

- PUBP 700 - Theory and Practice in Public Policy Credits: 3

Electives

- Electives (12)

Total: 15 credits

Regional Trade Policy and Planning Graduate Certificate

Banner Code: PP-CERG-RTP

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 have to 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.

Certificate Requirements

Required Core

- ITRN 500 - Approaches to International Commerce and Policy Credits: 4

Electives

- Electives (12)

Total: 16 credits

Science and Technology Policy Graduate Certificate

Banner Code: PP-CERG-STP

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 have to 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.

Certificate Requirements

Required Core

- PUBP 700 - Theory and Practice in Public Policy Credits: 3

Electives

- Electives (12)
Total: 15 credits

Science, Technology, and the Global Economy Graduate Certificate

Banner Code: PP-CERG-STGE

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 have to 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.

Certificate Requirements

Required Core

- ITRN 500 - Approaches to International Commerce and Policy Credits: 4

Electives

- Electives (12)

Total: 16 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 have to 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.

Certificate Requirements

Required Core

- PUBP 715 - Introduction to Transportation Systems Credits: 3

Elective

- Electives (12)

Total: 15 credits

Doctoral Degree

Public Policy, PhD

Banner Code: PP-PHD-PUBP

Phone: 703-993-8200

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 Requirements

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 an 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)
- Two- to three-page 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. 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)

**Deadlines**

The application deadline is February 1 for international students and March 1 for domestic students.

**Degree Requirements**

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. Credit is not given for comprehensive exams passed at other universities.

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.

At the completion of the first academic year of full-time study, 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. The program also requires that students pass a field exam structured around their specific field of proposed doctoral research. Other requirements include the successful preparation and defense of a doctoral research proposal and the ensuing dissertation.

A complete description of the program policies, procedures, and requirements is in the SPP student and faculty handbook, which is published annually.

**Areas of Program Specialization**

Students may choose one of the established areas of specialization or work with a faculty committee to create their own specialization. The established specializations 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.

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 - National Policy Systems and Theory Credits: 3

Core Courses

- PUBP 800 - Culture and Policy Credits: 2-4
- PUBP 801 - Macro Policy Credits: 2-4
- PUBP 804 - Multivariate Statistical Analysis in Public Policy Credits: 4
- PUBP 805 - Public Policy Systems and Theory Credits: 4
- *Students whose final paper in PUBP 801 is deemed unacceptable for a doctoral program must take PUBP 709 the following semester. PUBP 709 credit hours will not count as part of the 82 hours of course work. Failure to earn a grade of B or better in PUBP 709 may result in dismissal. Qualifying Exam taken upon completion of all course courses.

Stage Two - Policy Fields and Skills

- Three elective courses
- One advanced methods course
- PUBP 850 - Seminar in Public Policy Credits: 1

Stage Three - Research Foundations

- Field of Study (3 courses)
- Advanced Methods (1 course)
- Field Statement
- Field Exam

Area of Specialization Requirements
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 (excluding those 700 level courses listed as not eligible for PhD Field credit), 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.

Stage Four - Dissertation

- Proposal Oral Defense
- Dissertation Oral Defense
- PUBP 998 - Research/Proposal for Dissertation Credits: 1-9
- PUBP 999 - Dissertation Credits: 1-9 (998 + 999, 12 credits total, at least 6 credits from 999)

Advancement to Candidacy

To advance to candidacy, students must have completed all course work requirements, passed the comprehensive qualifying and field examinations, have an approved dissertation committee, and presented and successfully defended a dissertation proposal.
College of Science

College of Science

Phone: 703-993-3622
Web: cos.gmu.edu
College Code: SC

Departments

- Atmospheric, Oceanic and Earth Sciences
- Bioinformatics and Computational Biology
- Chemistry and Biochemistry
- Computational and Data Sciences
- Environmental Science and Policy
- Geography and Geoinformation Science
- Mathematical Sciences
- Molecular and Microbiology
- Physics and Astronomy

Additional Academic Units

- Biology Undergraduate Program
- Forensic Science Program
- Neuroscience Program

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 9 departments, 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
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 10 master’s degrees and 10 doctoral degrees. The requirements for each degree are described in the departmental and degree sections that follow. 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.

Undergraduate Degree Programs

COS offers 6 bachelor of arts degrees and 10 bachelor of science degrees. These undergraduate degree 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 superceded 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 for a total of 6 credits. These 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 any course in ADJ, ANTH, ECON, GEOG (except GEOG 102 or 309), GOVT, HIST (except 100 or 125), LING, PSYC, or SOCI.
- 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, 311, 313, 330, 332, 396; ARTH 203, 204, 319, 320, 380, 381, 382, 383, 384, 385, 482; CHIN 318, 320, 325; DANC 118; ECON 361, 362; FREN 451; GEOG 101, 316, 325, 330, 399; GOVT 328, 332, 333, 340, 341, 345, 342, 433; HIST 130, 251, 252, 261, 262, 271, 281, 282, 328, 329, 353, 354, 355, 356, 365, 366, 367, 387, 426, 459, 460, 461, 465, 466; 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**

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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.

**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 (Enterprise Hall, Suite 316; 703-993-8725; cosdean@gmu.edu). Additional policy information and forms are available online at www.gmu.edu/student/academicaffairs.

**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**

The university limits undergraduate students with a cumulative GPA below 2.00 to 13 credit hours per semester. All undergraduate students returning from suspension are also limited to a maximum of 13 credit hours. Exceptions to this rule are very rare and only occur in exceptional cases.

Undergraduate students in good standing may enroll in up to 18 credit hours each semester. In exceptional circumstances, students may request an overload of the maximum credit hours. 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.

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

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.

**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 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.

**University Consortium Registration**

Participation in consortium registration is available to degree-seeking juniors and seniors in good standing currently enrolled at Mason. Participation is limited to courses that are approved by the student’s department chair and academic dean, apply to the student’s program of study, are not offered during that semester at Mason, and have space available at the consortium institution. Students should consult with the Consortium Coordinator in the Registrar’s Office, as additional restrictions may apply. Students may take just one course per semester, with a career maximum of two courses. 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.

**Credit to Be Earned at Other Institutions**

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.

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 can seldom be approved. Courses offered at Consortium Universities must be reviewed by the Consortium Coordinator in advance and will not be considered for general 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 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 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:

- Have a cumulative GPA of 2.25 or higher at Mason
- Have completed the immediately preceding semester at Mason with a 2.00 or higher
- Have completed the necessary forms and have obtained all required signatures and course equivalencies

The Center for Global Education (globaled.gmu.edu/index.html) 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.

**Academic Clemency**

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 exception, 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 in writing by the last day of classes for their first semester back at George Mason
- In order to make this request, students should (a) enroll in at least 6 hours during their first semester back at George Mason and (b) earn at least a 2.50 semester GPA with no grade below “C.” If these minimum academic requirements are not met during the first semester of return, then clemency will not be allowed under any circumstances

Additional information about clemency can be found at www.gmu.edu/student/academicaffairs/policies.htm.

**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 Undergraduate Programs. 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 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 Undergraduate Programs is the final level of appeal for COS college level requirements, retroactive adds, withdrawals, graduation, and return from suspension and dismissal. The Associate Dean 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.
Grievances

Grievances should be directed in writing to the Associate Dean for Undergraduate Programs. 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) with a curriculum grade point average (GPA) of at least 2.75 are considered to have met all of George Mason University’s lower level general education requirements. They are still required by the university to complete ENGL 302 and a synthesis course. Transfer students who meet the conditions above and are pursuing a degree in COS 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.

Excluded Courses

Physical Education (PHED) and Parks, Recreation, and Leisure Studies (PRLS) activity courses cannot be counted toward credits required for a degree in the College of Science. Students may use nonactivity PHED and PRLS courses for elective credit for college degrees. For a current list of PHED and PRLS courses that may be used for credit in the college, see the CHSS Undergraduate Academic Affairs Office Web site at http://www.gmu.edu/student/academicaffairs/. Military Science (MLSC) courses cannot be counted toward credits required for a degree in the college.

Once admitted to Mason, students may not take CLEP exams and apply credits from those exams to degrees in the College of Science. Students may apply credits from CLEP exams to degrees in the college only if those credits were awarded at the time of admission.

Atmospheric, Oceanic and Earth Sciences

Phone: 703-993-8958
Web: aoes.gmu.edu

Faculty

Professors: Diecchio, Hazen (Robinson Professor), Schneider, Schopf, Shukla (chair), Straus

Associate professors: DeSole, Harlan, Huang, Kinter, Klinger, McBride

Assistant professors: Jin, Kysar-Mattietti

Contract professor: Doty, Krishnamurthy, Nord-Cooper, Verardo

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 or BIOL 307, 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 307 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 the following courses with an average GPA of 3.50 or better: GEOL 406, 410, and 411.

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 a specialty concentration. The concentrations in environmental science and in coastal oceanography and estuarine science are offered jointly with the department of Environmental Science and Policy where specific advising is 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.

Degree Requirements

32 credits of core science and mathematics:

- CHEM 211 - General Chemistry Credits: 4
- CHEM 212 - General Chemistry Credits: 4
- GEOG 309 - Introduction to Meteorology and Climate Credits: 3
- 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
- GEOL 406 - Seminar in Earth and Environmental Science Credits: 3
  or
- GEOL 420 - Earth Science and Policy Credits: 3
- GEOL 309 - Introduction to Oceanography Credits: 3
  or
- BIOL 309 - Introduction to Oceanography 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

27–35 credits in one of the following concentrations:

▲ Coastal Oceanography and Estuarine Science (COES)

- GEOL 102 - Introductory Geology II Credits: 4
- EVPP 421 - Marine Conservation Credits: 3
- BIOL 449 - Marine Ecology Credits: 3
- GEOL 363 - Coastal Morphology and Processes Credits: 4
- EVPP 350 - Freshwater Ecosystems Credits: 4

and one of the sequences:

- EVPP 110 - The Ecosphere: An Introduction to Environmental Science I Credits: 4
- EVPP 111 - The Ecosphere: An Introduction to Environmental Science II Credits: 4

- BIOL 103 - Introductory Biology I Credits: 4
- BIOL 104 - Introductory Biology II Credits: 4

- BIOL 213 - Cell Structure and Function Credits: 4
- BIOL 303 - Animal Biology Credits: 4

and four of the following:

- BIOL 440 - Field Biology Credits: 1-4
  (ocean and estuarine themed topics only)
- BIOL 507 - Selected Topics in Ecology Credits: 1-4
- BIOL 536 - Ichthyology 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 313 - Hydrogeology Credits: 3
- GEOL 401 - Structural Geology Credits: 4
- NCLC 395 - Field-Based Work Credits: 1-15
  (ocean and estuarine topics only)

▲ Earth Science Education (ESE)

- 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:

- 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

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)

- 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 **
• GEOL 317 - Geomorphology Credits: 4

and four of the following:

• 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
• GEOG 311 - Introduction to Geographic Information Systems Credits: 3
• GEOG 412 - Aerial Photography Interpretation Credits: 3
• GEOG 416 - Satellite Image Analysis Credits: 3

▲ Environmental Science (EVSC)

• BIOL 307 - Ecology Credits: 4
• 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 336 - Human Dimensions of the Environment Credits: 3
• EVPP 377 - Applied Ecology Credits: 3
• GEOL 303 - Field Mapping Techniques Credits: 3
• GEOL 305 - Environmental Geology Credits: 3
• GEOL 306 - Soil Science Credits: 3

and two of the following:

• BIOL 345 - Plant Communities Credits: 4
• BIOL 449 - Marine Ecology Credits: 3
• EVPP 350 - Freshwater Ecosystems Credits: 4
• EVPP 363 - Coastal Morphology and Processes Credits: 4

▲ Geology (GEOL)

• 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 ***

Notes:

* Requires C or better in GEOL 302

** Satisfies general education information technology requirement

*** No longer offered regularly; 6-credit geology field camp is required as substitute (see advisor for details).

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. (Through the course work below, geology majors satisfy the university wide requirements in natural science and quantitative reasoning.)

Degree Requirements

• 9 credits of degree-related course work in a coherent program designed in coordination with advisor and approved by department chair
• MATH 110 - Introductory Probability and Statistics Credits: 3
  or
• MATH 111 - Linear Mathematical Modeling Credits: 3
  or
• MATH 113 - Analytic Geometry and Calculus I Credits: 4
• CHEM 211 - General Chemistry Credits: 4
• CHEM 212 - General Chemistry Credits: 4
• GEOL 316 - Computers in Geology Credits: 3
  or
• CS 112 - Introduction to Computer Programming Credits: 4
  or
• IT 103 - Introduction to Computing Credits: 3

38 credits in geology, including:

• 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 **

Notes:

* Students must achieve a grade of 2.00 or better in GEOL 302 before taking GEOL 304 or 308.
** No longer offered regularly; 6-credit geology field camp is required as substitute (see your advisor for details).

Undergraduate Minor

Earth Science Minor

Banner Code: ESCI

Course Work

To receive this minor, students must successfully complete 18 credits with a minimum GPA of 2.00, distributed as follows:

• GEOL 101 - Introductory Geology I Credits: 4
• GEOL 309 - Introduction to Oceanography Credits: 3
• GEOG 309 - Introduction to Meteorology and Climate Credits: 3

Electives

• 8 credits of geology electives

Notes:

Eight credits of course work must be unique to the minor.

Students may not receive both the minor in geology and the minor in earth science. For policies governing all minors, see the Academic Policies chapter of this catalog.

Total: 18 credits
Geology Minor

Banner Code: GEOL

Course Work

To receive the minor, students must successfully complete 20 credits 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:

Eight credits of course work must be unique to the minor. For policies governing all minors, see the Academic Policies section of this catalog.

*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 20-21 credits with a minimum GPA of 2.00 as follows.

Course Work

14-15 credits of core courses:

- All students take:
  - GEOL 101 - Introductory Geology I Credits: 4
plus one of the following:
- BIOL 103 - Introductory Biology I Credits: 4
- BIOL 213 - Cell Structure and Function Credits: 4
- EVPP 110 - The Ecosphere: An Introduction to Environmental Science I Credits: 4

and one of the following:
- GEOL 309 - Introduction to Oceanography Credits: 3
- BIOL 309 - Introduction to Oceanography Credits: 3

and one of the following:
- GEOL 363 - Coastal Morphology and Processes Credits: 4
- EVPP 363 - Coastal Morphology and Processes Credits: 4
- BIOL 449 - Marine Ecology Credits: 3 *

6 credits of electives from the following:

- GEOL 363 - Coastal Morphology and Processes Credits: 4 *
  or
- EVPP 363 - Coastal Morphology and Processes Credits: 4 *

- BIOL 449 - Marine Ecology Credits: 3 *
- EVPP 350 - Freshwater Ecosystems Credits: 4
- EVPP 419 - Marine Mammal Biology and Conservation Credits: 3
- EVPP 421 - Marine Conservation Credits: 3
- NCLC 395 - Field-Based Work Credits: 1-15
- NCLC 495 - Field-Based Work Credits: 1-15
- BIOL 440 - Field Biology Credits: 1-4
- BIOL 507 - Selected Topics in Ecology Credits: 1-4
- EVPP 581 - Estuarine and Coastal Ecology Credits: 3 **
- EVPP 582 - Estuarine and Coastal Ecology Laboratory Credits: 1 **

- BIOL 536 - Ichthyology Credits: 4
  or
- EVPP 536 - Ichthyology Credits: 4

Notes:

PHED 225 is strongly recommended but not required. Eight credits of course work must be unique to the minor. For policies governing all minors, see the Academic Policies section of this catalog.

*If not previously counted

**If chosen, must take both lecture and lab for a total of 4 credits

Total: 20-21 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. While there is no unambiguous definition of “climate,” climate dynamics is generally considered to encompass processes that determine the behavior of the atmosphere, land, and oceans averaged over time scales of weeks to centuries and millennia. 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 global change. While it is thought to be theoretically impossible to predict day-to-day weather more than a few weeks in advance, recent 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.

Climate dynamics faculty members are varied and have a blend of expertise in dynamics, statistics, and computational methods. They cover the traditional areas of atmospheric dynamics, physical and dynamical oceanography, land surface physics, and hydrology. The faculty and students involved in the program work closely with scientists at the Center for Ocean-Land-Atmosphere Studies (COLA).

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; deforestation, desertification, and monsoons; atmosphere-ocean interaction; land-climate interaction; decadal climate variability; ocean circulation theory; abrupt climate change; and water and energy cycle dynamics.

External research collaborations exist with federal agencies, private corporations, and other universities, exemplifying COS’ and the university’s commitment to the development of effective regional and national collaborations. The faculty is heavily involved with national and international climate science efforts, providing students with the opportunity for participation in research.

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-SUB is recommended if it is given in the student’s undergraduate major. 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.

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:

**Fundamental climate science courses:**

- 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:**

- 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 of:**

- CLIM 991 - Climate Dynamics Seminar Credits: 1

**Electives**

- 24 credits of electives, including up to 5 credits of independent research

**Note:**

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, students take the specialty component, which is administered by the dissertation committee that students typically form by the spring semester of their second year. 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 and produce the dissertation while taking CLIM 999. 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.

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**Bioinformatics and Computational Biology**

Phone: 703-993-8400
Web: bioinformatics.gmu.edu
Faculty

Professors: Grefenstette, Jafri (chair), Willett

Associate professors: Kinser, Klimov, Seto, Vaisman

Contract assistant professor: Solka


Course Work

The department offers all course work designated BINF in the Courses chapter of this catalog.

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.

Course Work

Students must complete the following courses (either 22 or 24 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
- BINF 403 - Bioinformatics and Computational Biology Lab I Credits: 1
- BINF 404 - Bioinformatics and Computational Biology Lab II Credits: 1
- 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 208 - Program Design and Data Structures Credits: 3
Total: 22 or 24 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.

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.

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 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: 3

Capstone research project (3 credits)

Focusing on bioinformatics management issues and techniques.

- BINF 798 - Research Project Credits: 3

Total: 30 credits
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. 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.

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):

- BINF 630 - Bioinformatics Methods Credits: 3
- BINF 631 - Molecular Cell Biology for Bioinformatics Credits: 3
- BINF 634 - Bioinformatics Programming Credits: 3
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 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

Recent advances in molecular biology have produced an avalanche of data, including DNA sequences and genetic maps that cover thousands of genes whose functions are poorly understood or completely unknown. These advances are having a profound effect on the biological sciences and have resulted in the development of the new discipline of bioinformatics. Bioinformatics uses computational approaches to analyze patterns in biological data and create complex models of biological activity, including attempts to elucidate the functions of genes and their interactions in genetic pathways. Widespread social benefits are expected from the exploitation of the wealth of new knowledge concerning the genetic mechanisms of life and related processes. The coming years will see major developments in medicine, functional genomics, and environmental sciences, as well as profound advances in understanding the fundamental processes of biology. These benefits are increasingly dependent on the application of advanced information technology to the analysis of biological information.

The program’s main objective is to train the next generation of computational biologists for careers in academia, industry, and government. The program provides students with an interdisciplinary academic environment, including fundamental biosciences courses and 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.

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 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
ingstitution 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 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.

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 72 required credits may be reduced by up to 30 credits, depending
on graduate courses completed. The curriculum is divided into four areas: 12 credits of fundamental biosciences courses; 13
credits of core bioinformatics courses; 23 credits of electives or independent research; and 24 credits of dissertation research. The
course work is organized as follows:

Fundamental bioscience courses:

- BINF 701 - Biochemical Systematics (Biochemistry) Core for Doctoral Studies in Biosciences and Bioinformatics
  Credits: 3
- BINF 702 - Research Methods Credits: 3

plus 3 credits each of:

- BINF 703 - Bioinformatics Lab Rotation Credits: 1
- BINF 704 - Colloquium in Bioinformatics Credits: 1

Core bioinformatics courses:

- BINF 690 - Numerical Methods for Bioinformatics Credits: 3
- BINF 705 - Research Ethics Credits: 1
- BINF 730 - Biological Sequence Analysis Credits: 3
- BINF 731 - Protein Structure Analysis Credits: 3
- BINF 732 - Genomics Credits: 3
  or
- BINF 740 - Introduction to Biophysics Credits: 3

General electives

Note:

Students whose undergraduate record does not include basic biochemistry will be required to take a basic course prior to BINF
701 Biochemical Systematics (Biochemistry). If the undergraduate record is otherwise insufficient, students may
be required to take prerequisite courses, some of which may not be applicable to the 48-credit course total for the bioinformatics PhD. 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. On passing the candidacy exam and submitting an acceptable dissertation proposal, the student is advanced to doctoral candidacy.

**Biology Undergraduate Program**

Phone: 703-993-1050  
Web: biology.gmu.edu

**Faculty**

**Director:** Rockwood  
**Assistant Director:** Beck  
**Professors:** Rockwood  
**Term associate professors:** Beck, Cressey, Polayes  
**Term assistant professors:** Coss, Fondufe, Kocache, Madden, Otto, Polayes  
**Adjunct faculty:** Henley, Jones, Kaminski, Laemmerzahl, McClintock, Oaks, Tondi, Wood-Salvesen

The Biology Undergraduate Program is a collaboration between the Department of Molecular and Microbiology (MMB) 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 MMB Department 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 contacting the Biology Program office, David J. King Hall, Room 3005, 703-993-1050.

**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
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 3.50 or better
- GPA in supporting requirements (math and other science) must be 3.00 or better
- Grade of B or better in Biol 213

Ideally, we would like to recruit students in their freshman or sophomore year.

Retention Requirements

Students in honors biology must maintain a biology GPA of 3.50 or better and a supporting GPA of 3.00 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 7 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 3.50 GPA in honors biology courses
- Minimum 3.50 GPA in biology requirements
- Minimum 3.00 GPA in supporting requirements
Minimum 3.00 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 medical technology fulfill this requirement by successfully completing BIOL 453. Students not taking BIOL 453 at Mason should consult the program director for a course to fulfill this requirement.

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. Professional study during the senior year involves clinical education at an affiliated school of medical technology. Thirty credits of course work are required, including MTCH 401, 402, 403, 404, 405, and 406. 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.

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 and then take one of the following to complete the requirement: BIOL 303, 304, or 305/306. Chemistry, physics, and mathematics majors should consult their faculty advisor to determine which biology courses to take.

Medical Laboratory Technician Articulation Program

A special program is available for Medical Laboratory Technicians (MLTs) who are graduates of associate degree programs. This program provides substantial credit for the scientific and clinical aspects of the associate degree but requires students to meet clinical requirements for national certifying exams through approved work experience. For details, contact the program director.

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, 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 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**

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 also complete the following credits with a minimum GPA of 2.50 in the 32 credits of BIOL courses and a minimum GPA of 2.00 in the supporting courses listed below. No more than 8 credits of 100-level BIOL courses (103, 104, 124, 125) may be applied toward the 32 credits of required BIOL courses. (Through the course work below, biology majors satisfy the university-wide requirements in natural science, quantitative reasoning, and information technology proficiency.)

**Degree Requirements**
25 credits of biology core courses:

- BIOL 213 - Cell Structure and Function Credits: 4
- BIOL 303 - Animal Biology Credits: 4
- BIOL 304 - Plant Biology Credits: 4
- BIOL 305 - Biology of Microorganisms Credits: 3
- BIOL 306 - Biology of Microorganisms Laboratory Credits: 1
- BIOL 307 - Ecology Credits: 4
- BIOL 311 - General Genetics Credits: 4
- BIOL 492 - Senior Seminar Credits: 1
  or
- BIOL 494 - Honors Seminar in Biology Credits: 1

7 credits of biology electives:

- 7 credits of additional biology courses

8 credits of chemistry:

- CHEM 103 - Chemical Science in a Modern Society Credits: 4
- CHEM 104 - Introduction to Organic, Biochemical, Pharmacological, and Fuel Chemistry Credits: 4
  or
- CHEM 211 - General Chemistry Credits: 4
- CHEM 212 - General Chemistry Credits: 4

6 credits of statistics and computer science:

- STAT 250 - Introductory Statistics I Credits: 3
- IT 103 - Introduction to Computing Credits: 3

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
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.

Concentrations

Students may choose to complete the requirements of the Education with Licensure concentration described below. Or, they may take biology elective courses of their choice to complete the requirement of 32 credits of biology. Students who choose to complete the concentration, must complete their course work with a minimum GPA of 2.50 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 8 credits of 100-level BIOL courses (103, 104, 124, 125) may be applied toward the 32 credits of required BIOL courses.

▲ 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. (Through the course work below, they satisfy the university-wide general education requirements in natural science, quantitative reasoning, and information technology proficiency.)

30 credits of biology core courses:

- BIOL 213 - Cell Structure and Function Credits: 4
- BIOL 303 - Animal Biology Credits: 4
- BIOL 304 - Plant Biology Credits: 4
- BIOL 305 - Biology of Microorganisms Credits: 3
- BIOL 306 - Biology of Microorganisms Laboratory Credits: 1
- BIOL 307 - Ecology Credits: 4
- BIOL 311 - General Genetics Credits: 4
- BIOL 425 - Human Physiology Credits: 3
- BIOL 471 - Evolution Credits: 3

2 credits of biology electives:

- 2 credits of additional biology courses

8 credits of chemistry:

- CHEM 103 - Chemical Science in a Modern Society Credits: 4
- CHEM 104 - Introduction to Organic, Biochemical, Pharmacological, and Fuel Chemistry Credits: 4
  or
• CHEM 211 - General Chemistry Credits: 4
• CHEM 212 - General Chemistry Credits: 4

6 credits of statistics and computer science:

• STAT 250 - Introductory Statistics I Credits: 3
• IT 103 - Introduction to Computing Credits: 3

3 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

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

Biology, BS

Banner Code: SC-BS-BIOL

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 2.50 in BIOL courses and a minimum GPA of 2.00 in the supporting courses. No more than 8 credits of 100-level BIOL courses (103, 104, 124, 125) may be applied toward the required BIOL courses. Several optional concentrations are available. (Through the course work below, biology majors satisfy the university-wide requirements in natural science, quantitative reasoning, and information technology proficiency.)

Degree Requirements
Students who do not select an optional concentration complete the curriculum requirements listed below.

25 credits of biology core courses:

- BIOL 213 - Cell Structure and Function Credits: 4
- BIOL 303 - Animal Biology Credits: 4
- BIOL 304 - Plant Biology Credits: 4
- BIOL 305 - Biology of Microorganisms Credits: 3
- BIOL 306 - Biology of Microorganisms Laboratory Credits: 1
- BIOL 307 - Ecology Credits: 4
- BIOL 311 - General Genetics Credits: 4
- BIOL 492 - Senior Seminar Credits: 1
  or
- BIOL 494 - Honors Seminar in Biology Credits: 1

19 credits of biology electives:

- 19 credits of additional biology courses

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 best meets their career goals.

- One chemistry course at the 300 or 400 level (3)
- CHEM 314 - Organic Chemistry Credits: 3
  and
- CHEM 318 - Organic Chemistry Lab II Credits: 2
- GEOL 101 - Introductory Geology I Credits: 4
  and
- GEOL 102 - Introductory Geology 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

At least 6 credits chosen from:

• MATH 110 - Introductory Probability and Statistics 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

3 credits of computer science:

• IT 103 - Introduction to Computing Credits: 3

Note:

Students who wish to take biochemistry must take BIOL 483 to receive credit toward the major in biology.

Concentrations

Students may choose to complete the requirements of one of the concentrations described below. Students who choose to undertake a concentration must complete their course work with a minimum GPA of 2.50 in BIOL courses and a minimum GPA of 2.00 in the supporting requirements. No more than 8 credits of 100-level BIOL courses (103, 104, 124, 125) may be applied toward the required BIOL courses.

▲ Concentration in Biotechnology (BT)

The biotechnology 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 must fulfill all requirements for bachelor’s degrees including university general education requirements. In addition, students majoring in biology with a concentration in biotechnology must complete the following. (Through the course work below, they satisfy the university-wide general education requirements in natural science, quantitative reasoning, and information technology proficiency.)

31 credits of biology core courses:
- BIOL 213 - Cell Structure and Function Credits: 4
- BIOL 303 - Animal Biology Credits: 4
- BIOL 304 - Plant Biology Credits: 4
- BIOL 305 - Biology of Microorganisms Credits: 3
- BIOL 306 - Biology of Microorganisms Laboratory Credits: 1
- BIOL 307 - Ecology Credits: 4
- BIOL 311 - General Genetics Credits: 4
- BIOL 385 - Biotechnology and Genetic Engineering Credits: 3
- BIOL 483 - General Biochemistry Credits: 4

13 credits of biology electives chosen from:

- BIOL 312 - Biostatistics Credits: 4
- BIOL 322 - Developmental Biology Credits: 4
- 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 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 425 - Human Physiology Credits: 3
- BIOL 452 - Immunology Credits: 3
- BIOL 453 - Immunology Laboratory Credits: 1 *
- BIOL 465 - Histology Credits: 4
- 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 **
- BIOL 506 - Selected Topics in Microbiology Credits: 1-4 **
- BIOL 553 - Advanced Topics in Immunology Credits: 3
- BIOL 556 - Advanced Topics in Microbial Physiology and Metabolism Credits: 3
- BIOL 563 - Virology Credits: 3
- BIOL 566 - Cancer Genomics Credits: 3
- BIOL 568 - Advanced Topics in Molecular Genetics Credits: 3
- BIOL 572 - Human Genetics Credits: 3
- BIOL 575 - Selected Topics in Genetics Credits: 1-4 **
- BIOL 580 - Computer Applications for the Life Sciences Credits: 3

Notes:

*Laboratories associated with BIOL 403 and BIOL 453 are required.
**Registration for BIOL 417, 418, 497 or 575 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

At least 6 credits chosen from:

- MATH 110 - Introductory Probability and Statistics 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

3 credits of computer science:

- IT 103 - Introduction to Computing Credits: 3

▲ 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 bachelor’s degrees including university general education requirements. In addition, students majoring in biology with a concentration in education with licensure must complete the following. (Through the course
work below, they satisfy the university-wide general education requirements in natural science, quantitative reasoning, and
information technology proficiency.)

30 credits of biology core courses:

- BIOL 213 - Cell Structure and Function Credits: 4
- BIOL 303 - Animal Biology Credits: 4
- BIOL 304 - Plant Biology Credits: 4
- BIOL 305 - Biology of Microorganisms Credits: 3
- BIOL 306 - Biology of Microorganisms Laboratory Credits: 1
- BIOL 307 - Ecology Credits: 4
- BIOL 311 - General Genetics Credits: 4
- BIOL 425 - Human Physiology Credits: 3
- BIOL 471 - Evolution Credits: 3

8 credits of biology electives:

- 8 credits of additional biology courses

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)
  - CHEM 314 - Organic Chemistry Credits: 3
  - CHEM 318 - Organic Chemistry Lab II Credits: 2

- GEOL 101 - Introductory Geology I Credits: 4
  - GEOL 102 - Introductory Geology 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

At least 6 credits chosen from:

• MATH 110 - Introductory Probability and Statistics 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
• BIOL 312 - Biostatistics Credits: 4

3 credits of computer science:

• IT 103 - Introduction to Computing 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
• 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

▲ 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 must fulfill all requirements for bachelor’s degrees including university general education requirements. In addition, students seeking the concentration in environmental and conservation biology must complete the following. (Through the course work below, they satisfy the university-wide general education requirements in natural science, quantitative reasoning, and information technology proficiency.)

33 credits of biology core courses:

• BIOL 213 - Cell Structure and Function Credits: 4
• BIOL 303 - Animal Biology Credits: 4
• BIOL 304 - Plant Biology Credits: 4
• BIOL 305 - Biology of Microorganisms Credits: 3
• BIOL 306 - Biology of Microorganisms Laboratory Credits: 1
• BIOL 307 - Ecology Credits: 4
• BIOL 311 - General Genetics Credits: 4
• BIOL 318 - Conservation Biology Credits: 3
• BIOL 377 - Applied Ecology Credits: 3
• BIOL 471 - Evolution Credits: 3

11 credits of biology electives chosen from:

• 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 333 - Vertebrate Zoology Credits: 4
• BIOL 342 - Plant Morphology Credits: 4
• BIOL 344 - Taxonomy of Flowering Plants Credits: 4
• BIOL 345 - Plant Communities Credits: 4 *
• BIOL 440 - Field Biology Credits: 1-4
• BIOL 472 - Introductory Animal Behavior Credits: 3
• BIOL 449 - Marine Ecology Credits: 3
• EVPP 350 - Freshwater Ecosystems Credits: 4 *
• EVPP 451 - Fungi and Ecosystems Credits: 3
• NCLC 401 - Conservation Biology Credits: 3-15

Note:

*If not used for field course requirement.

4 credits of field work:

• EVPP 350 - Freshwater Ecosystems Credits: 4
or
• BIOL 345 - Plant Communities Credits: 4

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 (3)
• CHEM 314 - Organic Chemistry Credits: 3
  and
• CHEM 318 - Organic Chemistry Lab II Credits: 2
• GEOL 101 - Introductory Geology I Credits: 4
  and
• GEOL 102 - Introductory Geology 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

At least 6 credits chosen from:

• MATH 110 - Introductory Probability and Statistics 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

3 credits of computer science:

• IT 103 - Introduction to Computing Credits: 3

▲ 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 must fulfill all requirements for bachelor’s degrees including university general education requirements. In addition, students seeking the concentration in microbiology must complete the following. (Through the course work below, they satisfy the university-wide general education requirements in natural science, quantitative reasoning, and information technology proficiency.)

36 credits of biology core courses:

- BIOL 213 - Cell Structure and Function Credits: 4
- BIOL 303 - Animal Biology Credits: 4
- BIOL 304 - Plant Biology Credits: 4
- BIOL 305 - Biology of Microorganisms Credits: 3
- BIOL 306 - Biology of Microorganisms Laboratory Credits: 1
- BIOL 307 - Ecology Credits: 4
- BIOL 311 - General Genetics Credits: 4
- BIOL 405 - Microbial Genetics Credits: 4
- BIOL 406 - Microbial Physiology and Metabolism Credits: 4
- BIOL 407 - Microbial Diversity Credits: 4

8 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 452 - Immunology Credits: 3
- BIOL 453 - Immunology Laboratory Credits: 1
- BIOL 459 - Fungi and Ecosystems Credits: 3
- BIOL 483 - General Biochemistry Credits: 4
- BIOL 506 - Selected Topics in Microbiology Credits: 1-4
- BIOL 563 - Virology Credits: 3
- BIOL 580 - Computer Applications for the Life Sciences Credits: 3

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

At least 6 credits chosen from:

- MATH 110 - Introductory Probability and Statistics 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

3 credits of computer science:

- IT 103 - Introduction to Computing Credits: 3

▲ Concentration in Molecular Biology (MOB)

The molecular biology concentration provides basic knowledge of the structure of macromolecules, and chemical processes that occur in living cells. The concentration prepares students for employment or further advanced study in molecular biology.

Students must fulfill all requirements for bachelor’s degrees including university general education requirements. In addition, students majoring in biology with a concentration in molecular biology must complete the following. (Through the course work below, they satisfy the university-wide general education requirements in natural science, quantitative reasoning, and information technology proficiency.)

36 credits of biology core courses:

- BIOL 213 - Cell Structure and Function Credits: 4
- BIOL 303 - Animal Biology Credits: 4
- BIOL 304 - Plant Biology Credits: 4
- BIOL 305 - Biology of Microorganisms Credits: 3
- BIOL 306 - Biology of Microorganisms Laboratory Credits: 1
- BIOL 307 - Ecology Credits: 4
- BIOL 311 - General Genetics Credits: 4
- BIOL 385 - Biotechnology and Genetic Engineering Credits: 3
• BIOL 482 - Introduction to Molecular Genetics Credits: 3
• BIOL 483 - General Biochemistry Credits: 4
• BIOL 486 - Molecular Biology and Biotechnology Laboratory Credits: 2

8 credits of biology electives chosen from:

• BIOL 322 - Developmental Biology Credits: 4
• BIOL 402 - Applied and Industrial Microbiology Credits: 3
• BIOL 403 - Techniques in Applied and Industrial Microbiology Credits: 1
• BIOL 452 - Immunology Credits: 3
• BIOL 453 - Immunology Laboratory Credits: 1
• BIOL 563 - Virology Credits: 3
• BIOL 568 - Advanced Topics in Molecular Genetics Credits: 3
• BIOL 575 - Selected Topics in Genetics Credits: 1-4
• BIOL 580 - Computer Applications for the Life Sciences Credits: 3

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

At least 6 credits chosen from:

• MATH 110 - Introductory Probability and Statistics 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
3 credits of computer science:

- IT 103 - Introduction to Computing Credits: 3

▲ 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 must fulfill all requirements for bachelor’s degrees including university general education requirements. In addition, students must complete the following. (Through the course work below, they satisfy the university-wide general education requirements in natural science, quantitative reasoning, and information technology proficiency.)

37 credits of biology core courses:

- BIOL 213 - Cell Structure and Function Credits: 4
- BIOL 303 - Animal Biology Credits: 4
- BIOL 304 - Plant Biology Credits: 4
- BIOL 305 - Biology of Microorganisms Credits: 3
- BIOL 306 - Biology of Microorganisms Laboratory Credits: 1
- BIOL 307 - Ecology Credits: 4
- BIOL 311 - General Genetics Credits: 4
- BIOL 309 - Introduction to Oceanography Credits: 3
- BIOL 350 - Freshwater Ecosystems Credits: 4
- BIOL 449 - Marine Ecology Credits: 3
- EVPP 421 - Marine Conservation Credits: 3

6 credits of biology electives chosen from:

- BIOL 331 - Invertebrate Zoology Credits: 4
- BIOL 440 - Field Biology Credits: 1-4
- BIOL 472 - Introductory Animal Behavior Credits: 3
- BIOL 473 - Introductory Laboratory in Animal Behavior Credits: 1
- BIOL 536 - Ichthyology Credits: 4
- EVPP 363 - Coastal Morphology and Processes Credits: 4
- EVPP 419 - Marine Mammal Biology and Conservation Credits: 3
- NCLC 318 - Exploring Virginia's Watersheds Credits: 4

29 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
- 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

At least 6 credits chosen from:

- MATH 110 - Introductory Probability and Statistics 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

3 credits of computer science:

- IT 103 - Introduction to Computing Credits: 3

Note:

PHED 255 is strongly recommended but not required.

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 a 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 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- to 400-level biology or chemistry course work taken at Mason. Students may present no more than 6 credits of D grades in biology and chemistry courses required in the three years of preprofessional 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 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 program director.

Students must fulfill all requirements for bachelor’s degrees including university general education requirements*. In addition, candidates must complete MTCH 200 and present the following courses in their preprofessional programs with a minimum GPA of 2.00. (Through the course work below, majors satisfy the university-wide general education requirements in natural science, quantitative reasoning, and information technology proficiency.)

*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.

Degree Requirements

Biology:

Minimum 20 credits, including:

- BIOL 213 - Cell Structure and Function Credits: 4
- BIOL 303 - Animal Biology Credits: 4
- BIOL 305 - Biology of Microorganisms Credits: 3
- BIOL 306 - Biology of Microorganisms Laboratory Credits: 1
- BIOL 311 - General Genetics Credits: 4
- BIOL 452 - Immunology Credits: 3
- BIOL 453 - Immunology Laboratory Credits: 1

Chemistry:

Minimum 18 credits, including:

- 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:
Minimum 6 credits; STAT 250 or BIOL 312 recommended, MATH 106 not applicable.

Computer skills:

- IT 103 - Introduction to Computing Credits: 3

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

Course Work

Candidates for the minor in biology must complete 19 to 20 credits in biology with a minimum GPA of 2.00, including:

- BIOL 213 - Cell Structure and Function Credits: 4
- BIOL 303 - Animal Biology Credits: 4
- BIOL 304 - Plant Biology Credits: 4
- BIOL 307 - Ecology Credits: 4
  or
- BIOL 311 - General Genetics Credits: 4
- one other 3- to 4-credit biology course at the 300, 400, or 500 level (not BIOL 301).
Note:

Eight credits of course work must be unique to the minor. For policies governing all minors, see the Academic Policies chapter of this catalog.

Total: 19-20 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, 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, 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.

■ Chemistry and Biochemistry

Phone: 703-993-1070
Web: chemistry.gmu.edu

Faculty

Professors: Cozzens, Davies, Foster (chair), Mose, Mushrush

Associate professors: Born, Honeychuck, Hussam, Schreifels, Slayden, Weatherspoon (associate chair)

Term associate professor: Hatton

Assistant professors: Bishop, Cooper, Couch

Term assistant professors: Kort, 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, 337, 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 degrees in environmental science and policy, bioscience, and physical sciences. An area of emphasis in computational chemistry is available through the PhD in computational sciences and informatics program offered in conjunction with the Department of Computational and Data 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 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

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 and the following. (Through the course work below, chemistry majors satisfy the university-wide general education requirements in natural science and quantitative reasoning.)

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

8–12 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
- PHYS 262 - University Physics III Credits: 3
- PHYS 263 - University Physics III Laboratory Credits: 1

▲ Concentration in Biochemistry (BC)

This program is 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 must complete the following. (Through the course work below, 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 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

**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.

Students must fulfill all requirements for bachelor’s degrees including university general education requirements. In addition, students majoring in chemistry must complete the following with a minimum GPA of 2.00. No more than two courses with a grade of D (1.00) may be applied to the major. (Through the course work below, chemistry majors satisfy the university-wide requirements in natural science, information technology, and quantitative reasoning.)

**Degree Requirements**

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 350 - Computer Techniques for Chemistry Credits: 3
- CHEM 422 - Instrumental Analysis Credits: 3
- CHEM 423 - Instrumental Analysis Laboratory Credits: 2
- CHEM 441 - Properties and Bonding of Inorganic Compounds Credits: 3
- CHEM 445 - Inorganic Preparations and Techniques Credits: 2
• CHEM 463 - General Biochemistry I Credits: 4
• and 3 credits of electives in chemistry.

14 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
• MATH 214 - Elementary Differential Equations Credits: 3

8–12 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
• PHYS 262 - University Physics III Credits: 3
• PHYS 263 - University Physics III Laboratory Credits: 1

▲ 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 with a minimum GPA of 2.00. No more than two courses with a grade of D (1.00) may be applied to the major. (Through the course work below, they satisfy the university-wide requirements in natural science and quantitative reasoning.)

42 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 350 - Computer Techniques for Chemistry Credits: 3
• 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

8–12 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
• PHYS 262 - University Physics III Credits: 3
• PHYS 263 - University Physics III 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 degree is approved by the American Chemical Society and leads to state licensure to teach in Virginia on completion of the degree.
Students must fulfill all requirements for bachelor’s degrees including university general education requirements. In addition, students majoring in chemistry education must present the following:

41 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
  or
- CHEM 333 - Physical Chemistry for the Life Sciences I Credits: 3

- CHEM 336 - Physical Chemistry Lab I Credits: 2
  or
- CHEM 465 - Biochemistry Lab Credits: 2

- CHEM 350 - Computer Techniques for Chemistry Credits: 3
- CHEM 446 - Bioinorganic Chemistry Credits: 3
- CHEM 463 - General Biochemistry I Credits: 4
- 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

8–12 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
- PHYS 262 - University Physics III Credits: 3
- PHYS 263 - University Physics III Laboratory Credits: 1
8 credits of other general science:

- BIOL 103 - Introductory Biology I Credits: 4
  or
- BIOL 213 - Cell Structure and Function Credits: 4
- GEOL 101 - Introductory Geology I 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.

**Bachelor's Level Certificate**

**Environmental Chemistry Undergraduate Certificate**

**Banner Code:** SC-CERB-EVCH

The department offers an undergraduate certificate program in environmental chemistry. The program consists of 35 credits of course work dealing directly with environmental studies. To receive the certificate, students must hold a baccalaureate degree in any major or be earning one from Mason at the time they receive the certificate.

**Certificate Requirements**

Substitutions from the following list of required courses are allowed but require permission from the environmental chemistry certificate director:

- BIOL 377 - Applied Ecology Credits: 3
- 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
or
• CHEM 333 - Physical Chemistry for the Life Sciences I Credits: 3

• CHEM 505 - Hazardous Materials Waste Management Credits: 1-3
• CHEM 554 - Geochemistry of Environmental Hazards Credits: 3
• STAT 344 - Probability and Statistics for Engineers and Scientists I Credits: 3
• electives (approved by certificate director) to bring the total to 35 credits

Note:

To optimize employment and graduate school opportunities, students are encouraged to take additional courses in natural science, computer science, and environmental law.

Total: 35 credits

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.

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 can enter this program after completing 90 credits and enroll in graduate courses when they have successfully completed prerequisites. 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.

Admitted students are able to use up to 6 graduate credits in partial satisfaction of the requirements for the undergraduate degree. On completion of that 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.

Master's Degree

Chemistry, MS

Banner Code: SC-MS-CHEM

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.

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 for students planning to pursue a doctoral degree or a career in the chemical, biochemical, or pharmaceutical industry. The thesis is based on research that must be preapproved by the thesis or advisory committee, which is appointed during 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 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.

Chemistry Core Course List

All students in the Chemistry MS program take 9 credits of chemistry core courses from the following list. Core courses may also be taken as electives beyond the stated credit requirement for each option:
• CHEM 513 - Synthetic and Mechanistic Organic Chemistry Credits: 3
• CHEM 521 - Theory of Analytical Processes Credits: 3
• CHEM 613 - Modern Polymer Chemistry Credits: 3
• CHEM 614 - Physical Organic Chemistry Credits: 3
• CHEM 617 - Organic Structural Spectroscopy Credits: 3
• CHEM 624 - Principles of Chemical Separation Credits: 3
• CHEM 633 - Chemical Thermodynamics and Kinetics Credits: 3
• CHEM 646 - Bioinorganic Chemistry Credits: 3
• CHEM 651 - Environmental Chemistry of Organic Substances Credits: 3
• CHEM 732 - Quantum Chemistry Credits: 3

Thesis Option, Chemistry

This program is specifically designed for students who wish to pursue a doctoral degree or a career in the chemical industry. Students must complete the following requirements:

Chemistry Core Courses (12 credits):

• CHEM 633 - Chemical Thermodynamics and Kinetics Credits: 3
• plus 9 credits of additional courses from the Chemistry Core Course List

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

Nonthesis Option, Chemistry

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. Students must complete the following requirements:

Chemistry Core Courses (12 credits):
• CHEM 633 - Chemical Thermodynamics and Kinetics Credits: 3
• plus 9 credits of additional courses from the Chemistry Core Course List

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

▲ Concentration in Biochemistry (BC)

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. Students must complete the following requirements:

Chemistry Core Courses (12 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
• plus 9 credits of additional courses from the Chemistry Core Course List

Biochemistry Electives (6 credits):

• 6 credits of electives in biochemistry (see the department for the list of approved courses)

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

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. Students must complete the following requirements:

Chemistry Core Courses (12 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
• plus 9 credits of additional courses from the Chemistry Core Course List

Biochemistry Electives (9 credits):

• 9 credits of electives in biochemistry (see the department for the list of approved courses)

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
Doctoral Degree

Chemistry and Biochemistry, PhD (pending SCHEV approval)

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, followed by an independent research project 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 (thesis).

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.

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 advising to the student.

The program requires 72 total credits of coursework and dissertation (thesis). 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. By the end of their first year, all students will pair with a faculty advisor who will guide them toward candidacy. A student may choose up to 30 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. Students are also required to take 3 credits of Graduate Seminar (CHEM 790).

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.

Advancement to Candidacy
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 separate written and oral candidacy examinations prepared and administered 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 Dissertation**

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) 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**

**Physical Sciences, PhD**

*Banner Code: SC-PHD-PSCI*

This interdisciplinary doctoral program is offered by the Department of Physics and Astronomy and the Department of Chemistry and Biochemistry. The degree focuses on preparing scientists in the separate disciplines listed above or as members of interdisciplinary science teams, primarily involving astronomy, biochemistry and biophysics, chemistry, and physics. The main emphasis is on theoretical, experimental, or laboratory research. The program is not intended to produce graduates who are scientific generalists; however, the areas of specialization often cut across traditional disciplines, as in the research fields mentioned above.

The degree is built on a foundation of several interdisciplinary courses that expose students to fundamental research problems in modern science and provide them with an introduction to each of the general areas that compose the degree (physics, chemistry, biochemistry and biophysics, and astronomy). The program curriculum, however, has been designed to provide enough flexibility to accommodate students seeking a fully interdisciplinary program, as well as those with interests more closely aligned with one of the traditional physical science disciplines. Students who seek a program with a heavy emphasis on computational methods may alternatively consider the doctoral program in computational sciences. This program includes concentrations in computational physics and space sciences and computational astrophysics. See the Department of Computational and Data Sciences section for degree and admission requirements.

**Admission Requirements**

The physical sciences PhD program is intended for students who (1) have completed an undergraduate program of study in one of the physical sciences, (2) have taken math to the level of differential equations, and (3) are computer literate.

Applicants are expected to have a BS degree with minimum GPA of 3.00 and acceptable GRE and TOEFL scores. The undergraduate degree should be in a scientific field, such as physics, chemistry, astronomy, mathematics, or engineering. Applicants with insufficient undergraduate records may be accepted provisionally and required to successfully complete selected remedial courses, some of which may not be applicable to the 48-credit total for the PhD course work requirement.
Interested students should submit a completed Mason graduate application, three letters of recommendation, official reports of GRE and TOEFL scores, and a goals statement reflecting their general research interests and career plans. Mason’s Educational Testing Service code is 5827.

Degree Requirements

Students must satisfy all requirements for doctoral degrees expressed in the Academic Policies section of this catalog.

The Physical Sciences, PhD program requires 72 credits beyond the baccalaureate degree. All students in the physical sciences PhD program are required to take 48 credits of course work and 24 credits of dissertation research. For students entering the doctoral program with previous graduate work, the 48 credits of course work may be reduced by a maximum of 30 credits. Of the 48 credits of course work, 9 credits will consist of core courses to be taken by all students in the program, and at least 15 hours will be selected as part of a student’s contract with a three-member faculty committee (explained below). At least five of the contract core courses will be selected from the list presented below. Thus, the program consists of:

- a minimum of 15 credits of course work chosen as part of a contract
- up to 24 credits of electives (approved by committee)
- 24 credits of dissertation research

- PSCI 703 - Frontiers of Physical Sciences Credits: 1 (a 1-credit course that must be repeated three times)

Additional Information

A three-member predissertation faculty committee will be formed by the student as soon as possible after admission but not later than after completion of the 9-credit core. The composition of the student’s committee must be approved by the program director. At this point, the student is expected to have selected a rather broad area of future research interest; typically, the area may not yet be specific enough to define an actual dissertation project.

Because students entering the program will have diverse backgrounds and goals and the program is explicitly designed to accommodate students preparing for a range of fields of research, it is not possible to have a completely standardized set of degree requirements. Instead, the student and his or her committee will decide on a set of at least five courses (15 credits) that will best meet the student’s goals and future research direction. This portion of the program will be set up in the form of a contract between the student and the committee. The contract will include courses that the student should take and books and articles that should be read. Fifteen of the contract credits must be chosen from the following list; however, no more than three classes can be taken in any one area, unless the student obtains special permission from the program director. Furthermore, no more than two classes at the 500 level can be selected.

Astronomy courses:

- ASTR 530 - Astrophysics Credits: 3
- ASTR 766 - Relativity and Cosmology Credits: 3

Biochemistry and biophysics courses:

- 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

Chemistry courses:

• CHEM 617 - Organic Structural Spectroscopy Credits: 3
• CHEM 625 - Electroanalytical Chemistry Credits: 3
• CHEM 633 - Chemical Thermodynamics and Kinetics Credits: 3
• CHEM 651 - Environmental Chemistry of Organic Substances Credits: 3

Physics courses:

• PHYS 684 - Quantum Mechanics I Credits: 3
• PHYS 685 - Classical Electrodynamics I Credits: 3
• PHYS 705 - Classical Mechanics Credits: 3
• PHYS 784 - Quantum Mechanics II Credits: 3
• PHYS 785 - Classical Electrodynamics II Credits: 3

Interdisciplinary courses:

• PHYS 510 - Computational Physics I Credits: 3
• PHYS 512 - Solid State Physics and Applications Credits: 3
• PHYS 533 - Modern Instrumentation Credits: 3
• PHYS 575 - Atmospheric Physics I Credits: 3
• PHYS 701 - Theoretical Physics Credits: 3
• PHYS 711 - Statistical Mechanics Credits: 3
• ASTR 760 - Space Plasma Physics Credits: 3
• ASTR 765 - High-Energy and Accretion Astrophysics Credits: 3
• CHEM 563 - General Biochemistry I Credits: 3
• CHEM 564 - General Biochemistry II Credits: 3
• CHEM 728 - Introduction to Solid Surfaces Credits: 3
• CHEM 732 - Quantum Chemistry Credits: 3

Electives

Students can choose their elective classes more widely, but these courses need to be approved by the faculty committee in order to be applied toward satisfaction of the degree requirements. As an example, a student planning to pursue interdisciplinary research in the general area of bioinorganic chemistry would form a committee headed by a bioinorganic scientist and would have a contract that probably required taking at least these five courses:

• CHEM 617 - Organic Structural Spectroscopy Credits: 3
• CHEM 633 - Chemical Thermodynamics and Kinetics Credits: 3
• CHEM 646 - Bioinorganic Chemistry Credits: 3
• CHEM 660 - Protein Biochemistry Credits: 3
• CHEM 662 - Modern Methods of Drug Discovery Credits: 3
Additional Information

The contract is an interactive document agreed to between the student and the committee. It can be revised, but any revisions must be approved by the program director. For purposes of the written preliminary exam, the scope of the contract will be narrowed to cover particular courses, books, and such as the committee sees fit. The final contract must be signed by the student and by all committee members.

Students are encouraged to undertake research under close faculty supervision in a number of potential areas, including the following examples:

- Analysis of complex dynamical systems
- Studies of the role of greenhouse gases in Earth’s atmosphere
- Modeling astrochemical processes in star-forming regions
- Searches for extrasolar planets
- Modeling the production of high-energy gamma rays from cosmic sources
- Analysis and prediction of space weather
- Quantum computation: theory and applications
- Solid state physics, including applications to materials science
- Interaction of organic molecules with solid surfaces

Computational and Data Sciences

Phone: 703-993-3807
Web: cds.gmu.edu

Faculty


Associate professors: Axtell*, Borne, Cebral, Klimov*, Wallin, C. Yang, R. Yang*, Zoltek

Assistant professors: Camelli, Griva, Opher*, Sheng, Tollaksen, Weigel, Zhang

Research professors: Bilitza, Dere, Economou, Gomez, Poland, Titarchuk

Adjuncts: Guharay, Lanzagorta, Veytsman

*Faculty holding primary appointments in other departments.

Course Work

The department offers all course work designated CDS, CSI, CSS, and NANO in the Courses chapter of this catalog.

Undergraduate Degree
Computational and Data Sciences, BS

Banner Code: SC-BS-CDS

The BS degree in computational and data sciences 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 computational and data sciences 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 BS degree in Computational and Data Sciences Program.

Students must fulfill all requirements for bachelor’s degrees including university general education requirements. In addition, students must complete a total of 18 credits in computational and data sciences core courses, 15 credits in computer science, 23 credits in mathematics, 6 credits in statistics, 21 to 25 credits in a science concentration, and 3 to 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.)

Degree Requirements

Six courses from the computational and data sciences core (18 credits):

- CDS 101 - Introduction to Computational and Data Sciences Credits: 3
- CDS 301 - Scientific Information and Data Visualization Credits: 3
- CDS 302 - Scientific Data and Databases 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

Six required computer science courses (15 credits):

- CS 105 - Computer Ethics and Society Credits: 1
- CS 112 - Introduction to Computer Programming Credits: 4
- CS 211 - Object-Oriented Programming Credits: 3
- CS 261 - Introduction to a Second Language Credits: 1
- CS 367 - Computer Systems and Programming Credits: 3
- CS 483 - Analysis of Algorithms Credits: 3

Seven required mathematics courses (23 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 214 - Elementary Differential Equations Credits: 3  
• MATH 446 - Numerical Analysis I Credits: 3

Two required statistics courses (6 credits):
• STAT 344 - Probability and Statistics for Engineers and Scientists I Credits: 3  
• STAT 354 - Probability and Statistics for Engineers and Scientists II Credits: 3

Science concentration (21–25 credits)

Computational and data sciences electives (3–9 credits)

Concentrations

In meeting the above requirements, students choose a concentration in physics, chemistry, or biology. The courses required for each concentration are listed below. Students should plan a program of study in consultation with their advisor as appropriate for their selected concentration.

▲ 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

▲ 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

▲ 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 three of:

- 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

Undergraduate Minor

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 synthesis courses in computational and data sciences 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 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 computational and data sciences consists of 18 credits of course work.

Course Work

- CS 211 - Object-Oriented Programming Credits: 3
- MATH 446 - Numerical Analysis I Credits: 3

9 credits—from:

- Any CDS or CSI courses

3 credits—from:

- Classes in physics, chemistry, biology, bioinformatics, environmental science and policy, geography, geology, astronomy, or statistics at the 300 level or above. Other discipline-based courses may be permitted with permission of the undergraduate program director.

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.

Total: 18 credits

Master's Degree

Computational Science, MS

Banner Code: SC-MS-COMP

The interdisciplinary 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 course work, with the remaining 21 credits taken in a broad range of scientific areas, including mathematics, physics, chemistry, biology, and statistics. 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.

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 from the computational core (9 credits):

- 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, 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.

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.

Program Requirements

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. Waived credits are to be replaced with applications courses approved by the director of the certificate program.

Certificate Requirements

The required courses may be selected as follows:

6 credits from:

- CSI 601-607

6 credits from:

- CSI 600 - Quantitative Foundations for Computational Sciences Credits: 3
- CSI 610 - Introduction to Computational Sciences Credits: 3
- CSI 700 - Numerical Methods Credits: 3

Elective (3 credits):

- one CSI elective

Total: 15 credits
Nanotechnology and Nanoscience Graduate Certificate

Banner Code: SC-CERG-NANO

This graduate certificate program focuses on mastering a variety of technical skills in the rapidly developing area of nanotechnology. The field highlights the effect of size on the physical and engineering properties of materials and the design of various devices and systems. The certificate enables students to acquire knowledge covering a broad range of instrumentation, modeling, analysis, and production methods that facilitate the solution of practical nanotechnology-related problems in the workplace.

Admission Requirements

Applicants should hold a BS degree in any branch of engineering, physics, chemistry, or materials science, with a minimum GPA of 3.00. Exceptions are reviewed on an individual basis. 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 for all international applicants.

Program Requirements

The certificate program comprises 15 credits of course work designed to provide an accelerated introduction to concepts in nanotechnology and nanoscience. Topics include nanomaterials, nanocharacterization, nanostructures, nanofabrication, nanoelectronics, and modeling for nanoscience. The prefix of the associated courses is NANO.

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.

Certificate Requirements

9 credits of core courses:

- NANO 500 - Introduction to Nanomaterials and Interactions Credits: 3
- NANO 510 - Strategies for Nanocharacterization Credits: 3
- NANO 520 - Survey of Nanostructures Credits: 3

6 credits of electives:

- NANO 530 - Nanofabrication Credits: 3
- NANO 610 - Nanoelectronics Credits: 3
- NANO 620 - Computational Modeling in Nanoscience Credits: 3

Total: 15 credits
Doctoral Degree

Computational Sciences and Informatics, PhD

Banner Code: SC-PHD-CSI

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.

Overview of the CSI Program

Founded in 1992, the innovative Computational Sciences and Informatics (CSI) doctoral program at George Mason University addresses the role of computation in science, mathematics, and engineering. Computational sciences is defined as the development and application of computational methodologies and techniques to the modeling, simulation, and understanding of phenomena in the natural sciences and engineering. Informatics is defined as the design and implementation of complex software systems for the extraction of knowledge from large databases. 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.

Areas of Emphasis within the PhD Program

Research opportunities leading to the doctoral degree are available in each of the following areas of emphasis:

- Computational Fluid Dynamics
- Computational Materials and Chemical Sciences
- Space Sciences and Computational Astrophysics
- Computational Mathematics
- Computational Physics
- Computational Statistics
- Computational Learning
- Quantum Information Science
- Computational Remote Sensing

Students may also pursue interdisciplinary research that combines the areas of emphasis listed above with each other and also with computational neuroscience, climate dynamics, bioinformatics, and remote sensing, which are now separate PhD programs.

The department’s research activities reflect the recognized role of computation as part of a triad with theory and experiment to generate new knowledge and a better understanding of nature. CDS maintains 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.

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.

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:

- 12 credits of core computational courses (scientific computing, databases, visualization)
- 15 credits from courses in one of the science areas
- 18 credits in electives from science courses, with at least 9 credits of CSI courses
- 3 credits in colloquium/seminar
- 24 credits in dissertation research

**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 $50 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 703-993-1988; fax 703-993-9300, or e-mail: blaisten@gmu.edu.

**Degree Requirements**

Students must satisfy all requirements for doctoral degrees expressed in the Academic Policies section of this catalog.

**General core course requirements (12 credits)**
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

**Emphasis core requirements (15 credits)**

In one of the following areas:

**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

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

**Computational Materials and Chemical Sciences**

- CSI 685 - Fundamentals of Materials Science Credits: 3
- CSI 780 - Computational Physics and Applications Credits: 3
- CSI 783 - Computational Quantum Mechanics Credits: 3
- CSI 787 - Computational Materials Science Credits: 3

One from:

- CSI 786 - Molecular Dynamics Modeling Credits: 3
- CSI 789 - Topics in Computational Physics Credits: 3
- CSI 885 - Atomistic Modeling of Materials Credits: 3

**Space Sciences and Computational Astrophysics**
- CSI 782 - Statistical Mechanics for Modeling and Simulation Credits: 3
- PHYS 513 - Applied Electromagnetic Theory Credits: 3

Two from:

- CSI 661 - Astrophysics Credits: 3
- CSI 662 - Space Weather Credits: 3
- CSI 783 - Computational Quantum Mechanics Credits: 3
- PHYS 684 - Quantum Mechanics I Credits: 3

One from:

- CSI 721 - Computational Fluid Dynamics I Credits: 3
- CSI 761 - N-Body Methods and Particle Simulations Credits: 3
- CSI 780 - Computational Physics and Applications Credits: 3
- CSI 788 - Simulation of Large-Scale Physical Systems Credits: 3

Computational Mathematics

- CSI 742 - The Mathematics of the Finite Element Method Credits: 3
- CSI 747 - Nonlinear Optimization and Applications Credits: 3

Three from:

- CSI 740 - Numerical Linear Algebra Credits: 3
- CSI 746 - Wavelet Theory Credits: 3
- CSI 772 - Statistical Learning Credits: 3
- MATH 677 - Ordinary Differential Equations Credits: 3
- MATH 678 - Partial Differential Equations Credits: 3

Computational Physics

- CSI 780 - Computational Physics and Applications Credits: 3
- CSI 783 - Computational Quantum Mechanics Credits: 3

Three from:

- CSI 782 - Statistical Mechanics for Modeling and Simulation Credits: 3
- CSI 786 - Molecular Dynamics Modeling Credits: 3
- CSI 787 - Computational Materials Science Credits: 3
- PHYS 513 - Applied Electromagnetic Theory Credits: 3
• PHYS 684 - Quantum Mechanics I Credits: 3

Computational Statistics

• CSI 771 - Computational Statistics Credits: 3
  or
• CSI 773 - Statistical Graphics and Data Exploration Credits: 3
• CSI 876 - Measure and Linear Spaces Credits: 3
  or
• CSI 877 - Geometric Methods in Statistics 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

Quantum Information Science

• CSI 615 - Quantum Computation Credits: 3
• CSI 715 - Quantum Complexity Theory Credits: 3
• CSI 716 - Quantum Information Theory Credits: 3
• CSI 717 - Quantum Computer Programming Credits: 3
  or
• CSI 718 - Quantum Computer Realization Credits: 3
• CSI 783 - Computational Quantum Mechanics Credits: 3
  or
• PHYS 684 - Quantum Mechanics I Credits: 3

Computational Remote Sensing

Select five courses from:

• EOS 740 - Hyperspectral Imaging Systems Credits: 3
• EOS 747 - Satellite Data Reception and Product Generation Credits: 3
• EOS 753 - Observations of the Earth and Its Climate Credits: 3
• CSI 754 - Earth Science Data and Advanced Data Analysis Credits: 3
• EOS 756 - Physical Principles of Remote Sensing Credits: 3
• CSI 757 - Techniques and Algorithms in Earth Observing and Remote Sensing Credits: 3
• EOS 758 - Earth Image Processing Credits: 3
Electives:

18 credits, with at least 9 credits of CSI courses.

Colloquium/Seminar: 3 credits

3 credits from CSI 898, CSI 899, or CSI 991 (courses may be repeated).

Interdisciplinary Studies

Students may also pursue interdisciplinary research that combines the areas of emphasis listed above with each other and also with Earth systems and geoinformation sciences, computational chemistry, climate dynamics, and bioinformatics, several of which are autonomous PhD programs within COS.

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 Registrar, Certifications Services, at 703-993-2448.

Environmental Science and Policy

Phone: 703-993-1043
Web: esp.gmu.edu

Faculty

Professors: Jones, Lawrey

Term professor: Talbot

Associate professors: Balint, Birchard, Gillevet, Jonas (Chair), Macfarlane, McBride, Rockwood, Torzilli

Assistant professors: Ahn, Crate, Darnall, Edwards, Forkner, Kraus, Manca, Weeks

Term associate professors: Cresseey, Parsons, Sklarew

Term assistant professors: Largen, Peters

Research associate professor: Litchfield

Emeritus professors: Bradley, Ernst, Kelso, Shaffer, Skog
Other Environmental Program Faculty

**Professors:** Black, Chandhoke, Conlan, Diecchio, Foster, Gifford, Haack, Houck, Mose, Mushrush, Nadeau, Regan, Rowan, Sage, Schum, Wan, Willett, Wong

**Associate professors:** Beach, Christensen, Conant, deMonsabert, Fryxell, Guagnano, Honeychuck, Kozlowski, Mahler, McBride, Meyer, Paden, Palkovich, Rodgers, Royt, Seto, Stough, Wood

**Assistant professor:** Kysar-Mattietti, Parker

**Term associate professors:** Verardo

**Term assistant professors:** Nord-Cooper

**Affiliate faculty:** Bailey, Bartoldus, Baxter, Buchino, Burgess, Creque, Croisier, Hamdan, Jordan, Kriechevsky, Lebovitz, Leimgruber, Litchfield, Maldini, Maldonado, Marra, Maurakis, May-Collado, Megonigal, Noe, Oren, Ragen, Rybicki, Seidensticker, Sillett, Sladen, Smith, Songsasen, Strong, Wang

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 Concentration in Environmental Science (EVSC) within the BS in Earth Science degree program is offered by Environmental Science and Policy jointly with the Department of Atmospheric, Oceanic and Earth Sciences. It is intended for
students interested in studying the earth and its environment. Refer to AOES section for more information on the Earth Science, BS degree program and this concentration.

**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.

**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.

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.

**Certificate Requirements**

**Environmental certificate core (four courses):**

Choose one of the following:

- EVPP 377 - Applied Ecology Credits: 3
- BIOL 377 - Applied Ecology Credits: 3
and one of the following:

- GEOG 303 - Conservation of Resources and Environment Credits: 3
- GEOG 503 - Problems in Environmental Management Credits: 3

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

- plus a course in statistics (BIOL 312 Biostatistics recommended)

Physical perspective (one or two courses*):

- 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 - Biogeochemy: A Global Perspective Credits: 3
- GEOG 102 - Physical Geography Credits: 3
- GEOG 309 - Introduction to Meteorology and Climate 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 - Geology of Mineral and Energy Resources Credits: 3

Biological perspective (one or two courses*):

- BIOL 307 - Ecology Credits: 4
- BIOL 309 - Introduction to Oceanography Credits: 3
- BIOL 344 - Taxonomy of Flowering Plants Credits: 4
- BIOL 345 - Plant Communities 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 339 - Vertebrate Natural History Credits: 4
- 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
- GEOG 301 - Political Geography Credits: 3
- GEOG 304 - Geography of Population Credits: 3
- GEOG 305 - Economic Geography Credits: 3
- GEOG 306 - Urban Geography Credits: 3
- GEOG 316 - Geography of Latin America Credits: 3
- GEOG 325 - Geography of North Africa and the Middle East Credits: 3
- GEOG 406 - Suburban Geography 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 course):

- BIOL 312 - Biostatistics Credits: 4
- EVPP 503 - Field Mapping Techniques Credits: 3
- EVPP 555 - Lab in Waterscape Ecology Credits: 1
- GEOG 310 - Introduction to Digital Cartography Credits: 4
- GEOG 311 - Introduction to Geographic Information Systems Credits: 3
- GEOG 411 - Advanced Digital Cartography Credits: 3
• GEOG 412 - Aerial Photography Interpretation Credits: 3
• GEOG 416 - Satellite Image Analysis Credits: 3
• GEOG 463 - Applied Geographic Information Systems Credits: 3
• GEOG 550 - Geospatial Science Fundamentals Credits: 3
• GEOG 553 - Geographic Information Systems Credits: 3
• GEOG 579 - Remote Sensing Credits: 3
• GEOG 580 - Digital Remote Sensing Credits: 3
• GEOG 585 - Quantitative Methods Credits: 3

Note:

* 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.

Total: 27 credits

Undergraduate Minor

Conservation Biology Minor

Banner Code: CBIO

This minor is intended for non-biology majors* with an interest in wildlife and habitat conservation issues. The minor may particularly suit 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.

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 (15 credits)

• BIOL 303 - Animal Biology Credits: 4 **
• BIOL 304 - Plant Biology Credits: 4 **
• BIOL 307 - Ecology Credits: 4 **

and one from the following:

• EVPP 318 - Conservation Biology Credits: 3
• BIOL 318 - Conservation Biology Credits: 3
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 421 - Marine Conservation Credits: 3
- EVPP 490 - Special Topics in Environmental Science and Policy Credits: 1-4
- NCLC 401 - Conservation Biology Credits: 3-15 (3 of 6 credits count toward electives)
- 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. 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 minor cannot be taken by biology majors.

**These courses may have prerequisites that need to be met. See advisor for details.

Total: 21 credits
- EVPP 377 - Applied Ecology Credits: 3
  or
- BIOL 377 - Applied Ecology Credits: 3

- PHIL 343 - Issues in Environmental Ethics 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 - Conservation Biology Credits: 3
  or
- EVPP 318 - Conservation Biology Credits: 3

- BIOL 543 - Tropical Ecosystems Credits: 4
- CEIE 456 - Environmental Law Credits: 3
- EOS 306 - Sustainable Development Credits: 3
- EOS 322 - Issues in the Global Change Credits: 3
- EOS 455 - Environmental Impact Assessment Credits: 3
- EVPP 337 - Environmental Policy Making in Developing Countries Credits: 3
- EVPP 505 - Selected Topics in Environmental Science Credits: 1-4
- GEOG 303 - Conservation of Resources and Environment Credits: 3
- GEOG 399 - Selected Topics in Geography Credits: 3
- 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 - Sociology of Urban Communities 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

**Note:**

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.

**Total: 21 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. This interdisciplinary minor is housed jointly in the Department of Environmental Science and Policy (College of Science) and in the New Century College (College of Humanities and Social Sciences).

For policies governing all minors, see the Academic Policies section of this catalog.

Course Work

Candidates for the minor in Sustainability Studies must complete 16 credits with a minimum GPA of 2.00, distributed as follows:

Core Courses (8 credits):

students take 4 credits of:

- NCLC 275 - Special Topics Credits: 3-15
- plus 4 credits of:
- 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
- CEIE 456 - Environmental Law Credits: 3
- CHEM 155 - Introduction to Environmental Chemistry I Credits: 4
- EOS 121 - Dynamic Atmosphere and Hydrosphere Credits: 4
- EOS 304 - Population Dimensions of Global Change Credits: 3
- EOS 305 - Global Environmental Hazards Credits: 3
- EOS 306 - Sustainable Development Credits: 3
- EOS 312 - Physical Climatology Credits: 3
- EOS 322 - Issues in the Global Change Credits: 3
- EOS 353 - Observations of the Earth and Its Climate Credits: 3
- EOS 455 - Environmental Impact Assessment Credits: 3
- 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
GEOG 303 - Conservation of Resources and Environment Credits: 3
GEOL 305 - Environmental Geology Credits: 3
NCLC 220 - Energy and Environment Credits: 3-15
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 - Issues in Environmental Ethics 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 Management, MEM ■ (pending SCHEV approval)

Banner Code: SC-MEM-EVMG

The Master of Environmental Management (MEM) degree combines the managerial and administrative skills developed in a traditional Master of Public Administration with the scientific knowledge and understanding normally found as a component of a Master of Science degree. The program serves as a terminal professional master’s for those individuals currently working in or aspiring to work as managers in the environmental field in both government and private industry. This degree addresses the needs of professional managers and staff who work at the interface between public administration and environmental science. The MEM is a non-thesis degree that provides balanced training to both full-time and part-time students who seek or currently occupy positions in this growing nexus. The program is offered jointly by the Department of Environmental Science and Policy (ESP) in the College of Science and the Department of Public and International Affairs (PIA) in the College of Humanities and Social Sciences.

Admission Requirements

Applicants should have a bachelor’s degree with an overall GPA of at least 3.0 and should have taken at least two semesters of biology and/or chemistry. Applications are accepted for fall admission only and are due by March 15. All applicants must submit the following materials:

- Complete Application for Graduate Study
• Non-refundable application fee
• Application for Virginia In-State Tuition Rates if seeking in-state tuition
• Two copies of official transcripts from each institution attended
• Three letters of recommendation (at least two of which should be from former professors, job supervisors or others familiar with the applicant’s work)
• A recent resume
• A substantial statement of professional goals and interest in the program. This should also specify whether the student wishes to attend full or part-time.
• Scores from the aptitude portion of the GRE (Applicants with undergraduate GPA of 3.3 or higher may petition for a waiver of GRE requirement)
• International students must also submit an official TOEFL score report

Degree Requirements

This degree is designed to be completed by a full-time student in three semesters, or by part-time student in six semesters. Students must complete a total of 37 credit hours as follows:

Core Courses (18 credits):

• PUAD 502 - Administration in Public and Nonprofit Organizations Credits: 3
• PUAD 640 - Public Policy Process Credits: 3
• PUAD 642 - Environmental Policy Credits: 3
• EVPP 607 - Fundamentals of Ecology Credits: 3
• EVPP 641 - Environmental Science and Public Policy Credits: 3
• PUAD 611 - Problem Solving and Data Analysis I Credits: 3

Environmental Law (3 credits):

• EVPP 670 - Environmental Law Credits: 3
  or
• CEIE 556 - Environmental Law Credits: 3
  or
• PRLS 501 - Introduction to Natural Resources Law Credits: 3

Field Ecology (4 credits):

either the sequence:
• EVPP 550 - Waterscape Ecology and Management Credits: 3
• EVPP 555 - Lab in Waterscape Ecology Credits: 1
or the sequence:
• EVPP 646 - Wetland Ecology and Management Credits: 3
• EVPP 647 - Wetland Ecology Lab and Field Credits: 1

Capstone (3 credits):

• EVPP 677 - Applied Ecology and Ecosystem Management. Credits: 3

Electives (9 credits):

• 9 credits of electives approved by the program director

Total: 37 credits

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.

Four concentrations are available in the master’s program: environmental science and policy, environmental biocomplexity, Earth surface processes and environmental geochemistry, and environmental management. The first three 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 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.
Admission Requirements

Applicants must complete a standard Mason graduate application form, available from the Graduate Admissions Office or online 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

▲ Earth Surface Processes and Environmental Geochemistry Concentration (ESEG)

This concentration is for students desiring an MS degree with an earth science geology theme. 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 the 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’s policy on master’s thesis committees. 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 to provide a breadth of knowledge appropriate for addressing current environmental and earth science issues. Course selection should support the research component of the student’s degree program.

Natural Sciences:

- At least 16 credits are required, including at least one course from each of the following areas (10 of the 16 credits): soils science, hydrogeology, and geochemistry.

The remainder 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: 1-4
- 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:

- At least 6 credits are required in environmental law, human dimension of global change, environmental ethics, human ecology, or planning.

Methods:

- At least 6 credits are required in remote sensing, GIS, statistics, instrumentation, or modeling.

Seminar:

At least 1 credit on an appropriate topic is required.

- EVPP 692 - Master's Seminar in Environmental Science and Public Policy Credits: 1

Research:

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 pass/no credit 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.

Environmental Biocomplexity Concentration (EVBC)

This concentration is for students desiring an MS degree with a environmental biocomplexity theme. 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 the 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 the university. The program requires a minimum of 33 graduate credits distributed in five categories to provide a breadth of knowledge appropriate for addressing current environmental issues. Course selection should support the research component of the student’s degree program.

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:

- 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:

- 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:

- At least 9 credits are required in statistics, bioinformatics, information systems, instrumental analysis, microbiological techniques, molecular methods, and phylogenetic methods.

Seminar:

At least 1 credit on an appropriate topic is required.

- EVPP 692 - Master's Seminar in Environmental Science and Public Policy Credits: 1

Research:

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 requirement 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 electives to bring the total to 33 credits.
Environmental Management Concentration (EVMG)

Students must complete 37 credits for the environmental management concentration. Students will be assigned an advisor on admission. Full-time students can complete this degree in three semesters; part-time students take six semesters. Course work must include the following:

Administration and Policy:

At least 12 credits are required, including the following:

- EVPP 670 - Environmental Law Credits: 3
  or
- PRLS 501 - Introduction to Natural Resources Law Credits: 3
- PUAD 502 - Administration in Public and Nonprofit Organizations Credits: 3
  or
- PUAD 620 - Organization Theory and Management Behavior Credits: 3
- PUAD 640 - Public Policy Process Credits: 3 (with sections tailored to environmental science and policy)
- EVPP 642 - Environmental Policy Credits: 3

Environmental Science:

At least 12 credits are required, including the following:

- EVPP 550 - Waterscape Ecology and Management Credits: 3
  or
- EVPP 646 - Wetland Ecology and Management Credits: 3
- EVPP 607 - Fundamentals of Ecology Credits: 3 (if student has not already taken a course in general ecology)
- EVPP 641 - Environmental Science and Public Policy Credits: 3
- EVPP 677 - Applied Ecology and Ecosystem Management. Credits: 3

Methods and Statistics:

At least 6 credits are required, including the following:

- PUAD 611 - Problem Solving and Data Analysis I Credits: 3 (research design)
- PUAD 612 - Problem Solving and Data Analysis II Credits: 3 (statistics)

Research/Seminar:

Fulfilled with

- EVPP 741 - Advanced Topics in Environmental Science and Public Policy Credits: 1-4 Problems in Environmental Management
Electives:

Students may choose 3 credits (or more to complete 37) from the following list of approved electives. Other courses may be used subject to approval of the program committee.

- 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
- GEOG 550 - Geospatial Science Fundamentals Credits: 3
- PUAD 509 - Justice Organizations and Processes Credits: 3
- PUAD 615 - Administrative Law Credits: 3
- PUAD 622 - Program Planning and Implementation Credits: 3
- PUAD 657 - Association Management Credits: 3
- PUAD 729 - Issues in Public Management Credits: 1-3
- PUAD 741 - Policy Analysis Credits: 3
- PUAD 742 - Program Evaluation Credits: 3
- MBA 623 - Marketing Management Credits: 3
- MBA 712 - Project Management Credits: 3
- MBA 724 - Marketing Communications Credits: 3
- MBA 725 - Leadership Credits: 3

▲ Environmental Science and Policy Concentration (EVSP)

This concentration encourages an independent and creative approach to the development of curricula that reside in the general field of environmental science and policy. 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.

**Natural Sciences:**

- At least 6 credits are required in biology, geology, geography, chemistry, or environmental engineering. For those students without previous course work in ecology, EVPP 607 is required in addition to the 6 credits.
- EVPP 607 - Fundamentals of Ecology Credits: 3

**Public Policy:**

- At least 6 credits are required in environmental law, human ecology, environmental ethics, planning, or public affairs.

**Methods and Statistics:**

- At least 9 credits are required in statistics, remote sensing, information systems, instrumental analysis, or modeling. A course in statistics is highly recommended.

**Seminar:**

At least 1 credit on an appropriate topic is required.

- EVPP 692 - Master's Seminar in Environmental Science and Public Policy Credits: 1

**Research:**

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 requirement 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 electives to bring the total to 33 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.

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 607 Fundamentals of Ecology 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 semester credits) as specified below:

Environmental certificate core (three courses):

- EVPP 677 - Applied Ecology and Ecosystem Management. Credits: 3
- GEOG 503 - Problems in Environmental Management Credits: 3

One 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 (one 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
- GEOG 570 - The Hydrosphere 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
- GEOG 550 - Geospatial Science Fundamentals Credits: 3
- GEOG 553 - Geographic Information Systems Credits: 3
- GEOG 579 - Remote Sensing Credits: 3
- GEOG 580 - Digital Remote Sensing Credits: 3
- GEOG 585 - Quantitative Methods Credits: 3
- SOCI 531 - Statistical Reasoning Credits: 3

Total: 18 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.

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 (may be waived for applicants with a master’s degree in an appropriate field).
- 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.

Applicants with questions should contact the ESP Graduate Services office (703-993-3187). 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.

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 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. 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 requirements:

Natural Sciences:
At least 12 credits are required in biology, chemistry, environmental science, geology, geography, or environmental engineering.

Public Policy:

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:

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. Course work for the first two categories, with a substantial methods component, may be used to meet some of this requirement, subject to approval of the student’s committee.

Doctoral Seminar:

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 Emphasis:

Beyond the basic 12 hour natural science/public policy requirements, students usually will focus their study either on environmental science or environmental public policy. Those focusing on environmental science should usually take a total of 24 credits in natural science; those focusing on environmental public policy should usually take 24 credits of public policy course work. Previous thesis research courses may not be applied to this degree. See Advisor for further details.

Additional Information:

Before admission to the program, students are responsible for identifying a member of the environmental faculty willing to serve as their advisor. The advisor guides the student through initial course selection. An advisor may be changed by mutual consent of student and advisor, or petition to the graduate program director and the College of Science Dean. 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.

Before the end of the fourth semester of course work, students, in consultation with their advisor should propose a dissertation committee of at least four members, three of whom must be from the Mason graduate faculty with representation from at least two governance units. The dissertation committee is appointed by the Dean of the College of Science. 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.
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. Upon approval of the program of study, completion of all or nearly all course work, successful completion of the qualifying exam, 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

Students must complete a dissertation (12 to 24 credits) by registering for credit in a combination of EVPP 998 and 999. No more than half the credits specified for dissertation credit on the student’s program of study may be taken as EVPP 998, Doctoral Dissertation Proposal. 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.

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.

■ Forensic Science Program

Phone: 703-993-1050
Web: cos.gmu.edu/forensics

Faculty

Director: Whildin

Professors: Foster, Jafri, Mushrush, Willett

Associate professors: Born, Gillevet, Honeychuck, Kinser, Palkovich, Schreifels, Seto

Assistant professors: Couch, Forkner

Adjunct faculty: McClintock, Whildin

The Forensic Science Program is an interdisciplinary academic collaboration between the Department of Chemistry and Biochemistry; the Department of Molecular and Microbiology (MMB); the Department of Environmental Science and Policy (ESP); and the Department of Bioinformatics and Computational Biology (BCB). 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 undergraduate minor in Forensic Science.

Graduate Degree Programs

The Forensic Science Program oversees the MS and Graduate Certificate programs in Forensic Science.

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.

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 (6 credits from the following):

• FRSC 420 - Forensic Toxicology Credits: 3
• FRSC 440 - Forensic Chemistry Credits: 3
• FRSC 460 - Forensic DNA Sciences Credits: 3

Supporting Courses (3 credits from the following):

• PSYC 231 - Social Psychology Credits: 3
• SOCI 301 - Criminology Credits: 3
• ADJ 100 - Introduction to Criminal Justice Credits: 3
• ADJ 400 - Applied Criminal Psychology Credits: 3

Electives (3 credits):

• Students select one additional class from the above lists of Forensic Science Courses and Supporting Courses

Total: 20 credits

Master's Degree

Forensic Science, MS (pending SCHEV approval)

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.

The degree requires 21 credits of core courses covering crime scene analysis and fundamental forensic concepts, and an additional 6-9 credits of forensic science electives. Students also complete either a 3 credit research project or a 6 credit MS thesis for a total of 33 program credits. A unique element of the program is the “Forensics Capstone Course,” which is taken by all students in the program. In this class, students will combine their skills as members of interdisciplinary investigation teams as they analyze “real world” crime scenes.

The curriculum outlined below has been designed to meet the standards of the Forensic Science Education Programs Accreditation Commission (FEPAC) of the American Academy of Forensic Science. 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.

**Admission Requirements**

Applicants to the Forensic Science MS program should hold a BA or BS degree in biology, chemistry, or a related field from an accredited university with a minimum GPA of 3.00. Applicants should submit a completed GMU graduate application, official score reports for the GRE-GEN exam, 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 21 credits of core courses and 9 credits of forensic science electives; those undertaking the 6-credit thesis option take only 6 credits of electives.

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 (21 credits):**

- FRSC 500 - Introduction to Forensic Science Credits: 3
- FRSC 510 - Crime Scene Analysis Credits: 3
- FRSC 520 - Toxicology Credits: 3
- FRSC 530 - Law and Forensic Science Credits: 3
- FRSC 540 - Chemical Analysis Credits: 3
- FRSC 600 - Forensics Seminar Credits: 1 (taken 3 times)
- FRSC 690 - Forensics Capstone Course Credits: 3

**Forensics Electives (6 or 9 credits):**
• FRSC 550 - Issues in Forensic Anthropology Credits: 3
• FRSC 560 - Forensic DNA Sciences Credits: 3
• BINF 630 - Bioinformatics Methods Credits: 3
• BINF 633 - Molecular Biotechnology Credits: 3
• BINF 639 - Introduction to Biometrics Credits: 3
• BIOS 740 - Laboratory Methods in Functional Genomics and Biotechnology Credits: 3
• BIOS 743 - Genomics, Proteomics, and Bioinformatics Credits: 3
• BIOS 761 - Dispersal Patterns of Biological Agents Credits: 3
• JLCP 760 - Crime and Crime Policy Credits: 3

Research Component (3 or 6 credits):

Students completing the 6 credit thesis option take only 6 credits of Forensics Electives.

• FRSC 610 - Forensics Research Project Credits: 1-3
• FRSC 799 - Master’s Thesis Credits: 1-6
  Note: students completing the 6 credit thesis option take only 6 credits of electives

Total: 33 credits

Master's Level Certificate

Forensics Graduate Certificate

Banner Code: SC-CERG-FORS

This collegewide 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.

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 COS Fairfax Campus 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.

**Program 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. This unique course will demonstrate in practice how students with skills in the scientific/quantitative analysis or legal/anthropological areas can combine forces to understand and interpret the nuances of the evidence presented at an actual crime scene. The curriculum requirements for each concentration are listed below:

**Certificate Requirements**

- FRSC 500 - Introduction to Forensic Science Credits: 3
- FRSC 510 - Crime Scene Analysis Credits: 3

▲ **Forensic Science Concentration (FRSC)**

**Required Courses (12 credits):**

- FRSC 520 - Toxicology Credits: 3
- FRSC 540 - Chemical Analysis 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, Di, Falconer, Haack, Taylor, Waters, Wong
Associate professors: Beach, Chiu, Curtin, Houser, Qu, Stefanidis, R. Yang
Assistant professors: Cervone, Kronenfeld, Leslie, Manca, Rice, Sun, C. Yang, W. Yang, Zolnik
Research or contract professors: Gomez, Pilon, Self
Term instructors: Boudinot, Hallden

Course Work

This department offers all courses designated EOS and GEOG 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 GEOG 415. Students majoring in Global and Environmental Change fulfill this requirement by successfully completing EOS 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 geography courses with a minimum GPA of 2.00 in addition to 18 credits of electives.

Degree Requirements

Core courses (16 credits):

- GEOG 102 - Physical Geography Credits: 3
- GEOG 103 - Human Geography Credits: 3 (GEOG 103 fulfills the university requirement in social science)
- GEOG 300 - Quantitative Methods for Geographical Analysis Credits: 3
- GEOG 310 - Introduction to Digital Cartography Credits: 4
- GEOG 415 - Seminar in Geography Credits: 3

Systematics, applications, and regional courses (12 credits):

Choose from the following:

- GEOG 301 - Political Geography Credits: 3
- GEOG 303 - Conservation of Resources and Environment Credits: 3
- GEOG 304 - Geography of Population Credits: 3
- GEOG 305 - Economic Geography Credits: 3
- GEOG 308 - Field Mapping Techniques Credits: 3
- GEOG 311 - Introduction to Geographic Information Systems Credits: 3
- GEOG 412 - Aerial Photography Interpretation Credits: 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.

Degree Requirements

46 credits in geography, including:

16 credits of core courses:

- GEOG 102 - Physical Geography Credits: 3
- GEOG 103 - Human Geography Credits: 3 (fulfills the university requirement in social science)
- GEOG 300 - Quantitative Methods for Geographical Analysis Credits: 3
- GEOG 310 - Introduction to Digital Cartography Credits: 4
- GEOG 415 - Seminar in Geography Credits: 3

12 credits of systematic and regional courses, chosen from:

(Some of the regional courses fulfill the college-level, non-Western culture requirement.)

- GEOG 301 - Political Geography Credits: 3
- GEOG 303 - Conservation of Resources and Environment Credits: 3
- GEOG 304 - Geography of Population Credits: 3
- GEOG 305 - Economic Geography Credits: 3
- Regional GEOG courses at the 300 level or above

12 credits of applications and regional courses:
• GEOG 311 - Introduction to Geographic Information Systems Credits: 3
• GEOG 411 - Advanced Digital Cartography Credits: 3
• GEOG 412 - Aerial Photography Interpretation Credits: 3
and one of the following two courses:
• GEOG 416 - Satellite Image Analysis Credits: 3
  or
• GEOG 463 - Applied Geographic Information Systems Credits: 3

6 credits of electives:

• 6 additional credits of geography electives, which may also include an internship (GEOG 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
  (fulfills the university quantitative reasoning requirement)
• STAT 250 - Introductory Statistics I Credits: 3
• IT 103 - Introduction to Computing Credits: 3
  (fulfills the university information technology proficiency requirement)
  plus either:
• GEOL 101 - Introductory Geology I Credits: 4
• GEOL 102 - Introductory Geology II Credits: 4
• GEOL 317 - Geomorphology Credits: 4
  or
• BIOL 103 - Introductory Biology I Credits: 4
• BIOL 104 - Introductory Biology II Credits: 4
• BIOL 377 - Applied Ecology Credits: 3
  (fulfills the university general education requirement in natural science)

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).

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:
Degree Requirements

Two required ecosphere core courses (8 credits):

- students take either the EOS sequence:
  - EOS 121 - Dynamic Atmosphere and Hydrosphere Credits: 4
  - EOS 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):

- EOS 304 - Population Dimensions of Global Change Credits: 3
- EOS 353 - Observations of the Earth and Its Climate Credits: 3
- EOS 305 - Global Environmental Hazards Credits: 3
  or
- GEOL 305 - Environmental Geology Credits: 3
- GEOG 300 - Quantitative Methods for Geographical Analysis Credits: 3
  or
- BIOL 312 - Biostatistics Credits: 4

Four required courses in geosphere and atmosphere (13-14 credits):

- 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:

- EOS 310 - Severe and Unusual Weather Credits: 3
- EOS 312 - Physical Climatology Credits: 3
- EOS 320 - Air Pollution Credits: 3
- GEOG 309 - Introduction to Meteorology and Climate Credits: 3
- GEOG 399 - Selected Topics in Geography Credits: 3
- GEOL 317 - Geomorphology Credits: 4
- GEOL 306 - Soil Science Credits: 3
- GEOL 309 - Introduction to Oceanography Credits: 3
- EVPP 490 - Special Topics in Environmental Science and Policy Credits: 1-4
Four required courses in ecosphere and sociosphere (12-13 credits):

Choose either
- EVPP 377 - Applied Ecology Credits: 3
  or
- EOS 321 - Biogeography: Space, Time and Life Credits: 3
  plus 1 of these three courses
- GLOA 101 - Introduction to Global Affairs Credits: 3
- GEOG 101 - Major World Regions Credits: 3
- CEIE 100 - Environmental Engineering around the World Credits: 3
  and 1 of these two courses
- GEOG 103 - Human Geography Credits: 3
- ANTH 135 - Becoming Human: Evolution, Cognition, and Culture Credits: 3

and 1 from:
- BIOL 318 - Conservation Biology Credits: 3
- BIOL 345 - Plant Communities Credits: 4
- BIOL 449 - Marine Ecology Credits: 3
- EOS 322 - Issues in the Global Change Credits: 3
- EOS 306 - Sustainable Development Credits: 3
- EVPP 336 - Human Dimensions of the Environment Credits: 3
- EVPP 337 - Environmental Policy Making in Developing Countries Credits: 3
- EVPP 350 - Freshwater Ecosystems Credits: 4
- GEOG 303 - Conservation of Resources and Environment Credits: 3

Two required courses in applications and techniques of detecting global change, choose two from (6 credits):

- EOS 303 - GIS Applications for Earth Systems Credits: 3
- EOS 354 - Data Analysis and Global Change Detection Techniques Credits: 3
- EOS 410 - Introduction to Hyperspectral Imaging Credits: 3
- EOS 455 - Environmental Impact Assessment Credits: 3
- EOS 495 - Senior Research Credits: 3
- GEOG 412 - Aerial Photography Interpretation Credits: 3
- GEOG 416 - Satellite Image Analysis Credits: 3
- GEOG 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):

  take one of the sequences
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)

Note:

In meeting the above requirements, students may choose a focus in environmental or global change.

Undergraduate Minor

Geographic Information Systems Minor

Banner Code: GIS

Course Work
To receive this minor, students must complete 18 or 19 credits in geography beyond the prerequisite of GEOG 102 or 103, with a minimum GPA of 2.00:

**Four required courses (12 credits):**

- GEOG 110 - Maps and Mapping Credits: 3
- GEOG 300 - Quantitative Methods for Geographical Analysis Credits: 3
- GEOG 311 - Introduction to Geographic Information Systems Credits: 3
- GEOG 463 - Applied Geographic Information Systems Credits: 3

**Two elective courses chosen from (6–7 credits):**

- GEOG 310 - Introduction to Digital Cartography Credits: 4
- GEOG 411 - Advanced Digital Cartography Credits: 3
- GEOG 412 - Aerial Photography Interpretation Credits: 3
- GEOG 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. Eight credits of course work must be unique to the minor. For policies governing all minors, see the Academic Policies chapter of this catalog.

**Total: 18-19 credits**

**Geography Minor**

**Banner Code: GEOG**

**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):**

- GEOG 102 - Physical Geography Credits: 3 (nonlaboratory natural science credit)
- GEOG 101 - Major World Regions Credits: 3 (fulfills the university requirement in global understanding)
- GEOG 103 - Human Geography Credits: 3 (fulfills the university requirement in social science)
Four additional courses (12 credits):

Classes at the 300 and 400 level, including one systematic course and one regional course from the following lists.

**Systematic:**
- GEOG 301 - Political Geography Credits: 3
- GEOG 303 - Conservation of Resources and Environment Credits: 3
- GEOG 304 - Geography of Population Credits: 3
- GEOG 305 - Economic Geography Credits: 3
- GEOG 306 - Urban Geography Credits: 3
- GEOG 309 - Introduction to Meteorology and Climate Credits: 3

**Regional:**
- GEOG 315 - Geography of the United States Credits: 3
- GEOG 316 - Geography of Latin America Credits: 3
- GEOG 320 - Geography of Europe Credits: 3
- GEOG 325 - Geography of North Africa and the Middle East Credits: 3
- GEOG 330 - Geography of the Soviet Succession States Credits: 3
- GEOG 333 - Issues in Regional Geography Credits: 1-6
- GEOG 380 - Geography of Virginia Credits: 3

**Note:**

For policies governing all minors, see the Academic Policies section of this catalog.

Total: 18 credits

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**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.

**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:

- CSI 655 - Atmospheric Physics I Credits: 3
  or
- PHYS 575 - Atmospheric Physics I Credits: 3
- EOS 656 - The Hydrosphere Credits: 3
  or
- EVPP 652 - The Hydrosphere Credits: 3
- EOS 657 - The Lithosphere Credits: 3
  or
- GEOL 601 - The Lithosphere Credits: 3

### 3 credits of Earth observation courses:

- EOS 753 - Observations of the Earth and Its Climate Credits: 3
  or
- GEOG 579 - Remote Sensing Credits: 3

### 3 credits of quantitative techniques courses:

- CSI 654 - Data and Data Systems in the Physical Sciences Credits: 3
- EOS 754 - Earth Science Data and Advanced Data Analysis Credits: 3
  or
- GEOG 585 - Quantitative Methods Credits: 3

### 3 credits of human and biological perspectives courses, one of:

- EOS 704 - Spatial Analysis and Modeling of Population Credits: 3
- EOS 721 - Biogeography Credits: 3
- EVPP 577 - Biogeochemistry: A Global Perspective Credits: 3
• EVPP 636 - Gender, Race, and the Natural World Credits: 3
• GEOG 575 - Reconstructing Past Environments: Seminar in Geoarchaeology Credits: 3

3 credits of colloquium/seminar:

• EOS 792 - Seminar in Earth Systems Science Credits: 2
• EOS 900 - Research Colloquium in Earth Systems and Geoinformation Sciences Credits: 1

3–6 credits of research:

• EOS 798 - Research Project Credits: 3
  or
• EOS 799 - Master's 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.

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 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.

Degree Requirements

Students must complete 30 graduate credits to include 3 to 6 credits of thesis or 36 graduate credits without a thesis. If the nonthesis option is selected, students are required to pass a comprehensive exam.

Four required courses (12 credits):

- GEOG 553 - Geographic Information Systems Credits: 3
- GEOG 579 - Remote Sensing Credits: 3
- GEOG 585 - Quantitative Methods Credits: 3
- GEOG 680 - Seminar in Thought and Methodology Credits: 3

Thesis or Comprehensive Exam:

- 3–6 credits of thesis (thesis option)
- Comprehensive exam (nonthesis option)

Electives (12–24 credits):

- 12–15 credits (thesis option) of elective courses in geography
  or
- 24 credits (nonthesis option) of elective courses in geography

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 ■ (pending SCHEV approval)

Banner Code: SC-MS-GEOI
The new MS program in geoinformatics and geospatial intelligence (GGI) 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.

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 GGI 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 GGI 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):**

- GEOG 550 - Geospatial Science Fundamentals Credits: 3
- GEOG 553 - Geographic Information Systems Credits: 3
- GEOG 664 - Spatial Data Structures Credits: 3
- EOS 684 - Selected Topics in Geospatial Intelligence Credits: 3
- EOS 685 - Capstone Course in Geoinformatics Credits: 3
- EOS 758 - Earth Image Processing Credits: 3
- EOS 787 - Scientific Data Mining for Geoinformatics Credits: 3

**Thesis (3 credits):**

- EOS 799 - Master's 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:**

- GEOG 562 - Photogrammetry Credits: 3
- GEOG 579 - Remote Sensing Credits: 3
- EOS 740 - Hyperspectral Imaging Systems Credits: 3
- EOS 759 - Topics in Earth Systems Science Credits: 3
- EOS 760 - Advanced Remote Sensing Applications Credits: 3

**Geographic Information Science (GIS):**

- GEOG 533 - Issues in Regional Geography Credits: 1-6
- GEOG 631 - Spatial Agent-based Models of Human-Environment Interactions Credits: 3
- GEOG 653 - Geographic Information Analysis Credits: 3
- GEOG 795 - Seminar in Regional Analysis Credits: 3
- EOS 771 - Algorithms and Modeling in GIS Credits: 3
- EOS 772 - Distributed Geographic Information Systems Credits: 3
- EOS 791 - Advanced Spatial Statistics Credits: 3

**Computational Geoinformatics:**

- EOS 650 - Introduction to GIS Algorithms and Programming Credits: 3
- EOS 754 - Earth Science Data and Advanced Data Analysis Credits: 3
- EOS 771 - Algorithms and Modeling in GIS Credits: 3
- EOS 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.
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 GEOG 550 prior to admission to the program.

Certificate Requirements

Students must successfully complete 15 graduate credits, distributed as follows:

9 credits of required core courses:

- GEOG 553 - Geographic Information Systems Credits: 3
  or
- CEIE 510 - Geographic Information Systems in Engineering Credits: 3

- GEOG 563 - Advanced Geographic Information Systems Credits: 3
  or
- EOS 771 - Algorithms and Modeling in GIS Credits: 3

- GEOG 653 - Geographic Information Analysis Credits: 3

6 credits of electives chosen from:

- GEOG 505 - Transportation Geography Credits: 3
- GEOG 531 - Land-Use Modeling Techniques and Applications Credits: 3
- GEOG 556 - Automated Cartographic Generalization Credits: 3
- GEOG 655 - Map Design Credits: 3
- GEOG 664 - Spatial Data Structures Credits: 3
- EOS 772 - Distributed Geographic Information Systems Credits: 3
- EOS 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
- INFS 795 - Special Topics in Data Mining Applications 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.

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:

- EOS 758 - Earth Image Processing Credits: 3
- GEOG 553 - Geographic Information Systems Credits: 3
- INFS 519 - Program Design and Data Structures Credits: 3
- EOS 684 - Selected Topics in Geospatial Intelligence Credits: 3
- EOS 685 - Capstone Course in Geoinformatics 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 in Remote Sensing and Earth Image Processing 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 certificate requires students to complete 15 credits of EOS 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, with an additional $100 per credit added to the standard Mason graduate tuition. 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.

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 (12 credits):

- EOS 740 - Hyperspectral Imaging Systems Credits: 3
- EOS 753 - Observations of the Earth and Its Climate Credits: 3
- EOS 757 - Techniques and Algorithms in Earth Observing and Remote Sensing Credits: 3
- EOS 758 - Earth Image Processing Credits: 3

Elective Courses (3 credits):

Choose one of the following or another course approved by coordinator

- EOS 754 - Earth Science Data and Advanced Data Analysis Credits: 3
- EOS 756 - Physical Principles of Remote Sensing Credits: 3
- EOS 760 - Advanced Remote Sensing Applications Credits: 3
- EOS 840 - Hyperspectral Imaging Applications Credits: 3
- GEOG 562 - Photogrammetry Credits: 3
- GEOG 580 - Digital Remote Sensing 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 (ESGS) Program 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 geospatial 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.

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 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.

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.

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. 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.

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. 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.

**Computational-Quantitative Core (6 credits):**

Choose 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
- EOS 754 - Earth Science Data and Advanced Data Analysis Credits: 3
- EOS 791 - Advanced Spatial Statistics Credits: 3
- GEOG 585 - Quantitative Methods Credits: 3

**Geosciences-Geography Core (6 credits):**

Choose from the following:

- EOS 657 - The Lithosphere Credits: 3
- EOS 704 - Spatial Analysis and Modeling of Population Credits: 3
- EOS 721 - Biogeography Credits: 3

- CSI 655 - Atmospheric Physics I Credits: 3
  or
- EOS 670 - Introduction to Atmosphere & Weather Credits: 3

- EOS 656 - The Hydrosphere Credits: 3
  or
- EOS 725 - Advanced Hydrosphere Credits: 3
Geoinformation Sciences Core (6 credits):

Choose one course from the GIS group:

- GEOG 553 - Geographic Information Systems Credits: 3
- GEOG 563 - Advanced Geographic Information Systems Credits: 3
- GEOG 653 - Geographic Information Analysis Credits: 3
- EOS 771 - Algorithms and Modeling in GIS Credits: 3

and one course from the Remote Sensing group:

- GEOG 579 - Remote Sensing Credits: 3
- GEOG 580 - Digital Remote Sensing Credits: 3
- EOS 753 - Observations of the Earth and Its Climate Credits: 3
- EOS 756 - Physical Principles of Remote Sensing Credits: 3
- EOS 758 - Earth Image Processing 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 of the following areas (the curriculum plan must be approved by the program director):

Geosciences (GSC):

- EOS 656 - The Hydrosphere Credits: 3
- EOS 721 - Biogeography Credits: 3
- EOS 725 - Advanced Hydrosphere Credits: 3
- GEOG 670 - Applied Climatology Credits: 3
- CSI 655 - Atmospheric Physics I Credits: 3
- EVPP 550 - Waterscape Ecology and Management Credits: 3
- GEOL 601 - The Lithosphere Credits: 3

Geography (GEOG):

- GEOG 503 - Problems in Environmental Management Credits: 3
- GEOG 505 - Transportation Geography Credits: 3
- GEOG 531 - Land-Use Modeling Techniques and Applications Credits: 3
- GEOG 540 - Medical Geography Credits: 3
- GEOG 575 - Reconstructing Past Environments: Seminar in Geoarchaeology Credits: 3
- GEOG 585 - Quantitative Methods Credits: 3
- GEOG 674 - Environmental Impact Analysis Credits: 3
- GEOG 680 - Seminar in Thought and Methodology Credits: 3
- GEOG 785 - Geographic Field Work Credits: 3
- EOS 721 - Biogeography Credits: 3
- PUBP 810 - Regional Development and Transportation Policy Credits: 2-5
- PUBP 811 - Applied Methods in Regional Development and Transportation Policy Credits: 2-4
- EVPP 503 - Field Mapping Techniques Credits: 3
- EVPP 741 - Advanced Topics in Environmental Science and Public Policy Credits: 1-4

**Remote Sensing and Earth Observation (RS):**

- GEOG 562 - Photogrammetry Credits: 3
- GEOG 579 - Remote Sensing Credits: 3
- GEOG 656 - Terrain Mapping Credits: 3
- EOS 740 - Hyperspectral Imaging Systems Credits: 3
- EOS 753 - Observations of the Earth and Its Climate Credits: 3
- EOS 754 - Earth Science Data and Advanced Data Analysis Credits: 3
- EOS 756 - Physical Principles of Remote Sensing Credits: 3
- EOS 757 - Techniques and Algorithms in Earth Observing and Remote Sensing Credits: 3
- EOS 758 - Earth Image Processing Credits: 3

**Geographic Information Systems (GIS):**

- GEOG 553 - Geographic Information Systems Credits: 3
- GEOG 563 - Advanced Geographic Information Systems Credits: 3
- GEOG 590 - Selected Topics in Geography and Cartography Credits: 3
- GEOG 653 - Geographic Information Analysis Credits: 3
- GEOG 661 - Map Projections and Coordinate Systems Credits: 3
- GEOG 664 - Spatial Data Structures Credits: 3
- EOS 771 - Algorithms and Modeling in GIS Credits: 3
- EOS 772 - Distributed Geographic Information Systems Credits: 3
- EOS 773 - Interoperability of Geographic Information Systems Credits: 3

**Electives (21 credits):**

- 21 credits of approved electives

**Colloquium (3 credits):**

3 credits total, EOS 900 taken 3 times:

- EOS 900 - Research Colloquium in Earth Systems and Geoinformation Sciences Credits: 1
Dissertation Research (24 credits):

24 credits, with at least 12 credits in EOS 999:

- EOS 998 - Dissertation Proposal Credits: 1-12
- EOS 999 - Doctoral Dissertation Credits: 1-12

Total: 72 credits

Mathematical Sciences

Phone: 703-993-1460
Web: math.gmu.edu

Faculty

Professors: Alligood, Colonna, Fischer (chair), Kulesza, B. Lawrence, J. Lawrence, Levy, Morris, Polyak, Sachs, Saperstone, Sauer (COS Distinguished Scholar), Shapiro (undergraduate coordinator), Singman, Soltan, Walnut (graduate coordinator)

Associate professors: Agnarsson, Anderson, Gabel, Goldin, Kiley, Lamba, Lim, Lin, Sander, Seshaiyer, Wanner, Zoltek

Assistant professors: Emelianenko, Griva, Napoletani

Adjuncts: Crain, Gill, Lightbourne, Morse, Moumen, Nefessi, Roberts, Shaw, Wallace, Yazigi, Zampedro

Admin professional: O’Brien

Term instructors: Crossin, Goldman, Granfield, Matveev, Nuttall, O’Beirne

Affiliates: Loustaunau

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). 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) 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, 106, 108, 110, 111, 112, or 125.

Honors Program in Mathematics

Mathematics majors who have maintained a GPA of at least 3.5 in Mathematics courses and a GPA of 3.5 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 3.5 in mathematics courses and successfully complete MATH 405 and 406 with an average GPA of at least 3.5 in these two courses.

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.

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).

Students must complete 18 credits as follows: CTCH 602, 603, 604 or 605 (or equivalents with a specific disciplinary focus), 685, and 6 credits of CTCH electives, approved by the program director for higher education. 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 present the following:

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 - Vector Calculus 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 (12 credits):

- 12 credits of electives in MATH numbered above 300

Concentrations

Students may select an optional concentration in education.

▲ Concentration in Education (MTHE)

Students selecting the education concentration take the following 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 (AMT), applied mathematics (ACTM), or education (MTHE). 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 present the following. (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.)

Degree Requirements

• Program and concentration-specific 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 - Vector Calculus 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):

For all students, a one-year sequence of a laboratory science selected from one of the following:

Biology sequence:
• BIOL 213 - Cell Structure and Function Credits: 4
and
• BIOL 303 - Animal Biology Credits: 4
or
• BIOL 304 - Plant Biology Credits: 4

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 take  CS 112 - Introduction to Computer Programming Credits: 4
Students in the actuarial concentration also take:
• STAT 362 - Introduction to Computer Statistical Packages Credits: 3

Additional 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 credits of course work above MATH 300
Departmental Non-mathematical Requirements

- Students with no selected concentration or those with the applied mathematics concentration must select a second year of science from one of the following three options: a second sequence from the list above; 6 credits from more advanced courses in biology, chemistry, geology, or physics (but only courses acceptable for credit toward a natural science major); or the 4-credit option PHYS 262, 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 education (MTHE). 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, and 33 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

▲ Concentration in Actuarial Mathematics (ACTM)

- MATH 351 - Probability Credits: 3
- MATH 352 - Statistics Credits: 3
- MATH 441 - Deterministic Operations Research Credits: 3
- MATH 444 - Deterministic Operations Research Credits: 3
- 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
▲ Concentration in Education (MTHE)

- 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 321 - Abstract Algebra Credits: 3
- MATH 351 - Probability Credits: 3
- one 3-credit course above MATH 300

General Comments

For math majors:

MATH 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 105, 106, 108, 110, 111, 112, 113 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. If they do not complete the relevant program in the Learning Center or do not achieve the necessary score after retaking the test, they are dropped from the course. Depending on their test scores, students who do not place into MATH 113 will be advised to take MATH 105 or visit the Math Learning Center to prepare for MATH 105.
- MATH 105 does 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.
Undergraduate Minor

Mathematics for School of Management Students Minor

Banner Code: MSOM

Course Work

To receive this minor, students must complete 20 credits 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

Note:

Eight credits of course work must be unique to the minor. For policies governing all minors, see the Academic Policies chapter of this catalog.

Total: 20 credits

Mathematics Minor

Banner Code: MATH
To receive a minor in mathematics, students must complete 21 credits that include a total of 8 hours of math that are 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.

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 - Vector Calculus 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):

- One 3-credit math course that requires MATH 290 as a prerequisite

One general elective course (3 credits):

- One 3-credit math course at the 300 or 400 level, 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.

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.

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.

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.

Degree Requirements

Standard Program

In addition to fulfilling degree requirements for graduate study, students must complete 30 credits distributed as follows:

- MATH 621 - Algebra I Credits: 3
- MATH 675 - Linear Analysis I 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.

In addition to fulfilling degree requirements for graduate study, students must complete 30 credits distributed as follows:

- MATH 621 - Algebra I Credits: 3
- MATH 675 - Linear Analysis I Credits: 3
- MATH 677 - Ordinary Differential Equations Credits: 3
- or
- MATH 678 - Partial Differential Equations Credits: 3
- MATH 685 - Numerical Analysis 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 - 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 M (formerly Course 3), SOA Exam C (formerly Course 4), VEE for applied statistics (formerly part of Course 4), and Exam A-1 and EA-1A (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 achieved in 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.

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 653 - Actuarial Modeling III Credits: 3
- MATH 654 - Construction and Evaluation of Actuarial Models 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

Total: 18 credits

Notes:

The graduate certificate course work provides preparation for SOA and CAS 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 all of the SOA Exam FM material (as well as CAS Exam 2). MATH 555, 556, and 653 cover all of the Exam M material and much of the CAS Exam 3 as well as the EA1 exam. MATH 654 covers most of the SOA Exam C material (as well as CAS Exam 4). MATH 655 covers all of the EA2-A Exam material and some of the SOA Exam 8.

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 that degree according to the following rules:

- None of the actuarial mathematics courses MATH 551, 554, 555, 556, 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
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.

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.

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.

Preliminary Written and Qualifying Exams

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 the four required 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.

Students are required to take a qualifying exam after passing the preliminary written exam. This exam will have oral and written components. 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). The qualifying exam will cover the equivalent of approximately four courses of material from the major area and three courses from the minor area.

Dissertation and Committee

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.

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.
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. Students must complete the following curriculum requirements:

Core courses (12 credits):

- MATH 621 - Algebra I Credits: 3
- MATH 631 - Topology I: Topology of Metric Spaces Credits: 3
- MATH 675 - Linear Analysis I Credits: 3
- MATH 677 - Ordinary Differential Equations Credits: 3

Preliminary Written Exam

Students are required to take a preliminary written exam based on material in three core courses of their choice.

Qualifying Exam

Students take a qualifying exam after passing the preliminary exam. The qualifying exam will have oral and written components.

Seminar (6–9 credits):

- MATH 795 - Graduate Seminar Credits: 1

Dissertation proposal and research (12–24 credits):

- MATH 998 - PhD Thesis Proposal Credits: 1-12
- MATH 999 - PhD Thesis Credits Credits: 1-12

Note:

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. Portions of the preliminary written exam may be waived with approval of the graduate coordinator if the student enters the PhD program with a master’s degree in mathematics. 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.

Molecular and Microbiology
Faculty

Chair: Willett

Professors: Bailey (distinguished), Liotta, Petricoin, Popov, Soyfer (distinguished university), Willett

Associate professors: Baranova, Christensen, Fryxell, Grant, Royt

Assistant professors: Cox, van Hoek, Wu

Term assistant professors: Beck (associate chair), Coss, Fonduefe, Fox, Jarrar, Kocache, Madden, Otto, Pelayes

Adjunct faculty: Baker, McClintock, Pitt, Tondi

Emeritus: Isbister

Course Work

The department offers all course work designated BIOL, BIOS, and MTCH in the Courses chapter of this catalog.

Other Undergraduate Programs

The Molecular and Microbiology department works closely with and provides administrative input 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 bachelors degrees in Biology.

Policy on Using Departmental Laboratories

Only authorized experiments and exercises may be carried out in any departmental 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.

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.

**Master's Degree**

**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.

**Admission Requirements**

Applicants must have a bachelor’s degree in biology or its equivalent, except for students who choose the BCB concentration. 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 work 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. All MS concentrations require a GPA of 3.00 in biology course work or in the last 60 credits of undergraduate study is required. 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.

**Degree Requirements**

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 a member of the Molecular and Microbiology Department. 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.

Students have the option to complete a thesis (3 to 6 credits of BIOL 799) or a research project (1 to 3 credits of BIOL 798). According to Mason graduate policies, the same quality of work is expected of students regardless of their chosen option; that is, the MS thesis option or the MS project option. In general, the MS thesis is most appropriate for students planning or considering a research career. 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. The requirements differ primarily at the conclusion of the project, when students pursuing the project option must successfully complete written and oral comprehensive exams.
Students pursuing the thesis option must write a formal thesis that meets the requirements of the graduate school, as well as defending their thesis and presenting their results in a public seminar.

Students in the molecular biology, microbiology and infectious disease, and the bioinformatics and computational biology concentrations are required to present one research paper at the Departmental Journal Club meeting any time before graduation.

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 578 - Mutation, DNA Repair, and Environmental Contamination Credits: 3
- 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

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
    or
  • BIOS 702 - Research Methods Credits: 3

9 credits of core biology:
- BIOL 580 - Computer Applications for the Life Sciences Credits: 3
  or
- BINF 630 - Bioinformatics Methods Credits: 3
- BINF 634 - Bioinformatics Programming Credits: 3
- BIOS 741 - Genomics 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

6–15 credits of electives:

- 6–15 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:

- 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: 1
- BIOL 553 - Advanced Topics in Immunology Credits: 3
- BIOL 682 - Advanced Eukaryotic Cell Biology Credits: 3
- BIOL 720 - Microbial Metabolism Credits: 3
- BIOS 743 - Genomics, Proteomics, and Bioinformatics Credits: 3
- BIOS 710 - Current Topics in Bioscience Credits: 1-3

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
- BIOS 702 - Research Methods Credits: 3

9-10 credits of core biology:

- BIOL 574 - Population Genetics Credits: 3
- BIOL 579 - Molecular Evolution and Conservation Genetics Credits: 3
- BIOS 767 - Molecular Evolution Credits: 3
  plus 3–4 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
- BIOL 695 - Seminar in Molecular, Microbial, and Cellular Biology Credits: 1

1–6 credits of research:
either 1-3 credits of:

- BIOD 798 - Master's Research Project in Biodefense Credits: 3

or 3-6 credits of:

- BIOD 799 - Master's Thesis in Biodefense Credits: 1-6

5–14 credits of electives:

- 5–14 credits of electives in BIOL, BIOS, or related areas as approved by the student’s advisor and the program director

Total: 30 credits

Doctoral Degree

Biosciences, PhD

Banner Code: SC-PHD-BIOS

This program is a research-oriented field of study that prepares students for significant contributions in academic or industrial settings. The area of emphasis in functional genomics and biotechnology includes microarray analysis of gene expression, sequencing and analysis of genes, gene family evolution, mechanisms of toxicology and mutagenesis, and biotechnological applications. 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 comprehensive exam, and a successful dissertation proposal can the students advance to candidacy status. The third tier focuses on research and culminates in a dissertation.

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 and biology or biochemistry subject exams taken within the past five years prior to date of application submission.

An interview may 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.

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.

- Emphasis or concentration: 12–16 credits required courses (see below)
- Elective
- Two presentations at departmental Journal Club
- Qualifying exam

Core courses: 12 credits in

- BIOS 701 - Biochemical Systematics Credits: 3
- BIOS 702 - Research Methods Credits: 3
- BIOS 703 - Laboratory Rotation Credits: 1
- BIOS 704 - Topics in Biosciences Credits: 1

Dissertation: 12–24 credits in proposal and research

- BIOS 998 - Doctoral Dissertation Proposal Credits: 1-6
- BIOS 999 - Doctoral Dissertation Research Credits: 1-24

Notes:

On 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.

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. On 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 (999). Students must present their dissertation results to their graduate committee on a regular basis until graduation. For graduation, students will present their results to their graduate committee and defend their dissertation publicly.

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 the departmental Journal Club meeting any time before graduation.

**Emphasis in Functional Genomics and Biotechnology**

This emphasis prepares students for significant contributions in an academic or industrial research career. Areas of emphasis include 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.

**Requirements**

All students must take the following 15 graduate credits as their emphasis courses:

- 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

**Note:**

Electives may include graduate-level courses relevant to the student’s research and authorized by the student’s advisor and program director.

▲ **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.

**Requirements**

In addition to the degree requirements stated previously, students are required to take the following:

- BIOL 563 - Virology Credits: 3
- BIOL 669 - Pathogenic Microbiology Credits: 3
- BIOL 715 - Microbial Physiology Credits: 3
- BIOL 720 - Microbial Metabolism Credits: 3
- BIOL 718 - Techniques in Microbial Pathogenesis Credits: 3

**Electives to complete 72 credits**

To be chosen from:
• BIOL 533 - Selected Topics in Plant Biology Credits: 1-4
• BIOL 564 - Techniques in Virology Credits: 1
• BIOL 568 - Advanced Topics in Molecular Genetics Credits: 3
• BIOL 578 - Mutation, DNA Repair, and Environmental Contamination Credits: 3
• BIOL 579 - Molecular Evolution and Conservation Genetics Credits: 3
• BIOL 580 - Computer Applications for the Life Sciences Credits: 3
• BIOL 682 - Advanced Eukaryotic Cell Biology 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
• EVPP 551 - Fungi and Ecosystems Credits: 3
• BINF 633 - Molecular Biotechnology Credits: 3
• BINF 636 - Microarray Methodology and Analysis Credits: 3
• BINF 705 - Research Ethics Credits: 1

Neuroscience Program

Phone: 703-993-4333
Web: gmu.edu/departments/neuroscience

Faculty

Director: Jafri

Professors: Ascoli, Butler, Jafri, Olds, Smith, McCabe, Parasuraman

Associate professors: Blackwell, Cebral, Flinn, Fryxell, Greenwood, Houser, Kello, Klimov, Peterson, Sander, So

Assistant professors: Barreto, Cox, Dumas, Kabbani, Kalbfleisch, Kozhevnikov, 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, biochemistry, 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
• cellular organization and connections of sensory processing areas in fish
• 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 COS, CHSS, 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, biochemistry, 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 (including cognitive studies on great apes in collaboration with Great Ape Trust of Iowa).

Current research projects include the effects of drugs and alcohol on behavioral and neurological development, cellular organization and connections of sensory processing areas in fish, 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 applicants 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, two copies of official transcripts from each college and graduate institution attended, and a current résumé. 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.

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. 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.

Two areas of emphasis are included in the program: behavioral, anatomical, and molecular neuroscience; and theoretical, computational, and physiological neuroscience (TCP). All students will follow almost the same curriculum for the first two years, although emphasis prerequisites may vary slightly. For example, students in the TCP emphasis must have basic knowledge of integral calculus. It is expected that the selection of elective thesis topics will vary widely between the two areas of emphasis; however, students will be allowed to mix and match electives from both areas, with guidance and consent from the advisor or program director.

The courses, seminars, and laboratory rotations and readings (comprising a total of 48 credits) are organized as follows:

Core science:

- STAT 535 - Analysis of Experimental Data Using SPSS Credits: 3
- NEUR 604 - Ethics in Scientific Research Credits: 1-3
- NEUR 702 - Research Methods Credits: 3

Core neuroscience:

- NEUR 601 - Developmental Neuroscience Credits: 2
- NEUR 602 - Cellular Neuroscience Credits: 3
- NEUR 603 - Mammalian Neurobiology Credits: 3
- NEUR 701 - Neurophysiology Laboratory Credits: 2

9 credits of rotations and readings:

- NEUR 703

24 credits of dissertation research:

- NEUR 998 - Dissertation Proposal Credits: 1-12
- NEUR 999 - Doctoral Dissertation Credits: 1-12

Electives:
• 19 credits of electives

1 credit of seminar:

• NEUR 709 - Neuroscience@GMU Seminars Credits: 1

Note:

When course work is nearing completion, students should form a doctoral committee and prepare their thesis proposal. Candidacy exams include written and oral components. After passing the candidacy exam and receiving committee approval of the dissertation proposal, students are advanced to doctoral candidacy. The degree will be awarded after completion of the required course work and approval of a PhD thesis that makes an original and significant contribution to the field.

■ Physics and Astronomy

Phone: 703-993-1280
Web: www.physics.gmu.edu

Faculty

Professors: Becker*, Blaisten-Barojas*, Dworzecka, Ehrlich (chair), Ellsworth, Lieb, Mishin, Satija, Summers, Trefil

Associate professors: Barreto, Ceperley, Opher, Rubin, Satyapal, Sauer, So, Wallin*, Weingartner

Assistant professors: Cressman, Rosenberg, Tian, Weigel*, Zhang*

Term associate professor: Goldman, Oerter

Term assistant professors: Geller, Iacoletti, Jazaeri, Wyczalkowski

Term instructors: Ericson, Ewell

Emeriti: Ceperley, Evans, Mielczarek

Research faculty: Duxbury, Gliozzi, Meier, Poland, Richards

*These guest faculty hold primary appointments in other departments.

Course Work

The Physics and Astronomy Department offers all course work designated ASTR and PHYS in the Courses chapter of this catalog.

Honors Program in Physics

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 departmental 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.
Honors Program in Astronomy

Astronomy majors who have completed the prerequisites for ASTR 405 Honors Thesis in Astronomy, have a GPA of at least 3.5 in ASTR and PHYS courses taken at GMU, and have a GPA of at least 3.5 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 3.5 in their ASTR/PHYS courses. Students accepted into the honors program must complete ASTR 405 and 406 with a GPA of at least 3.5 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.

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 Physics and Astronomy Department. Those students are required to take at least 4 additional credits in approved physics courses.

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.

Research Opportunities

The department offers many opportunities for undergraduate students to get involved with research. Students should consult with faculty working on research of interest to them, based on their examination of the Physics Department web site.

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, 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.

Undergraduate Degree
Astronomy, BA

Banner Code: SC-BA-ASTR

The BA in astronomy prepares students for a career in industry, business, science education, and science writing, where analytical skills and scientific background are necessary. This degree is not suitable for students who intend to pursue a graduate degree in astronomy.

Students in the fields of mathematics, science, computer science, and engineering who are considering a double major should discuss this option with the undergraduate coordinator. Some course substitutions are allowed for such majors, but they must be approved in writing in advance.

Students must fulfill all requirements for bachelor’s degrees, including university general education requirements. Students majoring in astronomy must complete additional college requirements for the BA degree in COS. Also required are a minimum of 26 credits in physics and astronomy and 6 credits in mathematics, with a minimum GPA of 2.00. Through the course work below, astronomy majors satisfy university wide requirements in natural science and quantitative reasoning. ASTR 402 also satisfies the university’s writing-intensive requirement.

Degree Requirements

Note: Students who take the 11-credit physics sequence and one of the 8-credit math sequences can count the additional 7 credits beyond required minimum credits toward elective credit in the major.

Core Astronomy Courses (20 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
- ASTR 301 - Astrobiology Credits: 3
- ASTR 302 - Foundations of Cosmological Thought Credits: 3
- ASTR 402 - Methods of Observational Astronomy Credits: 3
- ASTR 490 - Astronomy Capstone Credits: 3

Physics Sequence (6 or 11 credits):

students take either this sequence:
- PHYS 243 - College Physics Credits: 3
- 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

Mathematics Sequence (6 or 8 credits):

• MATH 106 - Quantitative Reasoning Credits: 3
• MATH 108 - Introductory Calculus with Business Applications Credits: 3
  or
• MATH 113 - Analytic Geometry and Calculus I Credits: 4
• MATH 114 - Analytic Geometry and Calculus II Credits: 4
  or
• MATH 115 - Analytic Geometry and Calculus I (Honors) Credits: 4
• MATH 116 - Analytic Geometry and Calculus II (Honors) Credits: 4

Electives (15 credits):

At least 3 credits must be taken at or above 300-level

• ASTR 390 - Topics in Astronomy Credits: 1-4
• ASTR 403 - Planetary Sciences Credits: 3
• ASTR 408 - Senior Research Credits: 3
• 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
• BIOL 103 - Introductory Biology I Credits: 4
• BIOL 104 - Introductory Biology II Credits: 4
• BIOL 213 - Cell Structure and Function Credits: 4
• CHEM 101 - Introduction to Modern Chemistry Credits: 3
• CHEM 102 - Introduction to Organic, Biochemical, Pharmacological, and Fuel Chemistry Credits: 3
• 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 201 - Introductory Chemistry I Credits: 3
• CHEM 202 - Introductory Chemistry II Credits: 3
• CHEM 211 - General Chemistry Credits: 4
• GEOL 101 - Introductory Geology I Credits: 4
• GEOL 102 - Introductory Geology II Credits: 4
  or additional courses with permission of the department and course instructor

Astronomy, BS
The BS in astronomy prepares students for graduate school or one of the many careers 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 in the fields of mathematics, science, computer science, and engineering 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 in writing in advance.

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 17 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, they satisfy the university’s writing-intensive requirement.

Degree Requirements

Seven required core astronomy courses (21 credits):

- ASTR 103 - Astronomy Credits: 3
  or
- ASTR 113 - Introductory Astronomy: Stars, Galaxies, and the Universe Credits: 3
- ASTR 328 - Introduction to Astrophysics Credits: 3
- ASTR 402 - Methods of Observational Astronomy Credits: 3
- ASTR 403 - Planetary Sciences Credits: 3
- ASTR 404 - Galactic Astronomy Credits: 3
- ASTR 428 - Relativity and Cosmology Credits: 3
- ASTR 490 - Astronomy Capstone Credits: 3

Eight required physics courses (18 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 305 - Electromagnetic Theory Credits: 3
- PHYS 308 - Modern Physics with Applications Credits: 3

Five required math courses (17 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
• MATH 313 - Introduction to Applied Mathematics Credits: 3
  or
• MATH 314 - Introduction to Applied Mathematics Credits: 3

9 credits from the following:

(at least 6 credits must be in upper-level courses)

• any preapproved BIOL, CHEM, MATH, or PHYS courses
• ASTR 302 - Foundations of Cosmological Thought Credits: 3
• ASTR 401 - Computer Simulation in Astronomy Credits: 3
• ASTR 408 - Senior Research Credits: 3
• ASTR 409 - Astronomy Internship Credits: 3
• ASTR 530 - Astrophysics Credits: 3
• ASTR 535 - Space Instrumentation and Exploration Credits: 3
• CS 112 - Introduction to Computer Programming Credits: 4
• MATH 203 - Linear Algebra Credits: 3
• MATH 446 - Numerical Analysis I Credits: 3
• MATH 447 - Numerical Analysis II Credits: 3
• 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
• PHYS 251 - Introduction to Computer Techniques in Physics Credits: 3
• PHYS 303 - Classical Mechanics Credits: 3
• PHYS 307 - Thermal Physics Credits: 3
• PHYS 510 - Computational Physics I Credits: 3
• PHYS 575 - Atmospheric Physics I Credits: 3

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 9 credits in the last category above.

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

Emphasis in Graduate School Preparation

This emphasis prepares students for graduate study in observational or theoretical astronomy. Student must take two courses from the following. They should complete a senior project or internship in the specialty that they intend to pursue in graduate school.

• ASTR 530 - Astrophysics Credits: 3  
or  
• ASTR 535 - Space Instrumentation and Exploration Credits: 3
• MATH 446 - Numerical Analysis I 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
• ENGL 101 - Composition Credits: 3
• ASTR 103 - Astronomy Credits: 3
• 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

Third Semester

• ASTR 302 - Foundations of Cosmological Thought 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

• ASTR 301 - Astrobiology Credits: 3
• 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 - Introduction to Astrophysics Credits: 3
• PHYS 305 - Electromagnetic Theory Credits: 3
• ENGL 302 - Advanced Composition Credits: 3

Sixth Semester

• MATH 313 - Introduction to Applied Mathematics Credits: 3
• PHYS 307 - Thermal Physics Credits: 3
• PHYS 308 - Modern Physics with Applications Credits: 3

Seventh Semester

• MATH 446 - Numerical Analysis I Credits: 3
• ASTR 401 - Computer Simulation in Astronomy Credits: 3
• ASTR 403 - Planetary Sciences Credits: 3
• ASTR 490 - Astronomy Capstone Credits: 3
Eighth Semester

- MATH 447 - Numerical Analysis II Credits: 3
- ASTR 404 - Galactic Astronomy Credits: 3
- ASTR 408 - Senior Research Credits: 3
- ASTR 428 - Relativity and Cosmology Credits: 3

Physics, BS

Banner Code: SC-BS-PHYS

The BS in physics prepares students for graduate school and careers in 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.

Degree Requirements

Eleven required core physics courses (27 credits):

(Students double majoring in engineering and physics may substitute ECE 305 for PHYS 305.)

- 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

Six credits from:

- 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 - Honors Thesis in Physics Credits: 3
  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 - Introduction to Astrophysics Credits: 3
  or
- ASTR 428 - Relativity and Cosmology Credits: 3

12 credits from:

- 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
  or any approved upper-level physics, astronomy, chemistry, electrical engineering, or mathematics courses

Six required math and statistics courses (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
  or
- MATH 313 - Introduction to Applied Mathematics Credits: 3
  or
- MATH 413 - Modern Applied Mathematics I Credits: 3
  or
- STAT 344 - Probability and Statistics for Engineers and Scientists I Credits: 3

Areas of Emphasis

In meeting the requirement for 6 credits outside the core, students have the option of electing an emphasis. The courses required for each emphasis are listed below. Students who wish to complete an emphasis should plan a program of study in consultation with their advisor.
Emphasis in Applied Solid State Physics

This emphasis is for students who wish to pursue a career in the semiconductor industry. To complete this emphasis, students should take 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

In addition, students should complete a senior project or honors thesis in applied solid state physics:

- PHYS 408 - Senior Research Credits: 2-3
  or
- PHYS 409 - Physics Internship Credits: 3
- PHYS 405 - Honors Thesis in Physics Credits: 3
  or
- PHYS 406 - Honors Thesis in Physics Credits: 3

Emphasis in Astrophysics

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 select four courses from the following:

- PHYS 428 - Relativity and Cosmology Credits: 3
- ASTR 328 - Introduction to Astrophysics Credits: 3
- ASTR 404 - Galactic Astronomy Credits: 3
- ASTR 530 - Astrophysics Credits: 3
- ASTR 535 - Space Instrumentation and Exploration Credits: 3
- MATH 446 - Numerical Analysis I Credits: 3

In addition, students should complete a senior project or honors thesis on an astrophysics problem:

- PHYS 408 - Senior Research Credits: 2-3
  or
- PHYS 405 - Honors Thesis in Physics Credits: 3
- PHYS 406 - Honors Thesis in Physics Credits: 3

Emphasis in Computational Physics

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 at least 9 credits 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

In addition, they complete a senior project or honors thesis on a problem that involves using a computer for the solution of a physical problem:

• PHYS 408 - Senior Research Credits: 2-3
  or
• PHYS 405 - Honors Thesis in Physics Credits: 3
• PHYS 406 - Honors Thesis in Physics Credits: 3

Emphasis in Electronics

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 at least 9 credits 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

In addition, they should complete a senior project or honors thesis on an electronics problem:

• PHYS 408 - Senior Research Credits: 2-3
  or
• PHYS 405 - Honors Thesis in Physics Credits: 3
• PHYS 406 - Honors Thesis in Physics Credits: 3

Emphasis on Graduate School Preparation

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 at least 9 credits 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
• ASTR 530 - Astrophysics Credits: 3
In addition, a senior project or honors thesis in the specialty that they intend to pursue in graduate school:

- PHYS 408 - Senior Research Credits: 2-3
- PHYS 405 - Honors Thesis in Physics Credits: 3
- PHYS 406 - Honors Thesis in Physics Credits: 3

Emphasis in Medical Physics

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

Emphasis in Physics Education

This emphasis is intended for students wishing to pursue a career teaching high 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. 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 - Topics in Physics Credits: 1-4

The students must also take the following education courses to qualify for the teaching license:

- 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
- 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
- ENGL 101 - Composition Credits: 3
- CHEM 211 - General Chemistry Credits: 4
  or
- BIOL 213 - Cell Structure and Function 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 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
• ENGL 302 - Advanced Composition Credits: 3

Sixth Semester

• PHYS 306 - Wave Motion and Electromagnetic Radiation Credits: 3
• PHYS 307 - Thermal Physics Credits: 3
• PHYS 308 - Modern Physics with Applications Credits: 3
• MATH 314 - Introduction to Applied Mathematics 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 416 - Special Topics in Modern Physics Credits: 1
• PHYS 410 - Computational Physics I Credits: 3

Eighth Semester

• PHYS 408 - Senior Research Credits: 2-3
• PHYS 412 - Solid State Physics and Applications Credits: 3
• PHYS 440 - Nuclear and Particle Physics Credits: 3

Undergraduate Interdisciplinary Minor

Renewable Energy Interdisciplinary Minor

Banner Code: RNRG

This college-wide interdisciplinary minor administered by the Physics and Astronomy Department 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.

Course Work
Core Courses (10 credits):

- PHYS 331 - Physics 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.

Course Work
Physics Prerequisite

Students take either this 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

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 - Introduction to Astrophysics Credits: 3
- ASTR 402 - Methods of Observational Astronomy Credits: 3
- ASTR 403 - Planetary Sciences Credits: 3
- ASTR 404 - Galactic Astronomy Credits: 3
- ASTR 428 - Relativity and Cosmology Credits: 3
- ASTR 530 - Astrophysics Credits: 3
- PHYS 122 - Inside Relativity Credits: 1
- PHYS 123 - Inside the Quantum World Credits: 1

Total: 15 credits
Physics Minor

Banner Code: PHYS

Course Work

The minor requires 18 credits with a minimum GPA of 2.00, including:

- 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
- PHYS 306 - Wave Motion and Electromagnetic Radiation Credits: 3
- PHYS 307 - Thermal Physics Credits: 3
- PHYS 308 - Modern Physics with Applications Credits: 3
- PHYS 402 - Introduction to Quantum Mechanics and Atomic Physics Credits: 3
- PHYS 428 - Relativity and Cosmology Credits: 3

- PHYS 305 - Electromagnetic Theory Credits: 3
  or
- PHYS 513 - Applied Electromagnetic Theory Credits: 3

Note:

Eight credits of course work must be unique to the minor. For policies governing all minors, see the Academic Policies chapter of this catalog.

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. See the department for further details.

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 emphases. 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.

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. Those with less recent bachelor’s degrees may present a statement of their work experience in lieu of the GRE.

Degree Requirements

Candidates for the degree must successfully complete 30 credits in the categories shown below:

I. 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)

II. 15 credits in one of three emphases (A, B or C):

A. Standard emphasis:

Students should take any five of the following courses:

- 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 612 - Physics of Modern Imaging Credits: 3
- PHYS 613 - Computational Physics II Credits: 3
- PHYS 620 - Continuum Mechanics Credits: 3
- PHYS 676 - Atmospheric Physics Credits: 3
- PHYS 701 - Theoretical Physics Credits: 3
- PHYS 705 - Classical Mechanics Credits: 3
- PHYS 711 - Statistical Mechanics Credits: 3
- PHYS 785 - Classical Electrodynamics II Credits: 3
- PHYS 784 - Quantum Mechanics II Credits: 3
- ASTR 530 - Astrophysics Credits: 3
- ASTR 765 - High-Energy and Accretion Astrophysics Credits: 3
- ASTR 766 - Relativity and Cosmology Credits: 3

Total: 15 credits

B. 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

C. 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
- ASTR 760 - Space Plasma Physics Credits: 3
- BINF 731 - Protein Structure Analysis Credits: 3
- BINF 740 - Introduction to Biophysics 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 660 - Space Instrumentation and Exploration Credits: 3
- CSI 721 - Computational Fluid Dynamics I Credits: 3
- CSI 722 - Computational Fluid Dynamics II Credits: 3
- CSI 744 - Linear and Nonlinear Modeling in the Natural Sciences Credits: 3
- CSI 763 - Statistical Methods in Space Sciences 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: 3
- NANO 500 - Introduction to Nanomaterials and Interactions Credits: 3
- NANO 510 - Strategies for Nanocharacterization Credits: 3
- PHYS 512 - Solid State Physics and Applications Credits: 3
- PHYS 513 - Applied Electromagnetic Theory Credits: 3
- PHYS 540 - Nuclear and Particle Physics Credits: 3
- PHYS 575 - Atmospheric Physics I 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 660 - Space Weather Credits: 3
• PHYS 676 - Atmospheric Physics Credits: 3
• PHYS 760 - Space Plasma Physics Credits: 3

Total: 15 credits

III. 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 (PHYS 798) or thesis (PHYS 799).

• ECE 798 - Research Project Credits: 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 Department of Computational and Data 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 530 - Astrophysics Credits: 3
- ASTR 680 - Physics of Interstellar Media Credits: 3
- ASTR 760 - Space Plasma Physics 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
- CSI 721 - Computational Fluid Dynamics I 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 780 - Advanced Selected Topics in Physics 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: 3

**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:

- PHYS 784 - Quantum Mechanics II Credits: 3
- PHYS 785 - Classical Electrodynamics II Credits: 3
- PHYS 701 - Theoretical Physics Credits: 3
- PHYS 705 - Classical Mechanics Credits: 3
- PHYS 711 - Statistical Mechanics Credits: 3

Doctoral Degree

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 candidacy.

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.

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 (PHYS/ASTR 998) and doctoral dissertation research
(PHYS/ASTR 999) credits. For students entering the doctoral program with previous graduate work, the 48 credits of course work may be reduced by a maximum of 30 credits. The required 48 credits of course work are divided among core courses, physics and astronomy elective courses, general elective courses, and a seminar requirement. The 12 credits of core courses include PHYS 684, 685, 705, and 711. Note that doctoral candidacy (qualifying) examinations will be given on the topics covered in these core courses. The remaining 36 credits includes 3 credits of PHYS 703, a 1-credit seminar that is repeated three times, 6 credits of physics or astronomy specialty courses, and 27 credits of general electives, which may be chosen from physics and astronomy, or other related disciplines. These elective courses may include research credits (PHYS/ASTR 796, PHYS/ASTR 798) in preparation for the Doctoral Dissertation. These research courses may be repeated with the approval of the student’s advisor or Dissertation Committee in order to be applied toward the degree requirements.

- ASTR 796 - Directed Reading and Research Credits: 1-6
- ASTR 798 - Research Project Credits: 3
- ASTR 998 - Doctoral Dissertation Proposal Credits: 1-12
- ASTR 999 - Doctoral Dissertation Credits: 1-12
- PHYS 684 - Quantum Mechanics I Credits: 3
- PHYS 685 - Classical Electrodynamics I Credits: 3
- PHYS 703 - Seminar in Physics Credits: 1
- PHYS 705 - Classical Mechanics Credits: 3
- PHYS 711 - Statistical Mechanics Credits: 3
- PHYS 796 - Directed Reading and Research Credits: 1-6
- PHYS 798 - Research Project Credits: 3
- PHYS 998 - Doctoral Dissertation Proposal Credits: 1-12
- PHYS 999 - Doctoral Dissertation Credits: 1-12

Qualifying examinations

All students must successfully pass the qualifying examinations for the four core courses. The qualifying exam 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). 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. There is a written and an oral component for each section of the qualifying exam. A student must satisfactorily pass both components of the exam. The oral component may be waived by unanimous consent of the Qualifying Examination Committee for 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.

Advancement to candidacy

After the successful completion of the qualifying examination, a Dissertation Committee should be formed as soon as possible. This committee consists of a graduate faculty member (see the Graduate Faculty section in the catalog) 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 student’s department or degree program. The composition of the committee must be approved by the program director. Qualified individuals who are not members of the graduate faculty (i.e., faculty at another university) may serve on a dissertation committee with the approval of the program director and the associate dean for graduate programs. The Dissertation Committee is responsible for directing students in their chosen field of research. The Dissertation Committee should work with the student to select specialty courses and electives to form a cohesive program of study. Preliminary research credits (PHYS/ASTR 796 and PHYS/ASTR 798) can be taken as a part of the electives to prepare for the student’s dissertation. Advancement to candidacy
implies that a doctoral student has demonstrated both breadth and depth of knowledge in the field of study and is capable of conducting research on the boundaries of knowledge. Before doctoral students may be advanced to candidacy by the dean, they will need to have had completed all required course work, passed the qualifying examinations, and been recommended by the Dissertation Committee. A doctoral student has six years from the time of first enrollment as a degree-seeking student to advance to candidacy.

- ASTR 796 - Directed Reading and Research Credits: 1-6
- ASTR 798 - Research Project Credits: 3
- PHYS 796 - Directed Reading and Research Credits: 1-6
- PHYS 798 - Research Project Credits: 3

**Doctoral dissertation**

After advancing to candidacy, doctoral candidates will work with the Dissertation Committee to formalize 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 refereed scientific journals. A total of 24 credits in the following two courses must be taken: PHYS 998 or ASTR 998 Dissertation Proposal (0 to 12 credit hours), and PHYS 999 or ASTR 999 Doctoral Dissertation (12 to 24 credit hours). Note that before the student may enroll in PHYS/ASTR 999, the dissertation proposal must be approved by the Dissertation Committee and evidence of its approval sent to the dean for approval. Before that time, the student may enroll in PHYS/ASTR 998 (Dissertation Proposal). Students working on their Doctoral Dissertation (999) must register for a minimum of 3 credits of 999 per semester (excluding summers) until they have completed the 12-credit minimum requirement for 999, after which they must register for 1 credit of 999 until the dissertation is completed and accepted. The dissertation must be defended in a public forum before the Dissertation Committee and other interested faculty. After the candidate successfully defends the dissertation, the Dissertation Committee recommends to the Graduate Faculty of George Mason University the awarding to the candidate the degree of doctor of philosophy in physics. Students have five years from the time of advancement to candidacy to graduate.

- 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
College of Visual and Performing Arts

College of Visual and Performing Arts

Performing Arts Building, Room A407
Phone: 703-993-4551
Web: gmu.edu/cvpa
College Code: AR

Departments

Art and Visual Technology
Dance
Music
Theater

Additional Academic Units

Art Education
Arts Management
Computer Game Design
Film and Video Studies

“Mason is deeply committed to the arts and educating our students about the significance the arts have in all our lives. This is why the arts are integral to our institution. We encourage active student participation in the many programs and related courses in the arts that are scheduled throughout the year. Students are able to receive a more balanced education, develop a deeper appreciation of the arts, and achieve a more enlightened perspective of the world.”

—Alan G. Merten
President, George Mason University

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, which comprises 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, 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, TheaterSpace, the Fine Arts 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  
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  
Jean Kellogg, Executive Director, Hylton Performing Arts Center  
Victoria N. Salmon, Assistant Dean, Graduate Studies  
Scott Martin, Assistant Dean, Research, Technology  
Rick Davis, Artistic Director, Center for the Arts and Co-Artistic Director, Theater of the First Amendment

**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.” All entering students who have not yet satisfied the university-wide requirement in quantitative reasoning are required to take the math placement test prior to enrollment.

**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**

Students are ultimately responsible for their academic progress towards their degrees. 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 should contact the CVPA Academic Affairs Office (Performing Arts Building, A407; 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.

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 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 nonactivity PHED courses for elective credit for CVPA degrees.

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.

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.
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 University Registrar's Office 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 Associate Dean for Academic Affairs reviews all undergraduate appeals, and the Assistant Dean for Graduate Programs reviews all graduate appeals.

The Decision of the CVPA Associate Dean (undergraduate students), or Assistant Dean (graduate students) 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 Associate Dean for Academic Affairs reviews all undergraduate appeals, and the Assistant 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 Associate Dean for Academic Affairs reviews all non-academic appeals and grievances.

Academic Dismissal from a Graduate Program:

The Registrar's Office 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.
4. The CVPA Assistant Dean for Graduate Programs reviews the appeal.
5. The final decision of the CVPA Assistant Dean is forwarded to the student and Registrar's Office.
6. 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.

**Undergraduate Interdisciplinary Minor**

**Arts Administration Minor**

**Banner Code: ARTA**

Performing Arts Building  
Room A407  
Phone: 703-993-1321

**Faculty**

Miller, 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.

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 administration consists of 18 credits, including:

- CVPA 305 - Seminar in Arts Management Credits: 3
- CVPA 489 - Field Experience in the Arts Credits: 3-6

**Note:**

All other credits are selected in consultation with a program advisor from relevant courses in CVPA, the Nonprofit Management Program in the Department of Public and International Affairs, the School of Management, the Department of Communication, or other appropriate areas of study. The minor 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. See the program coordinator for more information.

**Art and Visual Technology**

College Hall, Room C200  
Phone: 703-993-8898  
Web: www.avt.gmu.edu

**Faculty**

Harold Linton, Chair
Professors: Carbonneau, Frederick, Kravitz (gallery director), Linton (chair), Mandes, Sandell

Associate professors: Ashcraft (associate chair), Crawford, Feerick, Frenn, White

Assistant professors: Cooley, Cui, Endress, Karanetou, Rothstein, Sheridan, Winant (associate chair), Wrbican

Term assistant professors: Constantine, Del Popolo, Malone, Stanley, Starr

Adjunct faculty: Bradley, Bulisova, Carr-Shaffer, Castellana, Chao, Clements, Cushner, DeLuca, Dicicco, Fairfax, Ferreira, Goldman, Gorman, Guerrieri, Herce, Hicks, Ho, Hoffmann, Kerns, Kirk, Nahidian, Organ, Petzwinkler, Rodriguez, Rozario, Sapsford, Serafin, Tomhave, Watson, Wiseman

Mission

The Department of Art and Visual Technology (AVT) 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 AVT 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 Department of Art and Visual Technology offers all course work designated AVT in the Courses chapter of this catalog.

UNDERGRADUATE PROGRAMS

Undergraduate studio degrees offered by the Department of Art and Visual Technology include the bachelor of arts (BA) and the bachelor of fine arts (BFA). The department also offers an undergraduate minor in AVT, an interdisciplinary minor in multimedia, and a departmental 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 department’s art education advisor to learn more about teacher preparation.

All George Mason University students are welcome to enroll in course work in AVT. Consult the course listings for prerequisites.

Admission to AVT Requirements

All students are admitted to AVT programs of study separately from their admission to the university and only by portfolio review. Students may be admitted to study in the BA or BFA program by one of three ways:

- Presenting a portfolio and any other requested credentials at designated portfolio review days before each semester and before applying for admission
Completing the sequence of AVT 104, 105, and 222 with a 3.25 or higher average in those courses, and applying for admission through a portfolio review

Completing the sequence of AVT 104, 105, and 222; and 323 or 324; and one other 200-level AVT course with a 3.00 or higher GPA in those courses; and applying for admission through a portfolio review

**BFA Portfolio Review**

New students at Mason may apply to the BFA program upon admission to the university through a portfolio review. Portfolio reviews are scheduled through periodic Admission Office events, or through scheduled dates designated by the AVT Department. Please call the main office to schedule an appointment (703-993-8898).

For current Mason student in the AVT BA program who wish to change to the BFA program, or other current Mason students, application deadlines are at the end of the sixth week of the fall and spring semester each year. Students planning to apply must meet with the coordinator of their AVT concentration in the semester prior to their application to discuss the portfolio.

For all candidates, admission to the BFA program is highly competitive and requires submission of the following:

For all incoming students:

- Portfolio of 10 to 15 original examples of college-level art work
- One-page, double-spaced essay

In addition, for all transfer students:

- Transcripts of all college-level study
- Must have at least a 3.00 cumulative GPA overall and in the major

Student may alternatively be admitted to study in the BFA program by one of three ways:

- Presenting a portfolio and any other requested credentials at designated portfolio review days before each semester and before applying for admission
- Completing the sequence of AVT 104, 105, and 222 with a 3.25 or higher average in those courses, and applying for admission through a portfolio review
- Completing the sequence of AVT 104, 105, and 222; and 323 or 324; and one other 200-level AVT course with a 3.00 or higher GPA in those courses; and applying for admission through a portfolio review

Students interested in applying should contact the Department of Art and Visual Technology for an application and specific directions on presenting the portfolio.

**Artsbus Requirement**

All AVT majors must meet the department’s requirement of travel to galleries and museums through the AVT Artsbus program. Students meet this requirement by enrolling in AVT 300 Artsbus Attendance. The procedure and requirements for enrollment in AVT 300 is the same as for any other class.

Freshmen who enroll as AVT majors must take AVT 300 for five semesters. 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.
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 “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 AVT undergraduate students must earn a minimum 2.00 cumulative GPA in their major.

Studios

The Art and Visual Technology program is located in the arts 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.

Studios are open to students for extended periods mornings, evenings, and weekends whenever classes are not in progress. Policies, procedures, and schedules for studio use are established by the AVT studio faculty and are posted in the studios.

AVT Honors Program

Students interested in the Honors Program in Art and Visual Technology should contact the chair of the department. 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.

Academic Policies

Please see College of Visual and Performing Arts academic policies.

Undergraduate Degree

Art and Visual Technology, BA
Faculty

Harold Linton, Chair

Professors: Carbonneau, Frederick, Kravitz (gallery director), Linton (chair), Mandes, Sandell

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UNDERGRADUATE PROGRAM

BA-AVT

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Academic Policies

Please see College of Visual and Performing Arts academic policies.

Degree Requirements

General Education (37 credits)

Foundation Requirements

- Witten Communication:
- ENGL 101 - Composition Credits: 3
- ENGL 302 - Advanced Composition Credits: 3 (Nonnative speakers of English with limited proficiency in the language may substitute ENGL 100 for ENGL 101. Students must attain a minimum grade of C in ENGL 100 or 101, as well as in 302, to fulfill degree requirements.)
- Oral communication (3)
- Quantitative reasoning (3)
- Information technology (3)

Core Requirements

- Literature (3)
- Arts* (3)
- Natural science (including at least one laboratory science) (7)
• Western civilization (3)
• Global understanding** (3)
• Social and behavioral sciences (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
  and
• ARTH 201 - Survey of Western Art Credits: 3
• ARTH 374 - Art Now Credits: 3
• AVT 301 - Visual Voices Colloquium Credits: 1
• AVT 307 - Aesthetics Credits: 3
• AVT 395 - Writing for Artists Credits: 3

Note

AVT 301 must be taken for a total of 3 credits or each semester enrolled, if less than three semesters.

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 232 - Painting I Credits: 4
- AVT 243 - Printmaking I Credits: 4
- AVT 252 - Photography I 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 Digital Arts Credits: 4
- AVT 396 - Introduction to Art Teaching and Learning Credits: 3
- AVT 399 - Special Topics in Art and Visual Technology Credits: 1-6

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 and Vision 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 - Digital Art and Animation Credits: 4
• AVT 383 - Three-Dimensional Digital Art Credits: 4
• AVT 390 - Digital Media and Video Art Credits: 4
• AVT 482 - Advanced Two-Dimensional Digital Art Credits: 4
• AVT 483 - Internet Art Credits: 4
• AVT 487 - Advanced Digital Media 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 - Photography II Credits: 4
• AVT 459 - About Photography: Practice and Research Credits: 4
4 credits from:

- AVT 452 - Advanced Photographic Printing I Credits: 4
- AVT 453 - Advanced Photographic Printing II Credits: 4
- AVT 454 - Alternative Photo Processes Credits: 4
- AVT 455 - Advanced Digital Photo Credits: 4
- AVT 456 - Large Format Photography Credits: 4
- AVT 457 - Documentary Photography Credits: 4
- AVT 458 - Advanced Studio Lighting Credits: 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

8 credits from:

- AVT 345 - Artists' Books as Visual 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 399 or AVT 491 may be taken with permission of respective Area Coordinator.

- AVT 399 - Special Topics in Art and Visual Technology Credits: 1-6
- AVT 491 - Independent Study in Art and Visual Technology Credits: 1-6

General Electives (20-23 credits)

BA students must use general electives to either complete a minor program outside the 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*

College Hall, Room C200  
Phone: 703-993-8898  
Web: www.avt.gmu.edu

**Faculty**

Harold Linton, Chair  

**Professors:** Carbonneau, Frederick, Kravitz (gallery director), Linton (chair), Mandes, Sandell  

**Associate professors:** Ashcraft (associate chair), Crawford, Feerick, Frenn, White  

**Assistant professors:** Cooley, Cui, Endress, Karametou, Rothstein, Sheridan, Winant (associate chair), Wrbican  

**Term assistant professors:** Constantine, Del Popolo, Malone, Stanley, Starr  

**Adjunct faculty:** Bradley, Bulissova, Carr-Shaffer, Castellana, Chao, Clements, Cushner, DeLuca, Dicicco, Fairfax, Ferreira, Goldman, Gorman, Guerrieri, Herce, Hicks, Ho, Hoffmann, Kerns, Kirk, Nahidian, Organ, Petzwinkler, Rodriguez, Rozario, Sapsford, Serafin, Tomhave, Watson, Wiseman

**Mission**

The Department of Art and Visual Technology (AVT) 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 AVT 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 Department of Art and Visual Technology offers all course work designated AVT in the Courses chapter of this catalog.

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.

Admission to AVT Requirements

All students are admitted to AVT programs of study separately from their admission to the university and only by portfolio review.

New students at Mason may apply to the BFA program upon admission to the university through a portfolio review. Portfolio reviews are scheduled through periodic Admission Office events, or through scheduled dates designated by the AVT Department. Please call the main office to schedule an appointment (703-993-8898).

Current Mason students in the AVT BA program who wish to change their degree program to a BFA, or other current Mason students, may apply for admission to the BFA degree program by presenting a substantive college level portfolio and other requested credentials during the department's designated application period at the end of the sixth week of the fall and spring semester each year. Students planning to apply must meet with the coordinator of their AVT concentration in the semester prior to their application to discuss the portfolio.

For all candidates, admission to the BFA program is highly competitive and requires submission of the following:

For all incoming students:

- Portfolio of 10 to 15 original examples of college-level art work
- One-page, double-spaced essay

In addition, for all transfer students:

- Transcripts of all college-level study
- Must have at least a 3.00 cumulative GPA overall and in the major

Students may alternatively be admitted to study in the BFA program by one of three ways:

- Presenting a portfolio and any other requested credentials at designated portfolio review days before each semester and before applying for admission
- Completing the sequence of AVT 104, 105, and 222 with a 3.25 or higher average in those courses, and applying for admission through a portfolio review
- Completing the sequence of AVT 104, 105, and 222; and 323 or 324; and one other 200-level AVT course with a 3.00 or higher GPA in those courses; and applying for admission through a portfolio review

Students interested in applying should contact the Department of Art and Visual Technology for an application and specific directions on presenting the portfolio.

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 department’s art education advisor to learn more about teacher preparation.
**Artsbus Requirement**

All AVT majors must meet the department’s requirement of travel to galleries and museums through the AVT Artsbus program. Students meet this requirement by enrolling in AVT 300 Artsbus Attendance. The procedure and requirements for enrollment in AVT 300 is the same as for any other class.

Freshmen who enroll as AVT majors must take AVT 300 for five semesters. 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.

**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 “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 AVT undergraduate students must earn a minimum 2.00 cumulative GPA in their major.

**Studios**

The Art and Visual Technology program is located in the arts 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.

Studios are open to students for extended periods mornings, evenings, and weekends whenever classes are not in progress. Policies, procedures, and schedules for studio use are established by the AVT studio faculty and are posted in the studios.

**AVT Honors Program**
Students interested in the Honors Program in Art and Visual Technology should contact the chair of the department. 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.

Academic Policies

Please see College of Visual and Performing Arts academic policies.

Degree Requirements

General Education (37 credits)

Foundation Requirements

- Oral communication (3)
- Quantitative reasoning (3)
- Information technology (3)
- Written communication:
  - ENGL 101 - Composition Credits: 3
  - ENGL 302 - Advanced Composition Credits: 3 Nonnative speakers of English with limited proficiency in the language may substitute ENGL 100 for ENGL 101. Students must attain a minimum grade of C in ENGL 100 or 101, as well as in 302, to fulfill degree requirements.

Core Requirements

- Literature
- Arts* (3)
- Natural science (including at least one laboratory science) (7)
- Western civilization (3)
- Global understanding** (3)
- Social and behavioral sciences (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
  and
• AVT 323 - Drawing II Credits: 4
  or
• AVT 324 - Figure Drawing Credits: 4

Art History, Critical Analysis, Contemporary Practice (24 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
  and
• ARTH 201 - Survey of Western Art Credits: 3

One course from the following:

• ARTH (300 or 400 level)*
  or
• AVT 305 - Creative Processes Credits: 3
• AVT 309 - Art as Social Action Credits: 3
• AVT 318 - History of Graphic Design Credits: 3
• AVT 371 - Visual Perception and the Arts Credits: 3
• AVT 372 - Hip Hop Culture Credits: 3
• AVT 374 - Sound and Vision Credits: 4
• AVT 493 - Teaching Visual Thinking Through Media, PK-12 Credits: 3

Note:

*Students concentrating in graphic design must take AVT 318 to meet this requirement.

Plus

• ARTH 374 - Art Now Credits: 3
• 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

Breadth and Experience (12 credits)
Any three of the following:

- AVT 215 - Typography Credits: 4
- AVT 232 - Painting I Credits: 4
- AVT 243 - Printmaking I Credits: 4
- AVT 252 - Photography I 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 Digital Arts Credits: 4
- AVT 396 - Introduction to Art Teaching and Learning Credits: 3
- AVT 399 - Special Topics in Art and Visual Technology Credits: 1-6

Synthesis (4 credits)

- AVT 497 - Senior Project Credits: 4
  or
- AVT 498 - Senior Design Project Credits: 4

Concentration (24 credits)

24 credits in 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

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

12 credits from:

- AVT 300–499

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
- AVT 415 - Web Design and Usability Credits: 4

8 credits of:

- AVT 419 - Topics in Graphic Design Credits: 1-6

Graphic Design Notes:

AVT 399 or AVT 491 may be taken with permission of the Area Coordinator.

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

12 credits from:

- AVT 372 - Hip Hop Culture Credits: 3
- AVT 374 - Sound and Vision 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

4 credits from:

- AVT 300–499

▲ New Media Art (NMA)

12 credits from:

- AVT 382 - Digital Art and Animation Credits: 4
- AVT 383 - Three-Dimensional Digital Art Credits: 4
- AVT 390 - Digital Media and Video Art Credits: 4
- AVT 482 - Advanced Two-Dimensional Digital Art Credits: 4
- AVT 483 - Internet Art Credits: 4
- AVT 487 - Advanced Digital Media Credits: 4

12 credits from:
- AVT 300–499

▲ Painting (PNT)

- AVT 333 - Painting II Credits: 4
- AVT 432 - Painting III Credits: 4
- AVT 433 - Painting IV Credits: 4

12 credits from:
- AVT 300–499

▲ Photography (PHO)

- AVT 353 - Photography II Credits: 4
- AVT 459 - About Photography: Practice and Research Credits: 4

8 credits from:
- AVT 452 - Advanced Photographic Printing I Credits: 4
- AVT 453 - Advanced Photographic Printing II Credits: 4
- AVT 454 - Alternative Photo Processes Credits: 4
- AVT 455 - Advanced Digital Photo Credits: 4
- AVT 456 - Large Format Photography Credits: 4
- AVT 457 - Documentary Photography Credits: 4
- AVT 458 - Advanced Studio Lighting Credits: 4

8 credits from:
- AVT 300–499

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
8 credits from:

- AVT 345 - Artists' Books as Visual Language Credits: 4
- AVT 346 - Digital Printmaking Credits: 4
- AVT 442 - Printmaking III Credits: 4
- AVT 443 - Printmaking IV Credits: 4

12 credits from:

- AVT 300–499

▲ Sculpture (SCL)

- AVT 363 - Sculpture II Credits: 4
- AVT 462 - Sculpture III Credits: 4
- AVT 463 - Sculpture IV Credits: 4

12 credits from:

- AVT 300–499

General Electives

- General Electives (2-5 credits)

Total: 120 credits

Art and Visual Technology, BFA Curriculum for Students Intending to Pursue the MAT Degree in Art Education

Banner Code: AR-BA-AVT

College Hall, Room C200
Phone: 703-993-8898
Web: www.avt.gmu.edu

Faculty

Harold Linton, Chair

Professors: Carbonneau, Frederick, Kravitz (gallery director), Linton (chair), Mandes, Sandell

Associate professors: Ashcraft (associate chair), Crawford, Feerick, Frenn, White
Assistant professors: Cooley, Cui, Endress, Karametou, Rothstein, Sheridan, Winant (associate chair), Wrbican

Term assistant professors: Constantine, Del Popolo, Malone, Stanley, Starr

Adjunct faculty: Bradley, Bulisova, Carr-Shaffer, Castellana, Chao, Clements, Cushner, DeLuca, Dicicco, Fairfax, Ferreira, Goldman, Gorman, Guerrieri, Herce, Hicks, Ho, Hoffmann, Kerns, Kirk, Nahidian, Organ, Petzwinkler, Rodriguez, Rozario, Sapsford, Serafin, Tomhave, Watson, Wiseman

**Mission**

The Department of Art and Visual Technology (AVT) 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 AVT 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 Department of Art and Visual Technology offers all course work designated AVT in the Courses chapter of this catalog.

**UNDERGRADUATE PROGRAM**

Students who intend to seek licensure to teach art in Virginia public schools or apply for entrance to the master of arts in teaching program for art education are required to pursue a BFA (any concentration) with the following suggested course work listed below. Requirements for acceptance into the BFA program follow the program description listed here.

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 department’s art education advisor to learn more about teacher preparation.

**Admission to AVT Requirements**

All students are admitted to AVT programs of study separately from their admission to the university and only by portfolio review.

New students at Mason may apply to the BFA program upon admission to the university through a portfolio review. Portfolio reviews are scheduled through periodic Admission Office events, or through scheduled dates designated by the AVT Department. Please call the main office to schedule an appointment (703-993-8898).

Current Mason students in the AVT BA program who wish to change their degree program to a BFA, or other current Mason students, may apply for admission to the BFA degree program by presenting a substantive college level portfolio and other requested credentials during the department's designated application period at the end of the sixth week of the fall and spring semester each year. Students planning to apply must meet with the coordinator of their AVT concentration in the semester prior to their application to discuss the portfolio.
For all candidates, admission to the BFA program is highly competitive and requires submission of the following:

For all incoming students:

- Portfolio of 10 to 15 original examples of college-level art work
- One-page, double-spaced essay

In addition, for all transfer students:

- Transcripts of all college-level study
- Must have at least a 3.00 cumulative GPA overall and in the major

Students may alternatively be admitted to study in the BFA program by one of three ways:

- Presenting a portfolio and any other requested credentials at designated portfolio review days before each semester and before applying for admission
- Completing the sequence of AVT 104, 105, and 222 with a 3.25 or higher average in those courses, and applying for admission through a portfolio review
- Completing the sequence of AVT 104, 105, and 222; and 323 or 324; and one other 200-level AVT course with a 3.00 or higher GPA in those courses; and applying for admission through a portfolio review

Students interested in applying should contact the Department of Art and Visual Technology for an application and specific directions on presenting the portfolio.

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 department’s art education advisor to learn more about teacher preparation.

**Artsbus Requirement**

All AVT majors must meet the department’s requirement of travel to galleries and museums through the AVT Artsbus program. Students meet this requirement by enrolling in AVT 300 Artsbus Attendance. The procedure and requirements for enrollment in AVT 300 is the same as for any other class.

Freshmen who enroll as AVT majors must take AVT 300 for five semesters. 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.

**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 “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 AVT undergraduate students must earn a minimum 2.00 cumulative GPA in their major.

**Studios**

The Art and Visual Technology program is located in the arts 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.

Studios are open to students for extended periods mornings, evenings, and weekends whenever classes are not in progress. Policies, procedures, and schedules for studio use are established by the AVT studio faculty and are posted in the studios.

**AVT Honors Program**

Students interested in the Honors Program in Art and Visual Technology should contact the chair of the department. 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.

**Academic Policies**

Please see College of Visual and Performing Arts academic policies.

**Degree Requirements**

**General Education (38 credits)**

**Foundation Requirements**

- Oral communication (3)
- Quantitative reasoning (3)
- Written communication:
- ENGL 101 - Composition Credits: 3
- ENGL 302 - Advanced Composition Credits: 3
  Nonnative speakers of English with limited proficiency may substitute ENGL 100 for ENGL 101. Students must attain a minimum grade of C in ENGL 100 or 101, as well as in 302, to fulfill degree requirements.
Information technology: (Option recommended for BFA/MAT)

- AVT 180 - Computers in the Creative Arts Credits: 3
- CS 105 - Computer Ethics and Society Credits: 1
  or
- PHIL 112 - Ethics and the Cybersociety Credits: 1

Core Requirements

- Literature (3)
- Natural science (including at least one laboratory science) (7)
- Western civilization (3)
- Arts: ARTH 200 counted under AVT major requirements
- Global Understanding: ARTH 203 recommended
- Social and Behavioral Sciences: PSYC 100 recommended
- Synthesis options are specified and counted under AVT major requirements
  Arts (outside the major): (Required for BFA/MAT)
- ARTH 200 - Survey of Western Art Credits: 3

  Global understanding: (Option recommended for BFA/MAT)
- ARTH 203 - Survey of Asian Art Credits: 3

  Social and behavioral sciences: (Option recommended for BFA/MAT)
- PSYC 100 - Basic Concepts in Psychology Credits: 3

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)

Only for students who complete all five of the required undergraduate art education courses (AVT 396, 493, 494, EDUC 301, 302), credits for ARTH 200 may be counted toward the major and the arts university general education requirement

- ARTH 200 - Survey of Western Art Credits: 3
- ARTH 201 - Survey of Western Art Credits: 3
- ARTH 374 - Art Now Credits: 3
• 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 (Meets the ARTH 300+ requirement)
• AVT 494 - Teaching Critical Response to Art, PK-12 Credits: 3 (Meets the AVT 395 writing-intensive requirement)

Note:

AVT 301 must be taken for a total of 3 credits or each semester enrolled, if less than three semesters.

Breadth and Experience (three classes: 9-11 credits)

• AVT 262 - Sculpture I Credits: 4
  or another three dimensional-focused course
• AVT 396 - Introduction to Art Teaching and Learning Credits: 3

One of the following courses: (4 credits)

• AVT 215 - Typography Credits: 4
• AVT 232 - Painting I Credits: 4
• AVT 243 - Printmaking I Credits: 4
• AVT 252 - Photography I Credits: 4
• AVT 253 - Introduction to Digital Photography Credits: 4
• AVT 272 - Interdisciplinary Arts Credits: 4
• AVT 280 - Introduction to Digital Arts Credits: 4
• AVT 399 - Special Topics in Art and Visual Technology Credits: 1-6

Synthesis (4 credits)

• AVT 497 - Senior Project Credits: 4
  or
• AVT 498 - Senior Design Project Credits: 4

Concentration (24 credits)

24 credits in 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
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

12 credits from:

- AVT 300–499

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
- AVT 415 - Web Design and Usability Credits: 4

8 credits of:

- AVT 419 - Topics in Graphic Design Credits: 1-6
  or
- AVT 399 - Special Topics in Art and Visual Technology Credits: 1-6
  or
- AVT 491 - Independent Study in Art and Visual Technology Credits: 1-6

Graphic Design Notes:

AVT 399 or AVT 491 may be taken with permission of Area Coordinator.

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
12 credits from:

- AVT 372 - Hip Hop Culture Credits: 3
- AVT 374 - Sound and Vision 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

4 credits from:

- AVT 300–499

▲ New Media Art (NMA)

12 credits from:

- AVT 382 - Digital Art and Animation Credits: 4
- AVT 383 - Three-Dimensional Digital Art Credits: 4
- AVT 390 - Digital Media and Video Art Credits: 4
- AVT 482 - Advanced Two-Dimensional Digital Art Credits: 4
- AVT 483 - Internet Art Credits: 4
- AVT 487 - Advanced Digital Media Credits: 4

12 credits from:

- AVT 300–499

▲ Painting (PNT)

12 credits from:

- AVT 333 - Painting II Credits: 4
- AVT 432 - Painting III Credits: 4
- AVT 433 - Painting IV Credits: 4

12 credits from:

- AVT 300–499

▲ Photography (PHO)

12 credits from:

- AVT 353 - Photography II Credits: 4
- AVT 459 - About Photography: Practice and Research Credits: 4
8 credits from:

- AVT 452 - Advanced Photographic Printing I Credits: 4
- AVT 453 - Advanced Photographic Printing II Credits: 4
- AVT 454 - Alternative Photo Processes Credits: 4
- AVT 455 - Advanced Digital Photo Credits: 4
- AVT 456 - Large Format Photography Credits: 4
- AVT 457 - Documentary Photography Credits: 4
- AVT 458 - Advanced Studio Lighting Credits: 4

8 credits from:

- AVT 300–499

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

8 credits from:

- AVT 345 - Artists' Books as Visual Language Credits: 4
- AVT 346 - Digital Printmaking Credits: 4
- AVT 442 - Printmaking III Credits: 4
- AVT 443 - Printmaking IV Credits: 4

12 credits from:

- AVT 300–499

▲ Sculpture (SCL)

- AVT 363 - Sculpture II Credits: 4
- AVT 462 - Sculpture III Credits: 4
- AVT 463 - Sculpture IV Credits: 4

12 credits from:

- AVT 300–499
General Electives (2-4 credits)

Take the following art education foundation courses to meet state education requirements:

- EDUC 301 - Educationally Diverse Populations: Handicapped, Gifted, Multicultural Credits: 3
- EDUC 302 - Human Growth and Development Credits: 3

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.

Undergraduate Minor

Art and Visual Technology Minor

Banner Code: AVT

College Hall, Room C200
Phone: 703-993-8898
Web: www.avt.gmu.edu

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

The requirements are as follows:

- AVT 200–299 (4)
- AVT 300–399 (4)
- AVT 104 - Studio Fundamentals I Credits: 4
- AVT 105 - Studio Fundamentals II Credits: 4
- AVT 222 - Drawing I Credits: 4

Total: 20 credits
Master's Degree

Art and Visual Technology, MFA

Banner Code: AR-MFA-AVT

College Hall, Room C200
Phone: 703-993-8898
Web: www.avt.gmu.edu

Faculty

Harold Linton, Chair

Professors: Carbonneau, Frederick, Kravitz (gallery director), Linton (chair), Mandes, Sandell

Associate professors: Ashcraft (associate chair), Crawford, Feerick, Frenn, White

Assistant professors: Cooley, Cui, Endress, Karametou, Rothstein, Sheridan, Winant (associate chair), Wrbican

Term assistant professors: Constantine, Del Popolo, Malone, Stanley, Starr

Adjunct faculty: Bradley, Bulisova, Carr-Shaffer, Castellana, Chao, Clements, Cusnher, DeLuca, Dicicco, Fairfax, Ferreira, Goldman, Gorman, Guerrieri, Herce, Hicks, Ho, Hoffmann, Kerns, Kirk, Nahidian, Organ, Petzwinkler, Rodriguez, Rozario, Sapsford, Serafin, Tomhave, Watson, Wiseman

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 digital arts, 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 AVT 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. 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. Portfolio requirements are different for each graduate area of emphasis.

All portfolios must include a slide sheet or CD containing the candidate's images plus an accompanying printed informational sheet that lists the corresponding number, title, date, medium, and size of each work. If slides are included, each image must be labeled with slide number, applicant’s name, title of work, and date. CD's must be labeled with the candidate's name. 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. For more information, contact the AVT Department at 703-993-8898.

Portfolio requirements by area of emphasis:

Digital Arts: 20 images on a Mac (Apple Macintosh platform)- compatible CD. All images on the CD must be numbered and correspond to the accompanying printed list submitted on a separate sheet. 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. Digital arts applicants should not submit slides.

Photography and Printmaking: 20 images on a Mac-compatible CD or slides. All images on the CD must be numbered and correspond to the accompanying printed list submitted on a separate sheet. Printmaking also requires a print portfolio of 12 original prints.

Sculpture and Painting: 20 slides only. All slides must be numbered and labeled and correspond to the accompanying printed list on a separate sheet.

InterArts: 20 images (on a Mac-compatible CD or slides), videos, or writing-based materials. All images on the CD must be numbered and correspond to the accompanying printed list submitted on a separate sheet. If videos are included, they must contain no more than four minutes for each selection. Also, they must be on a Mac-compatible CD or DVD or, if videotape, VHS in NTSC format. 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. Supplementary material should be clearly marked as such.

Studios

The Art and Visual Technology program is located in the arts 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.

Studios are open to students for extended periods mornings, evenings, and weekends whenever classes are not in progress. 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 (30 credits)

- AVT 500+ Art and Visual Technology Course Work (10)
- AVT 599 - Special Topics in Art and Visual Technology Credits: 1-6
- AVT 600 - Research Methodologies Credits: 3
- AVT 610 - Graduate Seminar Credits: 1-4 (1 credit repeated for 4 credits)
- AVT 620 - Theory, Criticism, and the Visual Arts Credits: 3
- AVT 670 - Teaching Practicum Credits: 3 or 6

Note

AVT 599 must be taken for a total of 4 credits

Studio Emphases (15 credits)

MFA students must complete 15 credits in digital arts, InterArts, painting, photography, printmaking, or sculpture, as follows:

Digital Arts Emphasis

Any three of the following courses:

- AVT 616 - Networked Art Practice Credits: 5
- AVT 676 - Sound and Music for Video and Animation Credits: 5
- AVT 678 - Interface and CD-ROM Design Credits: 5
- AVT 684 - Two-Dimensional Digital Art Credits: 5
- AVT 686 - Three-Dimensional Digital Art Credits: 5
- AVT 688 - Digital Animation Credits: 5

InterArts Emphasis

Any three graduate studio courses as approved by the division director of InterArts, for a total of 15 credits. InterArts graduate students may combine courses from the studio areas of emphasis and work with faculty to design an interdisciplinary thesis project.

Painting Emphasis

All three of the following courses:

- AVT 632 - Graduate Painting I Credits: 5
- AVT 633 - Graduate Painting II Credits: 5
• AVT 634 - Advanced Graduate Painting Credits: 5

Photography Emphasis

All three of the following courses:

• AVT 652 - Graduate Photography I Credits: 5
• AVT 653 - Graduate Photography II Credits: 5
• AVT 654 - Advanced Graduate Photography Credits: 5

Printmaking Emphasis

All three of the following courses:

• AVT 642 - Graduate Printmaking I Credits: 5
• AVT 643 - Graduate Printmaking II Credits: 5
• AVT 644 - Advanced Graduate Printmaking Credits: 5

Sculpture Emphasis

All three of the following courses:

• AVT 662 - Graduate Sculpture I Credits: 5
• AVT 663 - Graduate Sculpture II Credits: 5
• AVT 664 - Advanced Graduate Sculpture Credits: 5

MFA Comprehensive Experience (15 credits)

Candidates must complete all of the above core and studio requirements as well as the following:

• AVT 796 - Directed Project, Directed Reading, Thesis Credits: 1-9
• AVT 798 - Directed Project, Directed Reading, Thesis Credits: 3
• AVT 799 - Directed Project, Directed Reading, Thesis Credits: 1-3

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.

AVT 796 must be taken for a total of 9 credits

AVT 799 must be taken for a total of 3 credits

Total: 60 credits
Art Education

Renee Sandell, Program Director
Phone: 703-993-8562
Web: arteducation.gmu.edu

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 practicum experience, and studio work prior to preservice teaching internship and seminar.

Academic Policies

Please see College of Visual and Performing Arts academic policies.

Master's Degree

Art Education, MAT

Banner Code: AR-MAT-ARTE

Renee Sandell, Program Director
Phone: 703-993-8562
Web: arteducation.gmu.edu

GRADUATE PROGRAM

The master of arts in teaching in art education is a pre-service 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, and studio work prior to pre service teaching internship and seminar.

The MAT in Art Education Program fosters the quality studio breadth and expertise; comprehensive art historical knowledge; access to contemporary, local, and global art forms and artists; and proficiency in art education theory and practice needed to prepare highly qualified art teachers for a lifetime of professional teaching, learning, and leadership.

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; any exceptions will be considered on an individual basis. 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.
Applications will be accepted for fall and spring semesters. The deadline for receipt of application materials is October 15 and March 15. 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
- TOEFL score, if required by Mason policies
- Portfolio of 15 to 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.

MAT matriculants 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 a set of five BFA foundational courses in art education and education: AVT 396, 493 and 494 and EDUC 301 and 302.

In addition, applicants who did not take equivalent undergraduate courses must also take AVT 472 Critical Theory in the Visual Arts and AVT 180 Computers in the Creative Arts, plus any additional studio or art history course work to meet Virginia licensure requirements.

**Professional Teaching Portfolio and Qualifications Review**

The comprehensive experience for the MAT 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.

**Academic Policies**

Please see College of Visual and Performing Arts academic policies.

**Degree Requirements**

- AVT 605 - Issues and Research in Art Education Credits: 3
- AVT 615 - Technology for Art Teachers Credits: 3
AVT 667 - Two-Dimensional Art Making: Form, Theme, and Context Credits: 4
AVT 668 - Three-Dimensional Art Making across Cultures Credits: 4
AVT 691 - Elementary Art Education Credits: 3
AVT 692 - Secondary Art Education Credits: 3
AVT 695 - Internship in Art Education (Student Teaching) Credits: 6
AVT 696 - Seminar for Student Teachers Credits: 1
EDRD 501 - Literacy and Curriculum Integration, PK-12 Credits: 3

Total: 30 credits

Notes:

MAT students will receive ongoing evaluation reviews by the MAT faculty to determine whether they have achieved satisfactory progress toward their degree.

All MAT students must pass Praxis II and Virginia Communication and Language Assessment (VCLA) to receive placement for student teaching in the final semester.

Arts Management

4260 Chain Bridge Road
Fairfax, VA 22030
Phone: 703-993-8926
Web: artsmanagement.gmu.edu

Faculty

Richard Kamenitzer, Program Director

Professor: Reeder

Associate professors: Brindle, Marcus, Martin

Term associate professor: Kamenitzer (program director)

Adjunct faculty: Allen, Berardelli, Bienvenu, Case, Coppage, Dawn, Denhardt, Haputle, Hill, Huschle, Kaiser, Kraft, Lopez, Madden, Murray, Richard, Simpson, Smyers, Thompson

Course Work

The Arts Management Program offers all course work designated MAM in the Courses chapter of this catalog.

Graduate Certificates:

Arts Entrepreneurship
The Arts Entrepreneurship certificate is for early to mid-career professionals working at least tangentially in an arts-related profit or nonprofit business. Participants will augment their existing knowledge by examining innovative case studies, studying advanced practices and processes, and the actual execution of business models.

**Fund Raising and Development in the Arts**

The Fund Raising and Development certificate is especially helpful for mid-career professionals. It focuses on the practical application of development principles, writing and communication skills, and strategic planning.

**Public Relations and Marketing in the Arts**

The Public Relations and Marketing in the Arts certificate focuses on strategic planning, development and implementation of public relations and marketing in arts organization for the beginning and mid-level professional.

**Special Events Management in the Arts**

The Special Events Management in the Arts certificate is for the entry level or mid-level professional to increase their skills in the fast paced and creative field of events management.

**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 23-credit core and then select courses from a cluster: entrepreneurship in the arts and management; finance and budgeting for the arts; marketing and public relations; or an arts-specific cluster. 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 1 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

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.

Master's Degree

Arts Management, MA

Banner Code: AR-MA-AMGT

4260 Chain Bridge Road
Fairfax, VA 22030
Phone: 703-993-8926
Web: artsmanagement.gmu.edu

Faculty

Richard Kamenitzer, Program Director

Professor: Reeder

Associate professors: Brindle, Marcus, Martin

Term associate professor: Kamenitzer (program director)

Adjunct faculty: Allen, Berardelli, Bienvenu, Case, Coppage, Dawn, Denhardt, Haupte, Hill, Huschle, Kaiser, Kraft, Lopez, Madden, Murray, Richard, Simpson, Smyers, Thompson

Course Work

The Arts Management program offers all course work designated MAM in the Course Descriptions chapter of this catalog.

PROGRAM

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The MA is a 36-credit program of study that provides a core curriculum in the fundamentals of arts management. Students complete a 23-credit core and then select courses from a cluster: entrepreneurship in the arts and management; finance and budgeting for the arts; marketing and public relations; or an arts-specific cluster. 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.

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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 1 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

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 (23 credits)

- MAM 601 - Fund Raising/Development in Arts Credits: 3
- MAM 602 - Seminar in Arts Management Credits: 3
- MAM 603 - Arts in Society Credits: 3
- MAM 604 - Public Relations and Marketing Strategies for the Arts Credits: 3
- MAM 606 - Board of Directors Management Credits: 3
- MAM 704 - Finance and Budgeting for Arts Organizations Credits: 3
- MAM 705 - Budgeting/Finance for Arts Organizations II Credits: 2
- MAM 710 - Arts Policy Credits: 3

Internships (6 credits)

- MAM 740 - Internal Internship-Laboratory Rotation Credits: 2
• MAM 790 - External Internship Credits: 2-4

Clusters of Electives (7 credits)

Select a cluster of electives:

Entrepreneurship in the Arts and Management

• MAM 712 - Grant Writing in the Arts Credits: 1
• MAM 750 - Arts Entrepreneurship I Credits: 3
• MAM 751 - Arts Entrepreneurship II Credits: 3

Finance and Budgeting for the Arts

• MAM 712 - Grant Writing in the Arts Credits: 1
• MAM 711 - Directed Readings and Project Course Credits: 1-6

Marketing and Public Relations

Select from the following courses:

• MAM 599 - Special Topics in Arts Management Credits: 1-6
• MAM 607 - Fund Raising/Development in Arts II Credits: 3
• MAM 608 - Executive Management of Arts Communications Credits: 3
• MAM 711 - Directed Readings and Project Course Credits: 1-6

Arts/Arts Management Specific Cluster

• MAM 599 Gallery Management (3)

Four credits of course work in arts management, art and visual technology, dance, music, and theater determined in conjunction with the program director.

Total: 36 credits

Master's Level Certificate

Arts Entrepreneurship Graduate Certificate

Banner Code: AR-CERG-AENT
The 15-credit Graduate Certificate in Arts Entrepreneurship is for early to mid-career professionals working at least tangentially in an arts-related profit or nonprofit business. Participants will augment their existing knowledge by examining innovative case studies, studying advanced practices and processes, and the executing business models. Certificate courses will address areas of idea generation, market analysis and testing, arts business and revenue modeling, public relations and marketing strategies, budgeting and finance, public policy, and government relations. Learning together in a cohort-modeled certificate program, students will develop strong interpersonal skills, public communication strategies, and team-based problem-solving strategies.

**Admission Requirements**

For admission into the arts entrepreneurship certificate, prospective students must show graduation from a bachelor’s program (or equivalent) and related work experience. Students apply through Mason’s Office of Admissions, and applications will be approved by a committee established by the Arts Management Program. Courses taken in pursuit of the certificate are eligible to be applied toward the master of arts in arts management, if these courses meet approval.

**Certificate Requirements**

- Electives as approved by the Arts Management Program Credits: 3
- MAM 604 - Public Relations and Marketing Strategies for the Arts Credits: 3
- MAM 704 - Finance and Budgeting for Arts Organizations Credits: 3
- MAM 750 - Arts Entrepreneurship I Credits: 3
- MAM 751 - Arts Entrepreneurship II Credits: 3

Total: 15 credits

**Fund Raising and Development in the Arts Graduate Certificate**

**Banner Code: AR-CERG-FRDA**

The ability to create, direct, and manage fundraising and development departments within not-for-profit organizations can be most challenging for Arts Managers. The 18 credit Fund Raising and Development in the Arts Graduate Certificate Program, especially helpful for mid-career professionals, focuses on the practical application of development principles, writing and communication skills, and strategic planning. A grants writing class adds to the much needed knowledge of not only how to write grants but also how funders are most motivated to fund operating expenses, management training, and special projects. Both of the budget and finance classes equip professionals with the skills to keep arts organizations financially sound and meet the goals of contributed and non-contributed income.

**Admission Procedures and Requirements**

For admission into the Fund Raising and Development in the Arts Graduate Certificate Program, prospective students must show graduation from a Bachelor's program (or equivalent) and related work experience. Students will apply through Mason’s Office of Admissions, and applications will be approved by a committee established by the Arts Management Program.

**Core Courses (18 credits)**
Public Relations and Marketing in the Arts Graduate Certificate

Banner Code: AR-CERG-PRMA

The Public Relations and Marketing in the Arts Graduate Certificate Program focuses on strategic planning, development and implementation of public relations and marketing in arts organizations for the beginning and mid-level professional. Specific areas of audience, community, and markets in relation to applied marketing media and advertising are studied to improve continuance of current audiences and connecting new patrons. Creative and sound practices in both executing and managing communications are presented. Budget and finance courses round out the 18 credit program to safeguard arts organizations to be financially healthy with both short term and long term goals strategically in place.

Admission Procedures and Requirements

For admission to the Public Relations and Marketing in the Arts Graduate Certificate Program, prospective students must show graduation from a Bachelor's program (or equivalent) and related work experience. Students will apply through Mason's Office of Admissions, and applications will be approved by a committee established in the Arts Management Program.

Core Courses (18 credits)

- MAM 601 - Fund Raising/Development in Arts Credits: 3
- MAM 602 - Seminar in Arts Management Credits: 3
- MAM 604 - Public Relations and Marketing Strategies for the Arts Credits: 3
- MAM 608 - Executive Management of Arts Communications Credits: 3
- MAM 704 - Finance and Budgeting for Arts Organizations Credits: 3
- MAM 705 - Budgeting/Finance for Arts Organizations II Credits: 2
- MAM 711 - Directed Readings and Project Course Credits: 1-6
- MAM 712 - Grant Writing in the Arts Credits: 1

Special Events Management in the Arts Graduate Certificate

Banner Code: AR-CERG-SEMA
The 17 credit Special Events Management in the Arts Graduate Certificate Program is for the entry level or mid-level professional to increase their skills in the fast paced and creative field of events management. Whether as an addition to a performing arts event or a stand alone gala, festival or fund raiser, the special events manager must combine their professional perspective with much creativity and marketability. The Festival and Special Events course specifically focuses on the different stages of creative idea development, planning, budgeting, marketing, networking, gaining financial and volunteer support, design, decor, and additional special attention to details to make an event successful and memorable.

Admission Procedures and Requirements

For admission into the Special Events Management in the Arts Graduate Certificate Program, prospective students must show graduation from a Bachelor's program (or equivalent) and related work experience. Students will apply through Mason's Office of Admission and applications will be approved by a committee established by the Arts Management Program.

Core Courses (17 credits)

- MAM 601 - Fund Raising/Development in Arts Credits: 3
- MAM 602 - Seminar in Arts Management Credits: 3
- MAM 604 - Public Relations and Marketing Strategies for the Arts Credits: 3
- MAM 704 - Finance and Budgeting for Arts Organizations Credits: 3
- MAM 705 - Budgeting/Finance for Arts Organizations II Credits: 2
- MAM 706 - Festivals and Special Events Credits: 3

Computer Game Design

Performing Arts Building, Room A407
Phone: 703-993-1321
Web: cvpa.gmu.edu/game-design

Faculty

Scott Martin, Program Director

Associate Professor: Martin (program director)

Term Assistant Professor: 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.

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 seeking a BFA in computer game design should speak with the program director about this requirement.

**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 for college academic policies.

**Undergraduate Degree**

**Computer Game Design, BFA**

**Banner Code:** AR-BFA-GAME

Performing Arts Building, Room A407  
Phone: 703-993-1321  
Web: game.gmu.edu

**Faculty**

Scott Martin, Program Director

**Associate Professor:** Martin (program director)

**Term Assistant Professor:** 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.

**Course Work**

The Computer Game Design program offers all course work designated GAME in the Course Descriptions 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.

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 (42-43 credits)

- ENGL 101 - Composition Credits: 3
  or
- ENGL 100 - Composition for Non-native Speakers of English Credits: 4
- ENGL 302 - Advanced Composition Credits: 3
- AVT 180 - Computers in the Creative Arts Credits: 3
  or
- CS 112 - Introduction to Computer Programming Credits: 4
- CS 105 - Computer Ethics and Society Credits: 1
- MATH 113 - Analytic Geometry and Calculus I Credits: 4
- ENGL 201 - Reading and Writing about Texts Credits: 3
- MUSI 100 - Fundamentals of Music Credits: 3
- PHYS 160 - University Physics I Credits: 3
- PHYS 161 - University Physics I Laboratory Credits: 1
- DANC 118 - World Dance Credits: 3
  or
- MUSI 103 - Musics of the World Credits: 3
- PSYC 100 - Basic Concepts in Psychology Credits: 3

Oral Communication, Natural Science Nonlab, and Western Civilization
Approved courses may be found under the University General Education section of this catalog.

Major Core (57 credits)

- AVT 104 - Studio Fundamentals I Credits: 4
- AVT 280 - Introduction to Digital Arts Credits: 4
- CS 123 - Computing: From the Abacus to the Web Credits: 3
- 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 Gaming and File Sharing 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 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 431 - Consumer Game Platform Analysis Credits: 3
- GAME 490 - Senior Project Credits: 3
- GAME 491 - Internship Credits: 4
- MUSI 101 - Introduction to Classical Music Credits: 3

Digital Media Electives (10 credits)

Select three courses from the following (one from AVT required or advisor's approval)

- AVT 390 - Digital Media and Video Art Credits: 4
- AVT 487 - Advanced Digital Media Credits: 4
- COMM 355 - Video Principles and Practices Credits: 3
- ENGL 332 - Introduction to Film Credits: 3
- FAVS 399 - Special Topics in Film and Video Studies Credits: 1-3

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 - Photography I Credits: 4
- AVT 262 - Sculpture I Credits: 4
General Electives (2-3 credits)

Total: 120 credits

■ Dance

Performing Arts Building, Room A300
Phone: 703-993-1114
Web: dance.gmu.edu

Faculty

Elizabeth Price, Chair

Professors: Lepore, Miller, Shields

Associate professors: Price (chair), Studd

Assistant professors: Joyce

Term Assistant Professors: Dinapoli, Fang, Reedy, Willis

Adjunct Faculty: Bush, Clancy, Cronmiller, Goodson, Koucheravy, Lee, Lees, Mattingly, Nuamah, Summerall, Volberg, Windom

Course Work

The Department of Dance offers all course work designated DANC in the Courses chapter of this catalog.

UNDERGRADUATE PROGRAMS

The Dance Department 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 department web page, dance.gmu.edu, or by calling the department 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 ENGL 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 300, 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 300 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 postbaccalaureate semester.

**Academic Policies**

Please see College of Visual and Performing Arts for college academic policies.

**GRADUATE PROGRAM**

The MFA in dance is a 60-credit program of study grounded in the modern dance genre that emphasizes performance, choreography, and teaching in higher education. Candidates are expected to enter the program with significant professional performance at the national or international level, advanced technical proficiency in ballet or modern technique, and professional competence in choreography exemplified by a significant body of work.

**Admission Requirements**

In addition to fulfilling the admission requirements for graduate study, the applicant must submit directly to the Dance Department a résumé and a 10-minute video that illustrates the applicant’s choreography. All candidates must also demonstrate advanced technical proficiency through an audition. Contact the Dance Department at 703-993-1114 for dates and times.

All candidates must satisfy the following prerequisites: advanced dance technique, improvisation, two semesters of dance composition, two semesters of dance history, rhythmic analysis or music for dance, anatomy and kinesiology, and dance production. Prerequisite courses may be completed before or concurrent with graduate course work and 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, Chair

Professors: Lepore, Miller, Shields

Associate professors: Price (chair), Studd

Assistant professors: Joyce

Term Assistant Professors: Dinapoli, Fang, Reedy, Willis

Adjunct Faculty: Bush, Clancy, Cronmiller, Goodson, Koucheravy, Lee, Lees, Mattingly, Nuamah, Summerall, Volberg, Windom

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 department web page, dance.gmu.edu, or by calling the department office at 703-993-1114. Admission to the university is determined by the Admissions Office.

Course Work

The Department 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 ENGL 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 300, 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 300 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 postbaccalaureate semester.

**Degree Requirements**

**General Education (58-67 credits)**

**Foundation**

**Written Communication:**

Nonnative speakers of English with limited proficiency in the language may substitute ENGL 100 for ENGL 101. Students must attain a minimum grade of C in ENGL 100 or 101, as well as in 302, to fulfill degree requirements.

- ENGL 101 - Composition Credits: 3
- ENGL 302 - Advanced Composition Credits: 3

**Foundation Requirements:**

- Oral communication (3)
- Quantitative reasoning (3)
- Information technology (3)

**Core Requirements**

- Literature (3)
- Natural science (must include a laboratory science) (7)
- Western civilization (3)
• Global understanding (3)
• Social science (3)
• Philosophy or religion (3)

Arts:
• MUSI 101 - Introduction to Classical Music (3)
• AVT/ARTH (3)
• THR 210 - Acting I (3)

Synthesis
• DANC 490 - Senior Dance Seminar Credits: 3

Other

Foreign language* (0–9):
• Elementary (6)
• Intermediate (3–6)
*See beginning of this chapter for foreign language requirement.

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 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 325 - Intermediate Modern Dance Credits: 1-3
• DANC 345 - Intermediate Ballet Credits: 1-3
• DANC 370 - Dance Performance Credits: 1
• DANC 390 - Dance History: Pre-Twentieth Century Credits: 3
• DANC 391 - Dance History: Twentieth Century Credits: 3
• DANC 425 - Advanced Modern Dance Credits: 1-3
• DANC 445 - Advanced Ballet Credits: 1-3
• DANC 454 - Methods of Teaching Dance Credits: 3
• DANC 480 - Introduction to Laban Movement Analysis Credits: 3

Technique and Performance Credits

Dance BA majors required to take:

DANC 325/425 Modern Technique (6 credits)
DANC 345/445 Ballet Technique (3 credits)

DANC 370 Performance (2 credits)

**Dance Electives (7 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 231 - Intermediate Jazz Technique Credits: 3
- DANC 245 - Beginning Intermediate Ballet Credits: 3
- DANC 314 - Music Accompaniment for Dance 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: 1
- DANC 331 - Advanced Jazz Dance Credits: 3
- DANC 345 - Intermediate Ballet Credits: 1-3
- DANC 350 - Advanced Dance Improvisation Credits: 1-3
- DANC 362 - Directed Choreography Credits: 1
- DANC 370 - Dance Performance Credits: 1
- DANC 371 - Residency Workshop Credits: 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**

- Electives (6-15)

**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, Chair

Professors: Lepore, Miller, Shields

Associate professors: Price (chair), Studd

Assistant professors: Joyce

Term Assistant Professors: Dinapoli, Fang, Reedy, Willis

Adjunct Faculty: Bush, Clancy, Cronmiller, Goodson, Koucheravy, Lee, Lees, Mattingly, Nuamah, Summerall, Volberg, Windom

UNDERGRADUATE PROGRAM

The Dance Department offers a BFA. Entrance to the program is by audition. Information about the audition process, including dates and audition application, can be found on the department web page, dance.gmu.edu, or by calling the department office at 703-993-1114. Admission to the university is determined by the Admissions Office.

Because of the professional nature of the BFA degree, the program requires completion of 126 credits of course work. The BFA in dance is a performance-oriented 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.

The BFA degree offers a modern dance major that allows for concentrated study in performance, choreography, or teaching. Daily technical training includes ballet, a strong emphasis on modern dance, and opportunities to study jazz and world dance forms. Students may request admission into the BFA program during the candidate’s freshman year. Student progress in the BFA program is assessed annually.

Course Work

The Department 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
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 ENGL 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 300, 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 300 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 postbaccalaureate semester.

Degree Requirements

General Education (43 credits)

Foundation

Written Communication:

Nonnative speakers of English with limited proficiency in the language may substitute ENGL 100 for ENGL 101. Students must attain a minimum grade of C in ENGL 100 or 101, as well as in 302, to fulfill degree requirements.

- ENGL 101 - Composition Credits: 3
- ENGL 302 - Advanced Composition Credits: 3

Foundation Requirements:

- Quantitative reasoning (3)
- Information technology (3)
Core Requirements

- Literature (3)
- Natural science (must include one laboratory science) (7)
- Western civilization (3)
- Global understanding (3)
- Social science (3)

Arts:
- MUSI 101 - Introduction to Classical Music (3)
- AVT/ARTH (3)
- THR 210 - Acting I (3)

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 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 325 - Intermediate Modern Dance Credits: 1-3
- DANC 345 - Intermediate Ballet Credits: 1-3
- DANC 360 - Choreography Credits: 3
- DANC 362 - Directed Choreography Credits: 1
- DANC 370 - Dance Performance Credits: 1
- DANC 372 - Advanced Dance Production Credits: 1
- DANC 390 - Dance History: Pre-Twentieth Century Credits: 3
- DANC 391 - Dance History: Twentieth Century Credits: 3
- DANC 425 - Advanced Modern Dance Credits: 1-3
- DANC 445 - Advanced Ballet Credits: 1-3
- DANC 454 - Methods of Teaching Dance Credits: 3
- DANC 480 - Introduction to Laban Movement Analysis Credits: 3

Technique and Performance Credits

Dance BFA majors required to take:

DANC 325/425 Modern Technique (18 credits)

DANC 345/445 Ballet Technique (9 credits)
DANC 370 Performance (4 credits)

Dance Electives (15 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 314 - Music Accompaniment for Dance 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: 1
- DANC 331 - Advanced Jazz Dance Credits: 3
- DANC 345 - Intermediate Ballet Credits: 1-3
- DANC 350 - Advanced Dance Improvisation Credits: 1-3
- DANC 362 - Directed Choreography Credits: 1
- DANC 370 - Dance Performance Credits: 1
- DANC 371 - Residency Workshop Credits: 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

- Electives (3)

Total: 126 credits

Undergraduate Minor
Dance Appreciation Minor

Banner Code: DANC

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

All minors must complete the following courses:

Core (6 credits):

All minors must complete the following courses:

- 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 nine credits of technique courses at the 200 level.

All minors must demonstrate a basic level of training in both modern dance and ballet, and therefore, complete nine 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 131 - Beginning Jazz Technique Credits: 3
- DANC 161 - Beginning Tap Dance Credits: 3
- DANC 231 - Intermediate Jazz Technique 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 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, Chair

Professors: Lepore, Miller, Shields

Associate professors: Price (chair), Studd

Assistant professors: Joyce

Term Assistant Professors: Dinapoli, Fang, Reedy, Willis

Adjunct Faculty: Bush, Clancy, Cronmiller, Goodson, Koucheravy, Lee, Lees, Mattingly, Nuamah, Summerall, Volberg, Windom

GRADUATE PROGRAM

The MFA in dance is a 60-credit program of study grounded in the modern dance genre that emphasizes performance, choreography, and teaching in higher education. Candidates are expected to enter the program with significant professional performance at the national or international level, advanced technical proficiency in ballet or modern technique, and professional competence in choreography exemplified by a significant body of work.
Admission Requirements

In addition to fulfilling the admission requirements for graduate study, the applicant must submit directly to the Dance Department a résumé and a 10-minute video that illustrates the applicant’s choreography. All candidates must also demonstrate advanced technical proficiency through an audition. Contact the Dance Department at 703-993-1114 for dates and times.

All candidates must satisfy the following prerequisites: advanced dance technique, improvisation, two semesters of dance composition, two semesters of dance history, rhythmic analysis or music for dance, anatomy and kinesiology, and dance production. Prerequisite courses may be completed before or concurrent with graduate course work and 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

- DANC 501 - Graduate Dance Seminar Credits: 3
- DANC 525 - Advanced Modern Dance Credits: 1-3
- DANC 545 - Advanced Ballet Credits: 1-3
- DANC 560 - Advanced Choreography Credits: 3
- DANC 570 - Advanced Dance Performance Credits: 1-3
- DANC 571 - Residency Workshop Credits: 1
- DANC 580 - Laban Movement Analysis Credits: 3
- DANC 598 - Philosophy and Aesthetics of Dance Credits: 3
- DANC 615 - Contemporary Trends Credits: 3
- DANC 627 - Advanced Teaching Seminar Credits: 3
- DANC 680 - Dance Management Credits: 3
- DANC 790 - Internship Credits: 1-3
- DANC 799 - Thesis Credits: 1-6

Technique and Performance Credits

All MFA majors are required to take 18 credits of technique classes distributed as follows:

DANC 525 Modern Technique (9-12 credits)
DANC 545 Ballet Technique (6-9 credits)

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: 703-993-1992  
Web: www.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; 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; Richard Kamenitzer, Arts Management; Howard Kurtz, Theater; Alison Landsberg, History and Art History; Scott Martin, Arts Management; Kristina Olsen, Modern and Classical Languages; Paula Petrik, History and Art History; Janine Ricouart, Modern and Classical Languages; Mark Sample, English; Jessica Scarlata, English; 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) now 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.

**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.

**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: 703-993-1992
Web: www.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; 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; Richard Kamenitzer, Arts Management; Howard Kurtz, Theater; Alison Landsberg, History and Art History; Scott Martin, Arts Management; Kristina Olsen, Modern and Classical Languages; Paula Petrik, History and Art History; Janine Ricouart, Modern and Classical Languages; Mark Sample, English; Jessica Scarlata, English; 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) now 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.

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.

Academic Policies

Please see College of Visual and Performing Arts for college academic policies.

Degree Requirements
General Education (40 credits)

Foundation Requirements

- Oral communication (3)
- Information technology (3)

Quantitative reasoning:
  - Either appropriate placement score on quantitative skills and one of
    - MATH 108 - Introductory Calculus with Business Applications,
    - MATH 110 - Introductory Probability and Statistics,
    - MATH 111 - Linear Mathematical Modeling,
    - MATH 113 - Analytic Geometry and Calculus I,
    - MATH 115 - Analytic Geometry and Calculus I (Honors),
    - MATH 125 - Discrete Mathematics I;
    - or
    - IT 250;
    - or
    - STAT 250 - Introductory Statistics I;
    - or
    - lower placement score requiring MATH 106.

- ENGL 101 - Composition Credits: 3
- ENGL 302 - Advanced Composition Credits: 3

Core Requirements

- Literature (3)
- Arts (3)
- Natural science (including one laboratory science) (7)
- Western civilization (3)
- Global understanding (3)
- Social and behavioral sciences (3)
- Synthesis requirement (3)
- Foreign language or a minor (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 (48 credits)

Film and Video Studies Core Requirements (30 credits)
Students must earn a minimum grade of C in all core courses (AVT 204; COMM 355, 454; ENGL 331, 332; FAVS 100, 355, 450, 499; THR 482).

- 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
- ENGL 331 - Introduction to Documentary Credits: 3
- ENGL 332 - Introduction to Film Credits: 3
- FAVS 100 - Film and Video Studies Colloquium Credits: 1
- FAVS 355 - Film Business Practices Credits: 3
- FAVS 450 - Internship in Film and Video Studies Credits: 3
- FAVS 499 - Senior Project Credits: 3
- THR 482 - Advanced Screenplay Workshop Credits: 3

Note:
FAVS 100 must be taken for a total of 3 credits.

**Analysis, History, Theory (6 credits)**

Take 6 credits from the following:

- CHIN 320 - Contemporary Chinese Film Credits: 3
- COMM 255 - Introduction to Media Literacy Credits: 3
- COMM 365 - Women and Media Credits: 3
- COMM 380 - Media Criticism Credits: 3
- ENGL 334 - Literary Approaches to Popular Culture Credits: 3
- ENGL 421 - Topics in Film History Credits: 3
- ENGL 422 - Topics in Film Theory Credits: 3
- ENGL 490 - Special Topics in Film Credits: 3
- ENGL 493 - Special Topics in Popular Literature Credits: 3
- FREN 470 - Topics in French Cinema Credits: 3
- HIST 393 - Topics in Film and History Credits: 3
- JAPA 320 - Japanese Cinema Credits: 3
- RUSS 470 - Topics in (Post) Soviet Film Credits: 3

**Video Production (6 credits)**

Take 6 credits from the following:

- AVT 354 - Digital Photo Credits: 4
- AVT 356 - Studio Lighting I Credits: 4
- AVT 374 - Sound and Vision Credits: 4
- AVT 376 - Live Movies Credits: 4
- AVT 382 - Digital Art and Animation Credits: 4
• AVT 383 - Three-Dimensional Digital Art Credits: 4
• AVT 390 - Digital Media and Video Art Credits: 4
• AVT 457 - Documentary Photography Credits: 4
• AVT 482 - Advanced Two-Dimensional Digital Art Credits: 4
• AVT 487 - Advanced Digital Media Credits: 4
• COMM 358 - Video Producing and Directing Credits: 3
• COMM 360 - Video Editing Credits: 3
• COMM 363 - Media Career Seminar Credits: 1
• COMM 366 - Visual Communication Credits: 3
• COMM 399 - Special Topics in Communication Credits: 1-3
• FAVS 365 - Documentary Filmmaking I Credits: 3
• THR 230 - Introduction to Technical Theater Credits: 3
• THR 235 - Fundamentals of Costume Construction Credits: 3
• THR 314 - Lighting Stagecraft Credits: 3
• THR 334 - Lighting Design Credits: 3
• THR 336 - Advanced Theater Technology Credits: 3
• THR 423 - Audition Techniques: Stage and Camera Credits: 3

Note:

See Program Director for COMM 399 specifics.

Electives in Area of Specialization (6 credits)

Students are required to take two courses demonstrating a focus in subject matter, possibly from the following departments:

• History,
• Music,
• Psychology,
• Sociology and Anthropology,
  or
• Theater.

General Electives (32)

Students must use general electives to either complete a minor program outside the major field of study or demonstrate intermediate-level proficiency in one foreign language.

Total: 120 credits

■ Music
Faculty

James Gardner, Chair

Professors: Camphouse, Carroll, Engebretson, J. Gardner (chair), Maiello, Miller, Monson (associate chair), Smith

Term professor: Balakerskaia, Hearden, Johonnott, Lapple

Associate professors: Billingham, T. Owens

Term associate professors: Casagrande, Ker-Hackleman, Rendler

Assistant professors: Bergman, Guessford, Nickens, Novak, Robinson

Adjunct Faculty: Beach, Beckwith, Behrend, Berkshire-Brown, Berger, Conlon, Crabill, East, Gerber, Haroutounian, Healey, Hughes, Kilkenny, McCarthy, M. Owens, Parrell, Rittenhouse, Roberts, Snitzler, Stephansky, Sternbach, Taylor, von Villas, Watters, Wenner

Course Work

The Music Department offers all course work designated MUSI in the Courses chapter of this catalog.

UNDERGRADUATE PROGRAMS

The two undergraduate degree programs offered through the Department 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 department enables students to pursue worthwhile vocational goals as teachers, performers, conductors, and composers. The department 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 department 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 department 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 department 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 Department of Music before the scheduled audition date. Auditions are held approximately once per month. Audition dates and audition application forms are available through the music department web site: gmu.edu/departments/music.

A fundamentals of music test is given during the first week of classes to all students enrolled in MUSI 115 Theory I. Call the Department 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: sight singing, ear training, 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 PROGRAMS**

The PhD in music education and the doctor of musical arts degree require 60 credits beyond the master’s degree 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.

**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 (single or multiple instruments), music education, composition, conducting, and pedagogy and performance. The MM with a concentration in music education does not provide licensure to teach music in public or private schools.

**PhD in Music Education (pending SCHEV approval)**

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 (pending SCHEV approval)**

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. DMA graduates are qualified to teach music at the college or university level, as well as K–12.

**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: gmu.edu/departments/music

**Faculty**

James Gardner, Chair  

**Professors:** Camphouse, Carroll, Engebretson, J. Gardner (chair), Maiello, Miller, Monson (associate chair), Smith  

**Term professor:** Balakerskaia, Hearden, Johonnott, Lapple  

**Associate professors:** Billingham, T. Owens
Term associate professors: Casagrande, Ker-Hackleman, Rendler

Assistant professors: Bergman, Guessford, Nickens, Novak, Robinson

Adjunct Faculty: Beach, Beckwith, Behrend, Berkshire-Brown, Berger, Conlon, Crabill, East, Gerber, Haroutounian, Healey, Hughes, Kilkenny, McCarthy, M. Owens, Parrell, Rittenhouse, Roberts, Snitzler, Stephansky, Sternbach, Taylor, von Villas, Watters, Wenner

The bachelor of art (BA) in music 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 Department of Music before the scheduled audition date. Auditions are held approximately once per month. Audition dates and audition application forms are available through the music department web site: gmu.edu/departments/music.

A fundamentals of music test is given during the first week of classes to all students enrolled in MUSI 115 Theory I. Call the Department 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: sight singing, ear training, 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

Please see College of Visual and Performing Arts for college academic policies.

Degree Requirements

General Education (25-46 credits)

Foundation Requirements

- Quantitative reasoning (mathematics)* (3)
- Written Communication:
- ENGL 101 - Composition Credits: 3
ENGL 302 - Advanced Composition Credits: 3
Nonnative speakers of English with limited proficiency may substitute ENGL 100 for ENGL 101. Students must attain a minimum grade of C in ENGL 100 or 101, as well as in 302, to fulfill degree requirements.

Core Requirements

- Literature* (3)
- Natural science* (two classes; one must contain a lab) (7)
- Western civilization (3)
- Social or behavioral science* (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

Note:

* See beginning of CVPA chapter for foreign language requirement.

Music Major (57 credits)

Musicianship (28 credits)

- MUSI 115 - Theory I Credits: 3
- MUSI 116 - Theory II Credits: 3
- MUSI 215 - Theory III Credits: 3
- MUSI 216 - Form and Analysis Credits: 3
- MUSI 113 - Sight Singing and Ear Training I Credits: 2
- MUSI 114 - Sight Singing and Ear Training II Credits: 2

(Pianists substitute MUSI 371 and 372 for MUSI 171 and 172)
- MUSI 171 - Keyboard Skills I Credits: 1
- MUSI 172 - Keyboard Skills II Credits: 1
- MUSI 273 - Keyboard Skills III Credits: 1
- MUSI 431 - Music History in Society III Credits: 3 (Meets university general education global understanding requirement)

Music History Courses:
MUSI 331 and 332 Music History in Society I and II
or MUSI 331 and 432 I and IV
or MUSI 332 and 432 II and IV (6 credits)

Performance and Music Electives (29 credits)

- Applied music (PMI) (8)
- Large ensemble (Transfer students must earn at least 2 credits at Mason) (4)
- Additional ensembles (Large or small; meets university general education arts requirement) (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 351 - Keyboard Pedagogy Credits: 3
  or
- MUSI 352 - Vocal Pedagogy and Lab Credits: 3
  or
- MUSI 353 - Instrumental Pedagogy and Literature Credits: 3
- MUSI 395 - Teaching Internship Credits: 1-4
- MUSI 490 - Musical Communication in Context Credits: 3 (Meets university general education synthesis requirement)
- MUSI 300 - Recital Attendance Credits: 0 (five semesters)

Note

MUSI 395 must be taken for 2 credits

Electives (17-38 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: gmu.edu/departments/music

Faculty

James Gardner, Chair
Professors: Camphouse, Carroll, Engebretson, J. Gardner (chair), Maiello, Miller, Monson (associate chair), Smith

Term professor: Balakerskaia, Hearden, Johonnott, Lapple

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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 Department of Music before the scheduled audition date.

Auditions are held approximately once per month. Audition dates and audition application forms are available through the music department web site: gmu.edu/departments/music

A fundamentals of music test is given during the first week of classes to all students enrolled in MUSI 115 Theory I. Call the Department 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: sight singing, ear training, and keyboard skills.

One hundred twenty 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

▲ Concentration in Composition (CPO):

General Education (21 credits)

Foundation Requirements

- Analytical reasoning (mathematics)* (3)
- Written Communication:
- ENGL 101 - Composition Credits: 3
- ENGL 302 - Advanced Composition Credits: 3
  Nonnative speakers of English with limited proficiency may substitute ENGL 100 for ENGL 101. Students must attain a minimum grade of C in ENGL 100 or 101, as well as 302, to fulfill degree requirements.

Core Requirements

- Literature* (3)
- Natural science* (3)
- Western civilization (3)
- Social or behavioral science* (3)

Notes:

*Also have significant elective choices as per general education listing.

Remaining general education requirements are fulfilled with major course work.

Music Core Courses (72 credits)

- MUSI 485 M3E or Healing Arts Ensemble (4)
  (four semesters)
- MUSI 251 - The Art of Teaching Music Credits: 3 (general education communications)
- 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 324 - Junior Recital Credits: 1
- MUSI 424 - Senior Recital Credits: 1
- MUSI 491 - Musical Communication in Performance Credits: 1 (Synthesis)
- MUSI 113 - Sight Singing and Ear Training I Credits: 2
- MUSI 114 - Sight Singing and Ear Training II Credits: 2
- MUSI 213 - Sight Singing and Ear Training III Credits: 2
- MUSI 115 - Theory I Credits: 3
- MUSI 116 - Theory II Credits: 3
MUSI 215 - Theory III Credits: 3
MUSI 216 - Form and Analysis Credits: 3
MUSI 273 - Keyboard Skills III Credits: 1
MUSI 319 - Class Composition and Arranging Credits: 3
MUSI 379 - Introduction to Jazz Improvisation Credits: 1
MUSI 419 - Orchestration Credits: 3
MUSI 331 - Music History in Society I Credits: 3
MUSI 332 - Music History in Society II Credits: 3
MUSI 432 - Music History in Society IV Credits: 3
MUSI 361 - Class Strings: Violin, Viola, Cello, and Bass Credits: 1
MUSI 363 - Class Woodwinds: Flute and Clarinet 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 454 - Jazz Arranging Credits: 3
or
MUSI 485 - Chamber Ensembles Credits: 1
MUSI 300 - Recital Attendance Credits: 0 (five semesters)
MUSI 248 - PMI Composition Credits: 2
MUSI 448 - PMI Composition Credits: 2-3 (four semesters)

Note:

MUSI 448 must be taken for four semesters for a total of 12 credits
MUSI 485 option must be taken for 3 credits

Emphasis Requirement (complete one) (27 credits)

Composition: Brass emphasis

- MUSI 245 Applied Music: Brass (three semesters) (6)
- MUSI 380, MUSI 383, MUSI 387, or MUSI 389 Ensemble (1)
- MUSI 380, MUSI 383, MUSI 387, or MUSI 389 Ensemble (three semesters) (meets general education fine arts requirement) (3)
- MUSI 171 and MUSI 172 Keyboard Skills I and II (2)
- MUSI 353 Instrumental Pedagogy and Literature (3)
- MUSI 391 and MUSI 396 Instrumental Conducting I and II (4)
- General Electives (8)
Composition: Guitar emphasis

- MUSI 246 Applied Music: String (three semesters) (6)
- MUSI 381, MUSI 384, MUSI 385, or MUSI 389 Ensemble (1)
- MUSI 381, MUSI 384, MUSI 385, or MUSI 389 Ensemble (three semesters) (meets general education fine arts requirement) (3)
- MUSI 171 and MUSI 172 Keyboard Skills I and II (2)
- MUSI 353 Instrumental Pedagogy and Literature (3)
- MUSI 391 and MUSI 396 Conducting I and II (4)
- General Electives (8)

Composition: Keyboard emphasis

- MUSI 242 Applied Music: Keyboard (three semesters) (6)
- MUSI 381, MUSI 384, or MUSI 385 Chorus (1)
- MUSI 381, MUSI 384, or MUSI 385 Chorus (three semesters) (meets general education fine arts requirement) (3)
- MUSI 351 Keyboard Pedagogy (3)
- MUSI 371 and MUSI 372 Accompanying I and II (2)
- MUSI 391 and MUSI 396 Conducting I and II (4)
- General electives (8)

Composition: Percussion emphasis

- MUSI 247 Applied Music: Percussion (three semesters) (6)
- MUSI 380, MUSI 383, MUSI 387, or MUSI 389 Ensemble (1)
- MUSI 380, MUSI 383, MUSI 387, or MUSI 389 Ensemble (three semesters) (meets general education fine arts requirement) (3)
- MUSI 171 and MUSI 172 Keyboard Skills I and II (2)
- MUSI 353 Instrumental Pedagogy and Literature (3)
- MUSI 391 and MUSI 396 Conducting I and II (4)
- General electives (8)

Composition: String emphasis

- MUSI 246 Applied Music: String (three semesters) (6)
- MUSI 387 Ensemble (1)
- MUSI 387 Ensemble (three semesters) (meets general education fine arts requirement) (3)
- MUSI 171 and MUSI 172 Keyboard Skills I and II (2)
- MUSI 353 Instrumental Pedagogy and Literature (3)
- MUSI 391 and MUSI 396 Conducting I and II (4)
- General electives (8)

Composition: Voice emphasis

- MUSI 243 Applied Music: Voice (three semesters) (6)
- MUSI 381, MUSI 384, or MUSI 385 Chorus (1)
- MUSI 381, MUSI 384, or MUSI 385 Chorus (three semesters) (meets general education fine arts requirement) (3)
• MUSI 171 and MUSI 172 Keyboard Skills I and II (2)
• MUSI 352 Vocal Pedagogy (3)
• MUSI 391 and MUSI 396 Choral Conducting I and II (4)
• General electives (8)

Composition: Woodwind emphasis

• MUSI 244 Applied Music: Woodwind (three semesters) (6)
• MUSI 380, MUSI 383, MUSI 387, or MUSI 389 Ensemble (1)
• MUSI 380, MUSI 383, MUSI 387, or MUSI 389 Ensemble (three semesters) (meets general education fine arts requirement) (3)
• MUSI 171 and MUSI 172 Keyboard Skills I and II (2)
• MUSI 353 Instrumental Pedagogy and Literature (3)
• MUSI 391 and MUSI 396 Choral Conducting I and II (4)
• General electives (8)

Total: 120 credits

▲ Concentration in Jazz (JACZ):

General Education (21 credits)

Foundation Requirements

• Quantitative reasoning (mathematics)* (3)
• Written Communication:
• ENGL 101 - Composition Credits: 3
• ENGL 302 - Advanced Composition Credits: 3
  Nonnative speakers of English with limited proficiency may substitute ENGL 100 for ENGL 101. Students must attain a minimum grade of C in ENGL 100 or 101, as well as 302, to fulfill degree requirements.

Core Requirements

• Literature* (3)
• Natural science* (3)
• Western civilization (3)
• Social or behavioral science* (3)

Notes:

*Also have significant elective choices as per general education listing.

Remaining general education requirements are fulfilled with major course work.
Music Core Courses (74 credits)

- MUSI 251 - The Art of Teaching Music Credits: 3 (general education communications)
- 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 389 - Jazz Ensemble Credits: 1 (three semesters) (general education fine arts)
- MUSI 324 - Junior Recital Credits: 1
- MUSI 424 - Senior Recital Credits: 1
- MUSI 491 - Musical Communication in Performance Credits: 1 (Synthesis)
- MUSI 389 - Jazz Ensemble (5 semesters)
- MUSI 485 - Chamber Ensembles Credits: 1
- MUSI 300 - Recital Attendance Credits: 0 (5 semesters)
- MUSI 113 - Sight Singing and Ear Training I Credits: 2
- MUSI 114 - Sight Singing and Ear Training II Credits: 2
- MUSI 213 - Sight Singing and Ear Training III Credits: 2
- MUSI 115 - Theory I Credits: 3
- MUSI 116 - Theory II Credits: 3
- MUSI 215 - Theory III Credits: 3
- MUSI 216 - Form and Analysis Credits: 3
- MUSI 273 - Keyboard Skills III Credits: 1
- MUSI 319 - Class Composition and Arranging Credits: 3
- MUSI 379 - Introduction to Jazz Improvisation Credits: 1
- MUSI 454 - Jazz Arranging Credits: 3
- MUSI 107 - The Development of JazzCredits: 3
- MUSI 311 - Jazz Studies Credits: 3
- MUSI 331 - Music History in Society I Credits: 3
- MUSI 332 - Music History in Society II Credits: 3
- MUSI 432 - Music History in Society IV Credits: 3
- MUSI 492J - Selected Topics in Music Credits: 1-3 (Topics in Jazz Studies 3 credits)
- MUSI 391 - Conducting I Credits: 2
- MUSI 450 - Jazz Improvisation I Credits: 2
- MUSI 452 - Jazz Improvisation II Credits: 2

Note

Students concentrating in Jazz Studies must take MUSI 389 Jazz Ensemble for a total of 8 credits

Emphasis Requirement (complete one) (25 credits)

Jazz: Brass emphasis

- MUSI 245 Applied Music (four semesters) (8)
- MUSI 445 Applied Music (four semesters) (12)
- MUSI 171 and MUSI 172 Keyboard Skills I and II (2)
- General electives (3)
Jazz: Guitar emphasis

- MUSI 246 Applied Music (four semesters) (8)
- MUSI 446 Applied Music (four semesters) (12)
- MUSI 171 and MUSI 172 Keyboard Skills I and II (2)
- General electives (3)

Jazz: Keyboard emphasis

- MUSI 242 Applied Music (four semesters) (8)
- MUSI 442 Applied Music (four semesters) (12)
- MUSI 371 and MUSI 372 Accompanying I–II (2)
- General electives (3)

Jazz: Percussion emphasis

- MUSI 247 Applied Music (four semesters) (8)
- MUSI 447 Applied Music (four semesters) (12)
- MUSI 171 and MUSI 172 Keyboard Skills I and II (2)
- General electives (3)

Jazz: Woodwind emphasis

- MUSI 244 Applied Music (four semesters) (8)
- MUSI 444 Applied Music (four semesters) (12)
- MUSI 171 and MUSI 172 Keyboard Skills I and II (2)
- General electives (3)

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 must be formally accepted into the music education concentration by the department’s Music Teacher Education Committee. They must have earned 45 to 60 credits and completed Sight Singing and Ear Training 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 ENGL 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 music and professional education courses needed for graduation.
• Successfully pass sight singing, ear training, 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 internship or student teaching. 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.

General Education (21 credits)

Foundation Requirements

• Quantitative reasoning (mathematics)* (3)
• ENGL 101 - Composition Credits: 3
• ENGL 302 - Advanced Composition Credits: 3
  Nonnative speakers of English with limited proficiency may substitute ENGL 100 for ENGL 101. Students must attain a minimum grade of C in ENGL 100 or 101, as well as 302, to fulfill degree requirements.

Core Requirements

• Literature* (3)
• Natural science* (3)
• Western civilization (3)
• Social or behavioral science* (3)

Notes:

*Also have significant elective choices as per general education listing.

Remaining general education requirements are fulfilled with major course work.

Music Core Courses (59 credits)

• MUSI 251 - The Art of Teaching Music Credits: 3 (general education communications)
• 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 495 - Internship in Music Education: Student Teaching Credits: 6 (general education synthesis)
• MUSI 323 - Music Education Recital Credits: 0
• MUSI 113 - Sight Singing and Ear Training I Credits: 2
• MUSI 114 - Sight Singing and Ear Training II Credits: 2
• MUSI 213 - Sight Singing and Ear Training III Credits: 2
• MUSI 115 - Theory I Credits: 3
• MUSI 116 - Theory II Credits: 3
• MUSI 215 - Theory III Credits: 3
• MUSI 216 - Form and Analysis Credits: 3
• MUSI 273 - Keyboard Skills III Credits: 1
• 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 432 - Music History in Society IV Credits: 3
• MUSI 300 - Recital Attendance Credits: 0
  (five semesters)
• MUSI 361 - Class Strings: Violin, Viola, Cello, and Bass Credits: 1
• MUSI 366 - Class Percussion Credits: 1
• MUSI 393 - Music Administration and Management Credits: 2
• 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 (complete one) (40 credits)**

**Music Education: Brass emphasis**

• MUSI 245 Applied Music (four semesters) (8)
• MUSI 445 Applied Music (three semesters) (6)
• MUSI 380, MUSI 383, MUSI 387, and/or MUSI 389 Ensemble (four semesters) (4)
• MUSI 380, MUSI 383, MUSI 387, and/or MUSI 389 Ensemble (three semesters) (meets general education fine arts requirement) (3)
• MUSI 171 and MUSI 172 Keyboard Skills (2)
• MUSI 363 and MUSI 364 Class Woodwinds I and II (2)
• MUSI 365 and MUSI 369 Class Brass I and II (2)
• MUSI 367 Class Guitar (1)
• MUSI 368 Class Voice (1)
• MUSI 391 and MUSI 396 Instrumental Conducting I and II (4)
• MUSI 464 and MUSI 466 Instrumental Methods I–II (6)
• General Elective (1)

**Music Education: Guitar emphasis**

• MUSI 246 Applied Music (four semesters) (8)
• MUSI 446 Applied Music (three semesters) (6)
• MUSI 381, MUSI 384, MUSI 385, or MUSI 389 Ensemble (four semesters) (4)
• MUSI 381, MUSI 384, MUSI 385, or MUSI 389 Ensemble (three semesters) (meets general education fine arts requirement) (3)
• MUSI 171 and MUSI 172 Keyboard Skills (2)
• MUSI 363 and MUSI 364 Class Woodwinds I and II (2)
• MUSI 365 and MUSI 369 Class Brass I and II (2)
• MUSI 367 Class Guitar (1)
• MUSI 368 Class Voice (1)
• MUSI 391 and MUSI 396 Conducting I and II (4)
• MUSI 464 or MUSI 467 Instrumental Methods I or II (3)
• MUSI 466 Instrumental Methods II (3)
• General Elective (1)

Music Education: Keyboard emphasis

• MUSI 242 Applied Music (four semesters) (8)
• MUSI 442 Applied Music (three semesters) (6)
• MUSI 223 Applied Music (Voice, two semesters) (2)
• MUSI 381, MUSI 384, and/or MUSI 385 Ensemble: Chorus (four semesters) (4)
• MUSI 381, MUSI 384, and/or MUSI 385 Ensemble: Chorus (three semesters) (meets general education fine arts requirement) (3)
• MUSI 352 Vocal Pedagogy (3)
• MUSI 363, MUSI 364, MUSI 365, or MUSI 369 Class Instruments (1)
• MUSI 367 Class Guitar (1)
• MUSI 371, MUSI 372 Accompanying I and II (2)
• MUSI 391, MUSI 396 Choral Conducting I and II (4)
• MUSI 461 Teaching General Music (3)
• MUSI 463 Teaching Vocal Secondary Music (3)

Music Education: Percussion emphasis

• MUSI 247 Applied Music (four semesters) (8)
• MUSI 447 Applied Music (three semesters) (6)
• MUSI 380, MUSI 383, MUSI 387, and/or MUSI 389 Ensemble (four semesters) (4)
• MUSI 380, MUSI 383, MUSI 387, and/or MUSI 389 Ensemble (3 semesters) (meets general education fine arts requirement) (3)
• MUSI 171 and MUSI 172 Keyboard Skills (2)
• MUSI 363 and MUSI 364 Class Woodwinds I and II (2)
• MUSI 365 and MUSI 369 Class Brass I and II (2)
• MUSI 367 Class Guitar (1)
• MUSI 368 Class Voice (1)
• MUSI 391 and MUSI 396 Instrumental Conducting I and II (4)
• MUSI 464 and MUSI 466 Instrumental Methods I–II (6)
• General Elective (1)

Music Education: String emphasis

• MUSI 246 Applied Music (four semesters) (8)
• MUSI 446 Applied Music (three semesters) (6)
• MUSI 387 Ensemble: Orchestra (four semesters) (4)
• MUSI 387 Ensemble: Orchestra (three semesters) (meets general education fine arts requirement) (3)
- MUSI 171 and MUSI 172 Keyboard Skills (2)
- MUSI 363 and MUSI 364 Class Woodwinds I and II (2)
- MUSI 365 and MUSI 369 Class Brass I and II (2)
- MUSI 367 Class Guitar (1)
- MUSI 368 Class Voice (1)
- MUSI 391 and MUSI 396 Instrumental Conducting I and II (4)
- MUSI 467 Orchestral Methods (3)
- MUSI 466 Instrumental Methods II (3)
- General Elective (1)

**Music Education: Voice emphasis**

- MUSI 243 Applied Music (four semesters) (8)
- MUSI 443 Applied Music (three semesters) (6)
- MUSI 222 Applied Music (Piano, two semesters) (2)
- MUSI 381, MUSI 384, and/or MUSI 385 Ensemble: Chorus (four semesters) (4)
- MUSI 381, MUSI 384, and/or MUSI 385 Ensemble: Chorus (three semesters) (meets general education fine arts requirement) (3)
- MUSI 171 and MUSI 172 Keyboard Skills (2)
- MUSI 352 Vocal Pedagogy (3)
- MUSI 363, MUSI 364, MUSI 365, or MUSI 369 Class Instruments (1)
- MUSI 367 Class Guitar (1)
- MUSI 391 and MUSI 396 Choral Conducting I and II (4)
- MUSI 461 Teaching General Music (3)
- MUSI 463 Teaching Vocal Secondary Music (3)

**Music Education: Woodwind emphasis**

- MUSI 244 Applied Music (four semesters) (8)
- MUSI 444 Applied Music (three semesters) (6)
- MUSI 380, MUSI 383, MUSI 387, and/or MUSI 389 Ensemble (four semesters) (4)
- MUSI 380, MUSI 383, MUSI 387, and/or MUSI 389 Ensemble (three semesters) (meets general education fine arts requirement) (3)
- MUSI 171 and MUSI 172 Keyboard Skills (2)
- MUSI 363 and MUSI 364 Class Woodwinds I and II (2)
- MUSI 365 and MUSI 369 Class Brass I and II (2)
- MUSI 367 Class Guitar (1)
- MUSI 368 Class Voice (1)
- MUSI 391 and MUSI 396 Instrumental Conducting I and II (4)
- MUSI 464 and MUSI 466 Instrumental Methods I and II (6)
- General Elective (1)

**Total: 120 credits**

▲ **Concentration in Performance (PFM):**
General Education (21 credits)

Foundation Requirements

- Quantitative reasoning (mathematics)* (3)
- ENGL 101 - Composition Credits: 3
- ENGL 302 - Advanced Composition Credits: 3
  Nonnative speakers of English with limited proficiency may substitute ENGL 100 for ENGL 101. Students must attain a minimum grade of C in ENGL 100 or 101, as well as 302, to fulfill degree requirements.

Core Requirements

- Literature* (3)
- Natural science* (3)
- Western civilization (3)
- Social or behavioral science* (3)

Notes:

*Also have significant elective choices as per general education listing.

Remaining general education requirements are fulfilled with major course work.

Music Core Courses (43 credits)

- MUSI 251 - The Art of Teaching Music Credits: 3 (general education communications)
- 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 324 - Junior Recital Credits: 1
- MUSI 424 - Senior Recital Credits: 1
- MUSI 491 - Musical Communication in Performance Credits: 1 (Synthesis)
- MUSI 113 - Sight Singing and Ear Training I Credits: 2
- MUSI 114 - Sight Singing and Ear Training II Credits: 2
- MUSI 213 - Sight Singing and Ear Training III Credits: 2
- MUSI 115 - Theory I Credits: 3
- MUSI 116 - Theory II Credits: 3
- MUSI 215 - Theory III Credits: 3
- MUSI 216 - Form and Analysis Credits: 3
- MUSI 273 - Keyboard Skills III Credits: 1
- 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 432 - Music History in Society IV Credits: 3
- MUSI 300 - Recital Attendance Credits: 0 (five semesters)
Emphasis Requirement (complete one) (56 credits)

Performance: Brass emphasis

- MUSI 225 Applied Music (four semesters) (8)
- MUSI 445 Applied Music (four semesters) (12)
- MUSI 380, MUSI 383, MUSI 387, and/or MUSI 389 Ensemble (5)
- MUSI 380, MUSI 383, MUSI 387, and/or MUSI 389 Ensemble (meets general education fine arts requirement) (3)
- MUSI 171 and MUSI 172 Keyboard Skills I and II (2)
- MUSI 353 Instrumental Pedagogy and Literature (3)
- MUSI 379 Improvisation (1)
- MUSI 391 and MUSI 396 Instrumental Conducting I and II (4)
- MUSI 395 Teaching Internships (two semesters) (4)
- MUSI 419 Orchestration (3)
- General Electives (11)

Performance: Guitar emphasis

- MUSI 226 Applied Music (four semesters) (8)
- MUSI 446 Applied Music (four semesters) (12)
- MUSI 381, MUSI 384, MUSI 385, and/or MUSI 389 Ensemble (5)
- MUSI 381, MUSI 384, MUSI 385, and/or MUSI 389 Ensemble (meets general education fine arts requirement) (3)
- MUSI 171 and MUSI 172 Keyboard Skills I and II (2)
- MUSI 353 Instrumental Pedagogy and Literature (3)
- MUSI 379 Improvisation (1)
- MUSI 391 and MUSI 396 Instrumental Conducting I and II (4)
- MUSI 395 Teaching Internships (two semesters) (4)
- MUSI 419 Orchestration (3)
- General Electives (11)

Performance: Keyboard emphasis

- MUSI 242 Applied Music (four semesters) (8)
- MUSI 442 Applied Music (four semesters) (12)
- MUSI 381, MUSI 384, and/or MUSI 385 Ensemble (5)
- MUSI 381, MUSI 384, and/or MUSI 385 Ensemble (meets general education fine arts requirement) (3)
- MUSI 351 Keyboard Pedagogy (3)
- MUSI 371 and MUSI 372 Techniques of Accompanying I and II (2)
- MUSI 373 Adv Accompanying and Musicianship Skills (3)
- MUSI 382 or MUSI 485 Piano Chamber Ensemble (1)
- MUSI 379 Improvisation (1)
- MUSI 391 Conducting I (2)
- MUSI 395 Teaching Internship (2)
- MUSI 492H Keyboard Literature (3)
- General Electives (11)
Performance: Percussion emphasis

- MUSI 227 Applied Music (four semesters) (8)
- MUSI 447 Applied Music (four semesters) (12)
- MUSI 380, MUSI 383, MUSI 387, and/or MUSI 389 Ensemble (5)
- MUSI 380, MUSI 383, MUSI 387, and/or MUSI 389 Ensemble (meets general education fine arts requirement) (3)
- MUSI 171 and MUSI 172 Keyboard Skills I and II (2)
- MUSI 353 Instrumental Pedagogy and Literature (3)
- MUSI 379 Improvisation (1)
- MUSI 391 and MUSI 396 Instrumental Conducting I and II (4)
- MUSI 395 Teaching Internships (two semesters) (4)
- MUSI 419 Orchestration (3)
- General Electives (11)

Performance: String emphasis

- MUSI 226 Applied Music (four semesters) (8)
- MUSI 446 Applied Music (four semesters) (12)
- MUSI 387 Ensemble (5)
- MUSI 387 Ensemble (meets general education fine arts requirement) (3)
- MUSI 171 and MUSI 172 Keyboard Skills I and II (2)
- MUSI 353 Instrumental Pedagogy and Literature (3)
- MUSI 379 Improvisation (1)
- MUSI 391 and MUSI 396 Instrumental Conducting I and II (4)
- MUSI 395 Teaching Internships (two semesters) (4)
- MUSI 419 Orchestration (3)
- General Electives (11)

Performance: Voice emphasis

- MUSI 223 Applied Music (four semesters) (8)
- MUSI 443 Applied Music (four semesters) (12)
- MUSI 381, MUSI 384, and/or MUSI 385 Ensemble (5)
- MUSI 381, MUSI 384, and/or MUSI 385 Ensemble (meets general education fine arts requirement) (3)
- MUSI 171 and MUSI 172 Keyboard Skills I and II (2)
- MUSI 325 and MUSI 326 Performance Seminar I and II (4)
- MUSI 341 and MUSI 342 Diction for Singers I and II (4)
- MUSI 352 Vocal Pedagogy and Lab (3)
- MUSI 388 Fundamental Techniques of Stagecraft (2)
- MUSI 391 and MUSI 396 Choral Conducting I and II (4)
- Foreign Language: French, German, and/or Italian (9)

Performance: Woodwind emphasis

- MUSI 224 Applied Music (four semesters) (8)
- MUSI 444 Applied Music (four semesters) (12)
- MUSI 380, MUSI 383, MUSI 387, and/or MUSI 389 Ensemble (5)
• MUSI 380, MUSI 383, MUSI 387, and/or MUSI 389 Ensemble (meets general education fine arts requirement) (3)
• MUSI 171 and MUSI 172 Keyboard Skills I and II (2)
• MUSI 353 Instrumental Pedagogy and Literature (3)
• MUSI 379 Improvisation (1)
• MUSI 391 and MUSI 396 Instrumental Conducting I and II (4)
• MUSI 395 Teaching Internships (two semesters) (4)
• MUSI 419 Orchestration (3)
• General Electives (11)

Total: 120 credits

Undergraduate Interdisciplinary Minor

World Music Minor

Banner Code: WMUS

Performing Arts Building, Room A417
Phone: 703-993-1380
Web: gmu.edu/departments/music

Faculty

Carroll, Lepore, 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 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

One of the following two courses (1 credits):

- Applied Music (PMI)
  or
- Ensembles (Selection of private music instruction 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 (PMI) (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
- ENGL 333 - Folklore of the Americas 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.

Undergraduate Minor

Jazz Studies Minor

Banner Code: JAZZ
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. Jazz studies minors 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**

- Applied Music (PMI) (2)
- MUSI 107 - The Development of Jazz Credits: 3
- MUSI 113 - Sight Singing and Ear Training I Credits: 2
- 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
- MUSI 485 - Chamber Ensembles Credits: 1
- MUSI 379 - Introduction to Jazz Improvisation Credits: 1

**Note:**

Jazz studies minors must take MUSI 485 for 3 credits

*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**

**Music and Technology Minor**

**Banner Code: MUTC**

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 315 - Music Technology Credits: 3

Applied Music and Ensemble (3 credits)

- Applied Music (PMI) or Class Voice, Guitar, or Keyboard (1-2 credits)
- MUSI 38X or 485 (Ensemble) (1-2 credits)

2 Semesters of (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: gmu.edu/departments/music

All music minors must pass a music audition. Music minors 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

- Applied Music (PMI) (6)
- Ensembles (3)
- MUSI 101 - Introduction to Classical Music Credits: 3
- MUSI 113 - Sight Singing and Ear Training I Credits: 2
- 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)*

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: gmu.edu/departments/music

Faculty

James Gardner, Chair

Professors: Camphouse, Carroll, Engebretson, J. Gardner (chair), Maiello, Miller, Monson (associate chair), Smith

Term professor: Balakerskaia, Hearden, Johonnott, Lapple

Associate professors: Billingham, T. Owens

Term associate professors: Casagrande, Ker-Hackleman, Rendler

Assistant professors: Bergman, Guessford, Nickens, Novak, Robinson

Adjunct Faculty: Beach, Beckwith, Behrend, Berkshire-Brown, Berger, Conlon, Crabill, East, Gerber, Haroutounian, Healey, Hughes, Kilkenny, McCarthy, M. Owens, Parrell, Rittenhouse, Roberts, Snitzler, Stephansky, Sternbach, Taylor, von Villas, Watters, Wenner
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 (single or multiple instruments), music education, composition, conducting, and pedagogy and performance. 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 (single or multiple instruments)
- 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 and performance: audition in the primary applied teaching area is required. Applicants are expected to have large and small ensemble experience on the major instrument and presented a full solo recital or equivalent. All music teaching experience should be summarized.

Diagnostic Entrance Exam

All students are required to complete placement examinations in music theory, sight singing and ear training, 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, usually on the Saturday before the first day 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 department, 3 nonmusic graduate credits may be taken.

The student is admitted as concentrating in one of five areas: performance (single or multiple instrument/voice), music education, composition, conducting, or pedagogy/performance. 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) (11 credits):**

- Ensemble (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

**Additional Requirements**

▲ **Concentration in Composition (CPO):**

- 9 credits of MUSI 728 - PMI Composition Credits: 2-3 (repeatable)
- MUSI 613 - Graduate Orchestration Credits: 3
- MUSI 630 - Topics in Music History and Literature Credits: 3
- MUSI 790 - Graduate Recital Credits: 1

**Electives**

- Electives (3)

▲ **Concentration in Conducting (CDC):**

- 9 credits of MUSI 729 - PMI Conducting Credits: 2-3 (repeatable)
- MUSI 613 - Graduate Orchestration Credits: 3
- MUSI 610 - Topics in Music Theory Credits: 3
  or
- MUSI 630 - Topics in Music History and Literature Credits: 3
  or
- MUSI 712 - Composition for Conductors and Performers Credits: 3
Electives

- Electives (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. In most cases, each student accepted is offered an opportunity to gain conducting experience by serving as an assistant conductor of a university ensemble.

▲ Concentration in Music Education (MUE):

- 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

- MUSI 563 - Orff Schulwerk I Credits: 3
- MUSI 564 - Orff Schulwerk II Credits: 3
- MUSI 565 - Orff Schulwerk III Credits: 3
- MUSI Electives (4 credits)
  or
  9 advisor-approved credits 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
  - 3 credits of MUSI 660 - Topics in Music Education Credits: 1-6
  - Electives (4 credits)
    or
  - 6 credits of MUSI 799 - Thesis Credits: 1-6
  - MUSI Electives (7 credits)

▲ Concentration in Performance (PFM):

- MUSI 72X Graduate PMI (9)
- MUSI 610 - Topics in Music Theory Credits: 3
- MUSI 630 - Topics in Music History and Literature Credits: 3
- MUSI 790 - Graduate Recital Credits: 1
Electives

- Electives (3)

▲ Concentration in Pedagogy and Performance (PPFM):

- MUSI 72X Graduate PMI (6)
- 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
- MUSI 790 - Graduate Recital Credits: 1
- MUSI 573 - Accompanying and Musicianship III Credits: 3 (piano pedagogy only)

Pedagogy I—Take one of the following (3 credits):

- MUSI 551 - Keyboard Pedagogy I Credits: 3
- MUSI 552 - Vocal Pedagogy and Lab Credits: 3
- MUSI 553 - Instrumental Pedagogy and Literature Credits: 3

Electives

- Electives (0-3)

Master's Level Certificate

Instrumental Performance Artist Graduate Certificate

Banner Code: AR-CERG-ACIP

Performing Arts Building, Room A417
Phone: 703-993-1380
Web: gmu.edu/departments/music

Faculty

James Gardner, Chair

Professors: Camphouse, Carroll, Engebretson, J. Gardner (chair), Maiello, Miller, Monson (associate chair), Smith

Term professor: Balakerskaia, Hearden, Johonnott, Lapple

Associate professors: Billingham, T. Owens
Term associate professors: Casagrande, Ker-Hackleman, Rendler

Assistant professors: Bergman, Guessford, Nickens, Novak, Robinson

Adjunct Faculty: Beach, Beckwith, Behrend, Berkshire-Brown, Berger, Conlon, Crabill, East, Gerber, Haroutounian, Healey, Hughes, Kilkenny, McCarthy, M. Owens, Parrell, Rittenhouse, Roberts, Snitzler, Stephansky, Sternbach, Taylor, von Villas, Watters, Wenner

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.

Admission Requirements

- An artist certificate application and current résumé
- A bachelor’s degree in music or equivalent (as evaluated by the Music Department 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 PMI (over four semesters) (12)
- MUSI 592 - Topics in Music Credits: 1-6
- MUSI 790 - Graduate Recital Credits: 1

Note:

MUSI 592 must be taken for 2 credits
MUSI 790 (Graduate Recital) must be taken for 3 semesters with two solo recitals and one chamber recital

Support Studies in Literature and Pedagogy (8 credits)

- MUSI 630 - Topics in Music History and Literature 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

Electives

- Electives (5)

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

Note:

MUSI 682, MUSI 683, MUSI 685, MUSI 687 and MUSI 689 must be taken for a total of 6 credits

Electives

- Elective (1)

Total: 32 credits

Elective

- Elective (1)

Piano Performance Artist Certificate

Banner Code: AR-CERG-ACPP

Performing Arts Building, Room A417
Phone: 703-993-1380
Web: gmu.edu/departments/music
Faculty

James Gardner, Chair

Professors: Camphouse, Carroll, Engebretson, J. Gardner (chair), Maiello, Miller, Monson (associate chair), Smith

Term professor: Balakerskaia, Hearden, Johonnott, Lapple

Associate professors: Billingham, T. Owens

Term associate professors: Casagrande, Ker-Hackleman, Rendler

Assistant professors: Bergman, Guessford, Nickens, Novak, Robinson

Adjunct Faculty: Beach, Beckwith, Behrend, Berkshire-Brown, Berger, Conlon, Crabill, East, Gerber, Haroutounian, Healey, Hughes, Kilkenny, McCarthy, M. Owens, Parrell, Rittenhouse, Roberts, Snitzler, Stephansky, Sternbach, Taylor, von Villas, Watters, Wenner

CERG-ACPP

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.

Admission Requirements

- An artist certificate application and current résumé
- A bachelor’s degree in music or equivalent (as evaluated by the Music Department 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 PMI (over four semesters) (12)
- MUSI 592 - Topics in Music Credits: 1-6
- MUSI 790 - Graduate Recital Credits: 1

Note:

MUSI 592 must be taken for 2 credits

MUSI 790 (Graduate Recital) must be taken for 3 semesters with two solo recitals and one chamber recital
Support Studies in Literature and Pedagogy (8 credits)

- MUSI 630 - Topics in Music History and Literature 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

Elective

- Electives (5)

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

Note:

MUSI 682, MUSI 683, MUSI 685, MUSI 687 and MUSI 689 must be taken for a total of 6 credits

Elective

- Elective (1)

Total: 32 credits

Vocal Performance Artist Graduate Certificate
Faculty

James Gardner, Chair

Professors: Camphouse, Carroll, Engebretson, J. Gardner (chair), Maiello, Miller, Monson (associate chair), Smith

Term professor: Balakerskaia, Hearden, Johonnott, Lapple

Associate professors: Billingham, T. Owens

Term associate professors: Casagrande, Ker-Hackleman, Rendler

Assistant professors: Bergman, Guessford, Nickens, Novak, Robinson

Adjunct Faculty: Beach, Beckwith, Behrend, Berkshire-Brown, Berger, Conlon, Crabill, East, Gerber, Haroutounian, Healey, Hughes, Kilkenny, McCarthy, M. Owens, Parrell, Rittenhouse, Roberts, Snitzler, Stephansky, Sternbach, Taylor, von Villas, Watters, Wenner

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.

Admission Requirements

- An artist certificate application and current résumé
- A bachelor’s degree in music or equivalent (as evaluated by the Music Department 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)

- MUSI 723 - PMI Voice Credits: 2-3
- 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

Note:

MUSI 723 must be taken for 12 credits
MUSI 592 must be taken for 4 credits

Support Studies in Ensemble Performance plus Electives (12 credits)

• MUSI 685 - Graduate Chamber Ensemble Credits: 1
• MUSI 688 - Opera and Musical Theater Ensemble Credits: 3
• MUSI 690 - Graduate Lecture Recital Credits: 1-3
• MUSI 790 - Graduate Recital Credits: 1

Note:

MUSI 685 and MUSI 688 must be taken for a total of 9 credits

Elective

• Elective (1)

Total: 32 credits

Doctoral Degree

Music Education, PhD (pending SCHEV Approval)

Banner Code: AR-PHD-MME

Performing Arts Building, Room A417
Phone: 703-993-1380
Web: gmu.edu/departments/music

Faculty

James Gardner, Chair

Professors: Camphouse, Carroll, Engebretson, J. Gardner (chair), Maiello, Miller, Monson (associate chair), Smith

Term professor: Balakerskaia, Hearden, Johonnott, Lapple

Associate professors: Billingham, T. Owens
Term associate professors: Casagrande, Ker-Hackleman, Rendler

Assistant professors: Bergman, Guessford, Nickens, Novak, Robinson

Adjunct Faculty: Beach, Beckwith, Behrend, Berkshire-Brown, Berger, Conlon, Crabill, East, Gerber, Haroutounian, Healey, Hughes, Kilkenny, McCarthy, M. Owens, Parrell, Rittenhouse, Roberts, Snitzler, Stephansky, Sternbach, Taylor, von Villas, Watters, Wenner

The PhD in music education and the doctor of musical arts degree require 60 credits 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.

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 sight singing, ear-training, 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.

Academic Progress

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.

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. 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.

**Faculty Committee**

During the first semester of study, the college’s director 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 Department of Music may be part of the committee; if not, he or she will serve ex officio. 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.

**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 director of graduate studies, and the chair of the Department 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 Department 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 chair of the Department 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.

**Academic Policies**

Please see College of Visual and Performing Arts for college academic policies.

**Degree Requirements (60 credits)**

- Research Courses (advisor-approved CEHD) (9)
- MUSI 860 - Doctoral Seminar in Music Education Credits: 3
- MUSI 660 - Topics in Music Education Credits: 1-6
  or
- MUSI 880 - Doctoral Major Ensemble Credits: 1
- MUSI 610 - Topics in Music Theory Credits: 3
- MUSI 710 - Advanced Topics in Music Theory Credits: 3
- 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
- MUSI 810 - Doctoral Seminar in Analysis Credits: 3
  or
- MUSI 830 - Doctoral Seminar in Music History Credits: 3
- MUSI 998 - Dissertation Proposal Credits: 1-3
- MUSI 999 - Dissertation Credits: 1-6

**Approved Electives**

- Approved Electives* (6)

**Note:**

MUSI 610 and/or MUSI 710 must be taken for 6 credits
MUSI 630/640/730 must be taken for 6 credits
MUSI 660 option must be taken for 3 credits
MUSI 860 must be taken for 12 credits
MUSI 880 must be taken for 3 credits
MUSI 998 must be taken for 3 credits
MUSI 999 must be taken for 9 credits

Note:

*Approved electives could be from music history, music literature, world music, music theory, conducting, music education, secondary PMI, ensemble (including chamber music), or relevant nonmusic courses.

Musical Arts, DMA (pending SCHEV Approval)

Banner Code: AR-DMA-MUAR

Performing Arts Building, Room A417
Phone: 703-993-1380
Web: gmu.edu/departments/music

Faculty

James Gardner, Chair

Professors: Camphouse, Carroll, Engebretson, J. Gardner (chair), Maiello, Miller, Monson (associate chair), Smith

Term professor: Balakerskaia, Hearden, Johonnott, Lapple

Associate professors: Billingham, T. Owens

Term associate professors: Casagrande, Ker-Hackleman, Rendler

Assistant professors: Bergman, Guessford, Nickens, Novak, Robinson

Adjunct Faculty: Beach, Beckwith, Behrend, Berkshire-Brown, Berger, Conlon, Crabill, East, Gerber, Haroutounian, Healey, Hughes, Kilkenny, McCarthy, M. Owens, Parrell, Rittenhouse, Roberts, Snitzler, Stephansky, Sternbach, Taylor, von Villas, Watters, Wenner

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. DMA graduates are qualified to teach music at the college or university level, as well as K–12.

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.

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 sight singing, ear-training, 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.

Academic Progress

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.

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. 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.

Faculty Committee

During the first semester of study, the college’s director 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 Department of Music may be part of the committee; if not, he or she will serve ex officio. 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.

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 director of graduate studies, and the chair of the Department 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 Department 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 chair of the Department 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.

Academic Policies

Please see College of Visual and Performing Arts for college academic policies.

Degree Requirements

▲ Concentration in Composition (60 credits):

- History or Theory Elective (600 level or above) (3)
- Approved Electives* (1)
- MUSI 828 - Doctoral Private Music Instruction Composition Credits: 2-3
- MUSI 614 - Music Theory Pedagogy Credits: 3
- MUSI 685 - Graduate Chamber Ensemble Credits: 1
- MUSI 880 - Doctoral Major Ensemble Credits: 1
- MUSI 890 - Doctoral Recital Credits: 1-2
- 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 640 - Topics in World Musics Credits: 3
- MUSI 730 - Advanced Topics in Music History Credits: 3
- MUSI 810 - Doctoral Seminar in Analysis Credits: 3
- MUSI 830 - Doctoral Seminar in Music History Credits: 3
- MUSI 998 - Dissertation Proposal Credits: 1-3
- MUSI 999 - Dissertation Credits: 1-6

Note:

MUSI 630/MUSI 640/MUSI 730 must be taken for 6 credits

MUSI 685 Graduate Chamber Ensemble must be taken for 4 credits

MUSI 810 must be taken for 6 credits

MUSI 828 must be taken for 15 credits

MUSI 890 must be taken for 2 credits

MUSI 998 must be taken for 1 credit

MUSI 999 must be taken for 12 credits

▲ Concentration in Conducting (60 credits):

- History or Theory Elective (600 level or above) (3)
- Approved Electives* (5)
- MUSI 829 - Doctoral Private Music Instruction Conducting Credits: 2-3
- MUSI 770 - Advanced Topics in Pedagogy Credits: 3
- MUSI 880 - Doctoral Major Ensemble Credits: 1
- MUSI 890 - Doctoral Recital Credits: 1-2
- MUSI 610 - Topics in Music Theory Credits: 3
  or
- MUSI 710 - Advanced Topics in Music Theory Credits: 3
  or
- MUSI 712 - Composition for Conductors and Performers Credits: 3
- MUSI 630 - Topics in Music History and Literature Credits: 3
- MUSI 730 - Advanced Topics in Music History Credits: 3
- MUSI 830 - Doctoral Seminar in Music History Credits: 3
- MUSI 810 - Doctoral Seminar in Analysis Credits: 3
- MUSI 998 - Dissertation Proposal Credits: 1-3
- MUSI 999 - Dissertation Credits: 1-6

Note:
MUSI 630 and/or 730 must be taken for a total of 6 credits

MUSI 829 must be taken for 15 credits

MUSI 880 must be taken for 4 credits

MUSI 890 must be taken for 2 credits

MUSI 998 must be taken for 1 credit

MUSI 999 must be taken for 12 credits

▲ Concentration in Performance (60 credits):

- MUSI 82X Doctoral Private Music Instruction (PMI) (15)
- History or Theory Elective (600 level or above) (3)
- Approved Electives* (3)
- MUSI 770 - Advanced Topics in Pedagogy Credits: 3
- MUSI 880 - Doctoral Major Ensemble Credits: 1
  and/or
- MUSI 720 - Advanced Topics in Applied Music Credits: 3
- MUSI 685 - Graduate Chamber Ensemble Credits: 1
- MUSI 890 - Doctoral Recital Credits: 1-2
- MUSI 610 - Topics in Music Theory Credits: 3
  or
- MUSI 710 - Advanced Topics in Music Theory Credits: 3
  or
- MUSI 712 - Composition for Conductors and Performers Credits: 3
- MUSI 630 - Topics in Music History and Literature Credits: 3
- MUSI 730 - Advanced Topics in Music History Credits: 3
- MUSI 830 - Doctoral Seminar in Music History Credits: 3
- MUSI 810 - Doctoral Seminar in Analysis Credits: 3
- MUSI 998 - Dissertation Proposal Credits: 1-3
- MUSI 999 - Dissertation Credits: 1-6

Note:

MUSI 880 and/or MUSI 720 must be taken for 4 credits

MUSI 685 and/or MUSI 720 must be taken for 2 credits

MUSI 890 must be taken for 2 credits

MUSI 630 and/or MUSI 730 must be taken for 6 credits

MUSI 998 must be taken for 1 credit

MUSI 999 must be taken for 12 credits

Note:
Approved electives could be from music history, music literature, world music, music theory, conducting, music education, secondary PMI, ensemble (including chamber music), or relevant nonmusic courses.

**Theater**

Performing Arts Building, Room A407  
Phone: 703-993-1120  
Web: gmu.edu/departments/theater

**Faculty**

Clayton Austin, Chair  
**Professors:** D’Andrea (Robinson professor), Davis  
**Associate professors:** Austin, Elston, Gero, Johnsen-Neshati, Kurtz, McDonald  
**Term associate professor:** Chew  
**Adjunct Faculty:** Cetron, Lechter, Lee, 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 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. 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 elect a course of study that includes classes in at least two of three areas: performance, design and technical theater, and 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 including foreign language. Students must earn a minimum 2.00 cumulative GPA in their major.

**Theater Concentrations**

Theater majors may apply to complete their degree in one of the following concentrations: Design and Technical Theater, Performance, Playwriting and Dramaturgy, or Theater Studies.

To apply for admission into a concentration a student must have:

- completed 45 credits including THR credits as specified in the concentration
- cumulative GPA minimum of 2.5
**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 351.

**Honors in Theatre**

Students wishing to pursue Honors in Theater should contact the department chair.

**Production Opportunities**

Participation in Theater Department productions with the GMU Players is expected of all declared majors. Up to 4 practicum credits, 1 credit per assignment can be awarded for satisfactory completion of performance and production assignments in the major, including faculty or guest-directed GMU Players main stage, studio, or Theater of the First Amendment (TFA) productions.

TFA, a professional theater in residence within CVPA, offers students the chance to work closely with professional artists. TFA productions regularly employ student assistants in stage management, directing, design, dramaturgy, technical crews, and production and company management. Students are eligible to audition for age-appropriate roles or understudy assignments in TFA productions and may participate in the Membership Candidate Program through the Actors’ Equity Association.

**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: gmu.edu/departments/theater

**Faculty**

Clayton Austin, Chair  

**Professors:** D'Andrea (Robinson professor), Davis  
**Associate professors:** Austin, Elston, Gero, Johnsen-Neshati, Kurtz, McDonald  
**Term associate professor:** Chew  
**Adjunct Faculty:** Cetron, Lechter, Lee, 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. 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 elect a course of study that includes classes in at least two of three areas: performance, design and technical theater, and 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 including foreign language. Students must earn a minimum 2.00 cumulative GPA in their major.

Theater Concentrations

Theater majors may apply to complete their degree in one of the following concentrations: Design and Technical Theater, Performance, Playwriting and Dramaturgy, or Theater Studies.

To apply for admission into a concentration a student must have:

- completed 45 credits including THR credits as specified in the concentration
- cumulative GPA minimum of 2.5

Course Work

The Theater Department offers all course work designated THR 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 seeking a BA in theater fulfill this requirement by successfully completing THR 350 or THR 351.

Honors in Theatre

Students wishing to pursue Honors in Theater should contact the department chair.

Production Opportunities

Participation in Theater Department productions with the GMU Players is expected of all declared majors. Up to 4 practicum credits, 1 credit per assignment can be awarded for satisfactory completion of performance and production assignments in the major, including faculty or guest-directed GMU Players main stage, studio, or Theater of the First Amendment (TFA) productions.

TFA, a professional theater in residence within CVPA, offers students the chance to work closely with professional artists. TFA productions regularly employ student assistants in stage management, directing, design, dramaturgy, technical crews, and production and company management. Students are eligible to audition for age-appropriate roles or understudy assignments in TFA productions and may participate in the Membership Candidate Program through the Actors’ Equity Association.
Academic Policies

Please see College of Visual and Performing Arts academic policies.

Degree Requirements

General Education (40 credits)

Foundation Requirements

- Oral communication (3)
- Information technology (3)

  Quantitative reasoning:
  - Either appropriate placement score on quantitative skills and one of
  - MATH 108 - Introductory Calculus with Business Applications
  - MATH 110 - Introductory Probability and Statistics
  - MATH 111 - Linear Mathematical Modeling
  - MATH 113 - Analytic Geometry and Calculus I
  - MATH 115 - Analytic Geometry and Calculus I (Honors)
  - MATH 125 - Discrete Mathematics I
    or
  - IT 250
    or
  - STAT 250 - Introductory Statistics I
    or
  - lower placement score requiring MATH 106.
- ENGL 101 - Composition Credits: 3
- ENGL 302 - Advanced Composition Credits: 3

Core Requirements

- Literature (3)
- Arts (outside the major) (students earning a concentration in Design and Technical Theater must take ARTH 101, 102, 200 or 201) (3)
- Natural science (including one laboratory science) (7)
- Western civilization (3)
- Global understanding (3)
- Social and behavioral sciences (3)
- Synthesis requirement (see concentration for specific requirement) (3)
Major (56-78 credits)

Foreign Language or Minor (0–21 credits)

See beginning of CVPA chapter for foreign language requirement.

Students may complete an academic minor 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) (3–4)
- THR 150 - Drama, Stage, and Society I Credits: 3
- THR 151 - Drama, Stage, and Society II Credits: 3
- 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 (THR 359 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

Practicum
Students must complete 1 assignment in each of the following areas to earn a total of 4 practicum credits.

THR 196 assignments include 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

- 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

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

This emphasis is designed for the serious student of acting 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 Fundamentals Credits: 3
- THR 301 - Voice and Speech for the Performer 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: 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

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.
Theater Studies

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 teaching. For specific teacher certification requirements, students are directed to the Office of Teacher Education.

- 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
Theater majors may apply to complete their degree in one of the following concentrations: Design and Technical Theater, Performance, Playwriting and Dramaturgy, or Theater Studies.

Theater majors are not required to complete a concentration to graduate with a Theater BA.

To apply for admission into a concentration, a student must have:

- completed 45 credits including THR credits as specified in the concentration
- cumulative GPA minimum of 2.5

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) (36 credits)**

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 495 - Senior Capstone Project Credits: 3
- THR 440 - Advanced Studies in Directing/Dramaturgy Credits: 3
  or
- THR 496 - Text in Production 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: 4
THR 434 - Advanced Lighting Design Credits: 3
THR 494 - Field Experience Credits: 1-6

▲ Concentration in Performance (PFM) (39 credits)

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

Prequisites to apply: THR 210, 310, 329, and 3 additional THR credits

Required Core Courses:

- THR 300 - Voice and Speech Fundamentals 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 for the Performer 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

▲ Concentration in Playwriting and Dramaturgy (PWD) (30 credits)

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

▲ Concentration in Theater Studies (THST) (33 credits)
This concentration is designed to provide the theater generalist with a thorough preparation for further study and work in directing, scholarship or teaching.

Synthesis fulfilled by THR 440 or THR 496

THR 494 requires 3 credits

Prerequisites to apply: THR 198 or 199, 150 or 151, 210 and 230

Required Core Courses:

- THR 494 - Field Experience Credits: 1-6
- THR 495 - Senior Capstone Project Credits: 3
- THR 440 - Advanced Studies in Directing/Dramaturgy Credits: 3
  or
- THR 496 - Text in Production 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 cr)

Electives

- Electives (2-24 credits)

Total: 120 credits

Undergraduate Minor

Theater Minor

Banner Code: THR

Performing Arts Building, Room A407
Phone: 703-993-1120
Web: gmu.edu/departments/theater

The theater minor consists of 18 credits in theater, selected in consultation with a faculty advisor and approved by the department chair.

University policy states that students must earn 8 distinct credits that are not used for their major toward their degree.
The Volgenau School of Information Technology and 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)
Civil, Environmental, and Infrastructure Engineering (CEIE)
Computer Science (CS)
Electrical and Computer Engineering (ECE)
Interdisciplinary Programs
Statistics (STAT)
Systems Engineering and Operations Research (SEOR)

The mission of the Volgenau School of IT & 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 Information Technology and 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 several degree programs that concentrate on important contemporary technological issues and needs. Bachelor’s degree programs are offered in the areas of applied computer science, civil and infrastructure engineering, computer engineering, computer science, electrical engineering, 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, computer engineering, computer forensics, computer science, electrical engineering, information security and assurance, information systems, operations research, software engineering, statistical science, systems engineering, and telecommunications. 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.

Undergraduate certificates are offered in applied statistics, information technology, postbachelor computer science, and operations research and engineering. For graduate students, certificate programs are offered in advanced network protocols for
telecommunications; architecture-based systems engineering; biometrics; e-commerce; command, control, communications, computing, and intelligence; intelligent agents; communications and networking; computational modeling; systems engineering of software intensive systems; federal statistics; biostatistics; information engineering; information security and assurance; military operations research; signal processing; software engineering; telecommunications forensics and security; networks, systems integration and testing; very-large-scale-integration (VLSI) design and manufacturing; civil infrastructure and security engineering; discovery, design, and innovation; computer networking; network technologies and applications; wireless communications; telecommunications systems modeling; data mining; database management; and web-based software engineering.

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, 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. The bachelor of individualized study (BIS) degree program may appeal to adult students who have completed a substantial portion of their studies at other institutions.

Bioengineering has been increasingly represented at the Volgenau School. New faculty members are working with other departments, schools, and institutes at Mason to provide a quality education to students interested in this rapidly growing field. The faculty at the Volgenau School hopes to work with numerous Washington-area organizations dedicated to health oriented research or clinical service.

Administration

Lloyd Griffiths, Dean
Daniel A. Menascé, Senior Associate Dean
E. Bernard White, Associate Dean for Undergraduate Studies
Sharon Caraballo, Assistant Dean for Academic Affairs
Jennifer Lamb, Assistant Dean for Development
Melinda Barnhart, Executive Director, Finance and Administration
Pete Farrell, Director, Business Development
Jonathan Goldman, Director, Computing Resources
Terri Mancini, Director, Sponsored Research Administration
Lisa Nolder, Director, Graduate Student Services
Nicole Sealey, Director, Graduate Admissions and Enrollment Management

Bachelor of Science Programs

The Volgenau School offers seven programs in its academic units. Policies regarding admission and degree requirements are provided in the department sections that follow.

<table>
<thead>
<tr>
<th>BS Degree</th>
<th>Department</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applied Computer Science</td>
<td>CS</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>
<tr>
<td>Computer Science</td>
<td>CS</td>
</tr>
<tr>
<td>Electrical 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

Freshmen who are undecided about their specific majors may select Volgenau School undeclared as their major. 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.

The requirements for the BIS degree can be found in the College of Humanities and Social Sciences chapter. Requirements for the applied computer science, civil and infrastructure engineering, computer engineering, computer science, electrical engineering, IT, and systems engineering undergraduate degree programs are provided in the academic departments’ sections of this chapter.

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. That chapter also lists additional university requirements for minor programs and additional (double) majors.

Academic Progression, Course Repeat

Students majoring in the Volgenau School programs are expected to have an acceptable plan of study formulated with assistance from the department advisor on file. They are expected to make reasonable progress toward their degree during each semester they are enrolled. Undergraduate students may be required to obtain permission from the Volgenau School Student Services Office to repeat some courses required for the major in which they have previously received a grade of D or F. Individual Volgenau School programs may disallow students from retaking 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. Exceptions are 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 departments. 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. The respective computer science or engineering student’s department might approve requests for some IT courses, such as IT 350, 362, 462, and 466, to satisfy degree requirements. For more information, contact the department or the Volgenau School Student Services Office at 703-993-1511.

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 15 master of science programs in its academic units. Policies regarding admission and degree requirements are provided in the department sections that follow.

<table>
<thead>
<tr>
<th>MS Degree</th>
<th>Department</th>
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<tr>
<td>Applied Information Technology</td>
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<tr>
<td>Civil and Infrastructure Engineering</td>
<td>CEIE</td>
</tr>
<tr>
<td>Computer Engineering</td>
<td>ECE</td>
</tr>
<tr>
<td>Computer Forensics</td>
<td>ECE</td>
</tr>
<tr>
<td>Computer Science</td>
<td>CS</td>
</tr>
<tr>
<td>Electrical Engineering</td>
<td>ECE</td>
</tr>
<tr>
<td>Epidemiology and Biostatistics</td>
<td>STAT</td>
</tr>
<tr>
<td>Information Security and Assurance</td>
<td>CS</td>
</tr>
<tr>
<td>Information Systems</td>
<td>CS</td>
</tr>
<tr>
<td>Operations Research</td>
<td>SEOR</td>
</tr>
<tr>
<td>Real Estate Development</td>
<td>CEIE</td>
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</tbody>
</table>
Doctor of Philosophy Programs

The Volgenau School offers 5 PhD programs in 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 15 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>PhD Degree</th>
<th>Department</th>
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</thead>
<tbody>
<tr>
<td>Civil and Infrastructure Engineering pending SCHEV approval</td>
<td>CEIE</td>
</tr>
<tr>
<td>Computer Science</td>
<td>CS</td>
</tr>
<tr>
<td>Electrical and Computer Engineering</td>
<td>ECE</td>
</tr>
<tr>
<td>Information Technology</td>
<td>Interdisciplinary</td>
</tr>
<tr>
<td>Statistical Science</td>
<td>STAT</td>
</tr>
<tr>
<td>Systems Engineering and Operations Research</td>
<td>SEOR</td>
</tr>
</tbody>
</table>

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. Students who are awarded an engineer degree will be able, at a later date, to work toward a PhD in information technology. Details about the engineer degree can be found in the Interdisciplinary Programs section of this chapter.

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. Courses from the other institutions may be offered at Mason’s Fairfax or Prince William campuses. For more information, go to volgenau.gmu.edu/graduates/commonwealth_graduate_engineering.php.

Applied Information Technology
School: The Volgenau School of Information Technology and Engineering

**Faculty**

**Professors:** Gantz (chair), Jajodia, Marchant

**Associate professor:** Snow (associate chair)

**Assistant professors:** Aksoy, Boicu, Bruno, Rytikova, Wang

**Instructors:** D’Alessandro, Garrison, Islam, Lyons, Quinn, Sanghera

**Adjunct professors:** Alper, Angelone, Curts, Enochson, Farrell, Haliyur, Hammond, Jalinous, Kahrl, Khan, Long, Lord, Montana, Moody, Phung, Raymond, Reo, Ronk, Santucci, Schorling, West, Zabin

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, technical and leadership skills.

The BS in 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 number of certificate programs 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 500/600 level IT courses in the Courses chapter of this catalog.

**Undergraduate Degree**

**Information Technology, BS**

**Banner Code:** VS-BS-INFT

**School:** The Volgenau School of Information Technology and Engineering

**Department:** Applied Information Technology

The BS in 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 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.

Admission Requirements

Students who meet Mason’s general eligibility requirements may apply for admission to the IT 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.

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 IT 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. The Applied Information Technology Department is based at the Prince William Campus.

Degree Requirements

Students must fulfill all requirements for bachelors degrees. General education requirements, including humanities, social sciences, mathematics and basic sciences must be met and the BS in information technology also requires IT foundation, core, and concentration courses as described below. The IT major requires a 7-credit capstone design project to be completed over two consecutive semesters.

Foundation Courses

• IT 101 - Introduction to Information Technology Credits: 3
• IT 103 - Introduction to Computing Credits: 3
• IT 108 - Programming Fundamentals Credits: 3
• IT 212 - Computer Hardware Fundamentals Credits: 3
• STAT 250 - Introductory Statistics I Credits: 3

Core Courses

• IT 207 - Applied IT Programming Credits: 3
• IT 213 - Multimedia and Computer Graphics Credits: 3
• IT 214 - Database Fundamentals Credits: 3
• IT 223 - Information Security Fundamentals Credits: 3
• IT 300 - Modern Telecommunications Credits: 3
• IT 304 - IT in the Global Economy Credits: 3
  OR both of the following:
  • CS 105 - Computer Ethics and Society Credits: 1
  • CS 306 - Synthesis of Ethics and Law for the Computing Professional 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

Two-semester sequence of approved capstone design courses

• IT 492 - Senior Design Project I Credits: 3
• IT 493 - Senior Design Project II Credits: 4

Information Technology Concentrations

Students choose one of four 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 four concentrations.

▲ Database Technology and Programming (DTP)

• IT 208 - Program Design and Data Structures Credits: 3
• IT 308 - Event-Driven Programming Credits: 3
• IT 314 - Database Management Credits: 3
• IT 414 - Advanced Database 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 IT Credits: 3

▲ Network and Telecommunications (NTEL)

• ECE 303 - Digital Design/Intro Assembly Language Credits: 4
• IT 342 - Operating Systems Fundamentals 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 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 331 - Web I: Web Development Credits: 3
• IT 332 - Web Site Administration Credits: 3
• IT 413 - Digital Media Editing Credits: 3
• IT 415 - Information Visualization Credits: 3
• IT 431 - Web II: Advanced Web Development Credits: 3

Other Requirements
• Natural Science: 11 credits of natural science, including a sequence of two 4-credit courses with labs. Students should choose these from the list of courses approved for general education (7 of these credits apply toward general education requirements)
  • COMM 100 - Public Speaking Credits: 3
  • MATH 108 - Introductory Calculus with Business Applications Credits: 3
  • MATH 112 - Discrete Mathematics for BSIT Credits: 3 (3 of these credits apply toward general education requirements)

Sample Schedule

First Semester
• ENGL 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

Total: 15 credits

Second Semester
• Nonlab natural science (3)
• Literature (3)
• COMM 100 - Public Speaking Credits: 3
• IT 108 - Programming Fundamentals Credits: 3
• STAT 250 - Introductory Statistics I Credits: 3

Total: 15 credits

Third Semester

• Natural science with lab (4)
• Social/behavioral science (3)
• IT 207 - Applied IT Programming Credits: 3
• IT 212 - Computer Hardware Fundamentals Credits: 3
• IT 214 - Database Fundamentals Credits: 3

Total: 16 credits

Fourth Semester

• Natural science with lab (4)
• Arts (3)
• IT 213 - Multimedia and Computer Graphics Credits: 3
• IT 223 - Information Security Fundamentals Credits: 3
• MATH 112 - Discrete Mathematics for BSIT Credits: 3

Total: 16 credits

Fifth Semester

• Elective (3)
• ENGL 302 - Advanced Composition Credits: 3
• IT 341 - Data Communications and Network Principles Credits: 3
• MSOM 300 - Managing Financial Resources Credits: 3
• SYST 469 - Human Computer Interaction Credits: 3

Total: 15 credits

Sixth Semester
• 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

Total: 15 credits

Seventh Semester

• IT concentration course (3)
• IT concentration course (3)
• Global understanding (3)
• Elective (3)
• IT 492 - Senior Design Project I Credits: 3

Total: 15 credits

Eighth Semester

• IT concentration course (3)
• IT concentration course (3)
• Elective (3)
• IT 493 - Senior Design Project II Credits: 4

Total: 13 credits

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 IT course. To graduate with the BS in 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: The Volgenau School of Information Technology and 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). Elective courses selected for the technical focus area must be approved by an IT advisor.

Certificate Requirements

Core Courses (15 credits)

- IT 101 - Introduction to Information Technology Credits: 3
- IT 103 - Introduction to Computing Credits: 3
- IT 108 - Programming Fundamentals Credits: 3

AND select two of the following:

- IT 212 - Computer Hardware Fundamentals Credits: 3
- IT 213 - Multimedia and Computer Graphics Credits: 3
- IT 214 - Database Fundamentals Credits: 3
- STAT 250 - Introductory Statistics I Credits: 3

Course Work

- Technical Focus Area Credits: 9

Undergraduate Minor

Information Technology Minor

Banner Code: AIT

School: The Volgenau School of Information Technology and 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 obtain a list of approved electives from the Applied Information Technology Department.

**Minor Requirements**

**Core Courses (9 credits)**

- IT 101 - Introduction to Information Technology Credits: 3
- IT 103 - Introduction to Computing Credits: 3
- IT 108 - Programming Fundamentals Credits: 3

**Course Work**

- Technical Focus Area Credits: 6

**Bachelor's/Accelerated Master's Program**

**Information Technology, BS/Telecommunications, Accelerated MS**

*School: The Volgenau School of Information Technology and Engineering*

*Department: Applied Information Technology*

Students in the BS in 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. 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. Note: Students in the accelerated program must take ECE 301 as one of their BS in information technology concentration electives.

Applicants must be Mason undergraduate students in the BS in 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. They must then maintain a minimum 3.00 GPA in the graduate segment of the accelerated program. Should their GPA fall below 3.00 while a graduate student, they will be dropped from the accelerated program to the regular program, and those graduate TCOM courses taken and applied to the BS in information technology will no longer be admissible for the MS in TCOM. If students are dropped from the accelerated program and have taken and applied TCOM core courses toward the BS degree, then they need not repeat those courses for the regular MS in TCOM Program if they obtained a grade of B or higher in those courses. But they will need to take elective courses in their place to satisfy the 30-credit requirement for the regular MS in TCOM.

Similarly, if students are dropped from the accelerated program and have taken and applied non core TCOM courses toward the BS degree, then they do not need to repeat those courses for the regular MS in TCOM Program if they obtained a grade of C or higher for those courses. Elective courses will be required to replace TCOM courses already taken and dropped from the program. Note: Up to two C grades may be carried in the regular TCOM program in non mandatory core courses. A minimum GPA of 3.00 is required to graduate with an MS in TCOM.

Students must complete all requirements for the BS degree. 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 TCOM is granted on completion of all requirements for the accelerated degree.

TCOM courses that may be taken as an undergraduate student as part of the Accelerated BS in Information Technology/MS in TCOM Program are noted in the listing below. Note: All of the prerequisite courses indicated below must be passed with a grade of B or higher.

### Degree Requirements

#### 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)

**Note:**

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.
Master's Degree

Applied Information Technology, MS

Banner Code: VS-MS-AIT

School: The Volgenau School of Information Technology and Engineering

Department: Applied Information Technology

We propose to provide the very best graduate education in IT for high-potential leaders, especially those working with 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 the management of mega-systems from data to decision in the private and federal sectors. Faculty includes 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 as adjunct professors and guest lecturers. The faculty exposes 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 have earned a GPA of 3.00 or better over 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.
- Show satisfactory performance on the GRE if they have not earned a bachelor’s degree from a U.S. university.
- 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 (12 credits)

- ECE 590 - Selected Topics in Engineering Credits: 3
- SYST 659 - Topics in Systems Engineering Credits: 3
- IT 665 - Managing Information Technology Programs in the Federal Sector Credits: 3
- NCLC 504 - Leadership Theory, Praxis, and Development for the Information Technology Professional Credits: 3

Course Electives (15 credits)

Information Technology (choose 3):
- SYST 619 - Introduction to Architecture Based Systems Engineering. Credits: 3
- INFS 622 - Information Systems Analysis and Design Credits: 3
- SWE 621 - Software Modeling and Architectural Design Credits: 3
- Elective approved by program director Credits: 3

**Analysis & Management (choose 1):**

- GSOM 540 - Analysis of Financial Decisions Credits: 3
- SWE 625 - Software Project Management Credits: 3

**Leadership and Ethics (choose 1):**

- PHIL 644 - Business and Organizational Ethics Credits: 3
- PHIL 640 - History of Ethical Theory Credits: 3

**Capstone Course (mandatory 3 credits)**

- IT 685 - Capstone Seminar Credits: 3

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**Civil, Environmental, and Infrastructure Engineering**

Phone: 703-993-1675  
Web: civil.gmu.edu

*School: The Volgenau School of Information Technology and Engineering*

**Faculty**

**Professors:** Arciszewski, Bronzini (chair), Houck

**Associate professors:** deMonsabert, Flannery, Venigalla

**Assistant professors:** Casey, Urgessa

**Research professor:** Hero

**Adjunct professors:** Adler, Ali, Bhargava, Binning, Chase, Chipley, Choudhury, Donahue, Doyle, Gagne, Goode, Hartmann, Harrop-Williams, Matusik, McDaniel, Miller, Rodriguez, Suydam, Ward, Zobel

The Civil, Environmental, and Infrastructure Engineering (CEIE) Department offers a BS and an MS in civil and infrastructure engineering. These degree programs complement the study of civil and environmental engineering with advances in information technology (IT), and they 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 the Accreditation Board for Engineering and Technology, 111 Market Place, Suite 1050, Baltimore, Maryland 21202-4012; 410-347-7700. Students interested in pursuing doctoral education in civil and infrastructure engineering are encouraged to read the sections on the interdisciplinary PhD in information technology and PhD study in civil and infrastructure engineering.
Civil and infrastructure engineering is the study of land, transportation, water, environmental, structural, energy, and telecommunications systems 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 such as the Washington, D.C., metropolitan area.

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 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 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 and some of the ENGR and IT courses in the Courses chapter of this catalog.

Undergraduate Degree

Civil and Infrastructure Engineering, BS

Banner Code: VS-BS-CEIE

School: The Volgenau School of Information Technology and Engineering

Department: Civil, Environmental and Infrastructure Engineering

The bachelor’s degree program provides a solid foundation in the theory of civil and infrastructure engineering. Students benefit from exposure to practical civil, environmental, and infrastructure engineering problems and their solutions in the classroom, lab, and field. Students also have the opportunity to work as engineering interns each summer. The goal of the department is to graduate students who are prepared to

- Solve problems in the civil engineering domain, such as integrating the traditional civil engineering disciplines of transportation, environment, structures, construction, and water; incorporating social, political, and economic considerations; and including a conscious life-cycle costing philosophy.
- Develop and apply IT to civil engineering problems.
- Communicate effectively in written, oral, and visual ways.
- Pursue a lifelong process of learning.
- Enter the civil engineering profession as productive engineers.

Civil engineering students can look forward to a career in local, state, and federal government organizations and architectural and engineering firms that specialize in land development, transportation, water resources, environment, structures, construction, and other related fields. The program also prepares students for continuing graduate studies.

Degree Requirements

Degree requirements include 120 credits distributed in courses in three main areas: mathematics and basic science, humanities and social sciences, and civil engineering analysis and design. Students must complete each CEIE and ENGR course 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 semester to plan for the next semester’s registration. Each student is expected to complete an approved plan of study, which constitutes a learning plan for the degree program.

A variety of classes will count for credit as CEIE technical electives. All electives must be selected with the advice and approval of the academic advisor. Paid internships during the summer (CEIE 197, 198, and 199; 297, 298, and 299; and 397, 398, and 399) may also be used as technical electives.

Writing-Intensive Requirement

The university’s writing-intensive requirement for civil and infrastructure engineering majors is satisfied by the successful completion of CEIE 360.

Sample Schedule

First Semester

- ENGR 107 - Introduction to Engineering Credits: 2
- CHEM 251 - General Chemistry for Engineers Credits: 4
- ENGL 101 - Composition Credits: 3
- ENGR 183 - Engineering Computer Graphics Credits: 3
- MATH 113 - Analytic Geometry and Calculus I Credits: 4

Note:

CHEM 211 will substitute for CHEM 251

Total: 16 credits

Second Semester

- ENGR 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 Course1 Credits: 3

Total: 14 credits

Third Semester
• CEIE 290 - Engineering Computation and Design 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
• ECON 103 - Contemporary Microeconomic Principles Credits: 3
• Literature - general education course Credits: 3

Total: 16 credits

Fourth Semester

• CEIE 230 - Hydraulics Credits: 3
• COMM 100 - Public Speaking Credits: 3
• ENGR 210 - Statics and Dynamics Credits: 3
• MATH 214 - Elementary Differential Equations Credits: 3
• STAT 344 - Probability and Statistics for Engineers and Scientists I Credits: 3

Total: 15 credits

Fifth Semester

• CEIE 301 - Engineering and Economic Models in Civil Engineering Credits: 3
• CEIE 340 - Water Resource Engineering Credits: 3
• ENGL 302 - Advanced Composition Credits: 3
• ENGR 310 - Mechanics of Materials Credits: 3
• CEIE 305 - Soil Mechanics Credits: 3
• PHYS 266 - Introduction to Thermodynamics Credits: 1

Total: 16 credits

Sixth Semester

• CEIE 355 - Environmental Engineering and Science Credits: 3
• CEIE 311 - Structural Analysis Credits: 3
• CEIE 360 - Introduction to Transportation Engineering Credits: 3
• BIOL 377 - Applied Ecology Credits: 3
• CEIE 370 - Construction Systems Credits: 3

Total: 15 credits
Seventh Semester

- CEIE 400 - Civil Engineering Planning and Management Credits: 3
- ENGR 401 - Professional Practice and Management in Engineering Credits: 1
- CEIE 4xx - CEIE Technical elective Credits: 3
- CEIE 4xx - CEIE Technical elective Credits: 3
- General Education Course Credits: 3

Total: 13 credits

Eighth Semester

- CEIE 490 - Senior Design Project Credits: 3
- CEIE 4xx - CEIE Technical elective Credits: 3
- CEIE 4xx - CEIE Technical elective Credits: 3
- CEIE 4xx - CEIE Technical elective Credits: 3
- CEIE 4xx - CEIE Technical elective Credits: 3

Total: 15 credits

Note:

1 Each student must satisfy General Education requirements in two of these three areas: Arts, Global Understanding, and Western Civilization/World History. The two 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.

2 A total of six CEIE Technical Elective courses must be selected. The first four CEIE technical elective courses must be selected to satisfy a requirement of at least one additional course in four of these five technical areas: structural engineering (CEIE 412 or 413), water resources engineering (CEIE 440 or 442), environmental engineering (CEIE 450, 452, or 456), construction engineering (CEIE 471 or 472), and transportation engineering (CEIE 461 or 462). The fifth CEIE Technical Elective course may be selected from any CEIE 4xx course. The sixth CEIE Technical Elective course may be selected from any CEIE 4xx course or related advanced science or engineering course approved by the student's faculty advisor.

Bachelor's/Accelerated Master's Program

Civil and Infrastructure Engineering, BS/Civil and Infrastructure Engineering, Accelerated MS

School: The Volgenau School of Information Technology and Engineering

Department: Civil, Environmental, and Infrastructure Engineering
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.

**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.

**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.

**Master's Degree**

**Civil and Infrastructure Engineering, MS**

**Banner Code:** VS-MS-CEIE

*School: The Volgenau School of Information Technology and Engineering*

*Department: Civil, Environmental, and Infrastructure Engineering*

The MS program educates students in the theory and practice of civil, environmental, and infrastructure engineering. IT and automated tools for analyzing and solving urban systems problems are important components of the program. The civil and infrastructure engineer can look forward to pursuing a career in the private or public sector or continuing graduate study toward the PhD.

**Admission Requirements**

To be considered for admission to the program, a candidate must:

- Satisfy general university requirements for admission to a graduate program.
- Have earned a baccalaureate degree in engineering, physical sciences, economics, or other civil and infrastructure engineering-related field.
- Provide three letters of reference, submitted by former professors or supervisors.
Acceptance to the degree program is based on an assessment of the applicant’s capacity to pursue these graduate studies successfully. Consideration is given to the undergraduate record, any previous graduate work, professional work experience, reference letters, and any recent GRE scores, which are required for international students. Well-qualified students with minor admission deficiencies may be admitted subject to completing an articulation program. Courses taken in the articulation program extend the minimum requirements for the degree.

Degree Requirements

The program includes three core courses, electives selected by the student with the aid of a faculty advisor, a thesis or civil and infrastructure engineering project, and a seminar requirement. Students must complete a faculty-approved plan of study with a minimum of 30 credits of graduate work, including the thesis (6 credits) or the research project (3 credits).

Core Courses

Students must complete the following three core courses. These courses provide a common background for understanding the breadth and complexity of civil and infrastructure engineering, and introducing the application of IT and the systems approach to analyzing and solving problems in civil and infrastructure engineering.

- CEIE 601 - Infrastructure Modeling Credits: 3
- CEIE 605 - Infrastructure Systems Analysis Credits: 3
- CEIE 685 - Civil Engineering Information Management Credits: 3

Emphases

Students must select an additional five or six electives that together constitute an emphasis area. With prior approval of a faculty advisor, students may design their own emphasis or select from one of several standard emphases, including the following:

- Water and environmental systems
- IT in civil engineering
- Infrastructure management
- Civil infrastructure and security engineering
- Real estate development
- Transportation engineering

Project or Thesis

Students must complete a project (3 credits) or thesis (6 credits) under the direction of a CEIE faculty member. Under the project option, students complete 3 credits of 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).

Under the thesis option, students complete 6 credits of CEIE 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. In addition, students must make a satisfactory presentation of the thesis in the CEIE graduate seminar. 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.

Seminar Requirement
All degree candidates must attend a minimum of 10 graduate seminars approved by the CEIE Department for the degree program.

**Real Estate Development, MS**

**Banner Code: VS-MS-REAL**

**School: The Volgenau School of Information Technology and Engineering**

**Department: Civil, Environmental and Infrastructure Engineering**

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 kinds of jobs, 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.

The 36 hour curriculum includes the following:

**Core consists of the following 5 courses:**

- 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
- GSOM 746 - Real Estate Analysis and Valuation Credits: 3
- PUBP 780 - Evolution of the Washington Metropolitan Economy Credits: 3

**Real Estate Development Emphasis (Take 3 of the following 5 courses):**

- CEIE 500 - Land Development Engineering Credits: 3
- CEIE 511 - Introduction to Design and Inventive Engineering Credits: 3
- CEIE 516 - Engineering Law and Ethics Credits: 3
- CEIE 610 - Construction Systems and Management Credits: 3
- PUBP 770 - Topics in Regional and Urban Development Policy Credits: 3
Real Estate Finance Emphasis (Take 3 of the following 4 courses):

- GSOM 747 - Real Estate Finance Credits: 3
- GSOM 748 - Real Estate Investment Credits: 3
- PUBP 781 - Entrepreneurship and Economic Development Credits: 3
- PUBP 745 - Transportation and the Environment Credits: 3

Environment and Sustainability Emphasis (Take 3 of the following 5 courses):

- CEIE 501 - Sustainable Development Credits: 3
- CEIE 550 - Environmental Engineering Systems Credits: 3
- CEIE 555 - Introduction to Environmental Engineering Credits: 3
- PUBP 745 - Transportation and the Environment Credits: 3
- PUBP 781 - Entrepreneurship and Economic Development Credits: 3

Electives (Take 3 courses outside of your selected Track)

The following courses may be included as electives:

- REAL 690 - Topics in Real Estate Development Credits: 1-6
- REAL 796 - Directed Reading Credits: 1-6

Capstone Course (Final project):

- REAL 750 - MSRED Capstone Credits: 3

Master's Level Certificate

Civil Infrastructure and Security Engineering Graduate Certificate

Banner Code: VS-CERG-CISE

School: The Volgenau School of Information Technology and Engineering

Department: Civil, Environmental and Infrastructure Engineering

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.

**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 670 - Civil Engineering Decision Methods and Tools Credits: 3
- CEIE 671 - Best Engineering Management Practices Credits: 3
- CEIE 685 - Civil Engineering Information Management Credits: 3
- CEIE 690 - Topics in Civil Engineering Credits: 3
- PUAD 640 - Public Policy Process 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.

**Foundations of Real Estate Development Graduate Certificate**

Banner Code: VS-CERG-FRED

*School: The Volgenau School of Information Technology and Engineering*

*Department: Civil, Environmental and Infrastructure Engineering*

This new Graduate Degree Certificate is the first in a series of Graduate Degree Certificates with a principal focus on the Real Estate industry. In conjunction with the Volgenau School of Information Technology and Engineering, the School of Public Policy and the School of Management, the Center for Real Estate Entrepreneurship integrated the most advanced and innovative thinking from across George Mason to create an in-depth certificate exploring the fundamentals of real estate development.

The principal focus of the Certificate is to provide a thorough understanding of Real Estate concepts. The graduate certificate will educate the student in three major disciplines: leadership and management challenges in real estate development, fundamentals of real estate development and construction management, and economic evolution and development concepts.

**Admissions 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 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.

**Course Requirements**

- REAL 502 - Real Estate Client Leadership and Project Management Credits: 3
- CEIE 610 - Construction Systems and Management Credits: 3
- CEIE 671 - Best Engineering Management Practices Credits: 3
- PUBP 781 - Entrepreneurship and Economic Development Credits: 3
- PUBP 785 - Urban Development Economics Credits: 3

**Leading Technical Enterprises Graduate Certificate**

Banner Code: VS-CERG-LTE

*School: The Volgenau School of Information Technology and 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.

**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 facilities and are intended for part-time students. Some of the courses may be offered in a distance learning format.

**Certificate Requirements**

The certificate program consists of a core course, *CEIE 675 Developing the Technical Enterprise* (3 credits), and 12 elective credits (four 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) selected from the certificate program course listing:

- 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

**Note:**

These courses are accepted for credit towards the George Mason University M.S. in Civil and Infrastructure Engineering. 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.

**Sustainability and the Environment Graduate Certificate**

*Banner Code: VS-CERG-SENV*
School: The Volgenau School of Information Technology and Engineering

Department: Civil, Environmental and Infrastructure Engineering

The principal focus of this advanced certificate is to provide a detailed understanding of evolving real estate concepts, particularly as relating to land development, sustainability, 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.

Admissions 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 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 an average grade of B or better, for a total of 15 credits of graduate study.

- 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

Water Resources Engineering Graduate Certificate

Banner Code: VS-CERG-WRE

School: The Volgenau School of Information Technology and 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.

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) including two required courses (6 credits), and three elective courses (9 credits). Specific requirements are:

Required Certificate Courses (take both courses for a total of 6 credits):

- CEIE 631 - Water Resources Engineering I: Principles and Practice Credits: 3
- CEIE 732 - Water Resources Engineering II: Water Resource Systems Credits: 3

Elective Certificate 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 632 - Groundwater Systems Modeling Credits: 3

Doctoral Degree
Civil and Infrastructure Engineering, PhD (pending SCHEV approval)

Banner Code: VS-PHD-CEIE

School: The Volgenau School of Information Technology and Engineering

Department: Civil, Environmental and Infrastructure Engineering

The doctoral program offered by the CEIE Department is unique in Virginia, incorporating the varied areas of civil engineering with a focus on infrastructure operation and management. The program is structured to prepare students for advanced leadership positions in research and development in the public or private sector, academics, and government. Students may elect to study in the areas of IT and computing in civil engineering, environmental engineering, water and waste water engineering, construction engineering and management, infrastructure security and engineering, structural engineering, or transportation engineering. Requirements include course work, qualifying exams, a teaching requirement, dissertation proposal defense, and dissertation research and defense.

Admission Requirements

All general Mason and specific Volgenau School admission requirements apply. In addition, all applicants, including Mason undergraduates, must submit the following:

- Official transcript of undergraduate and graduate course work
- For applicants whose native language is not English, official TOEFL results showing a minimum 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 students who wish to be considered for a graduate teaching assistantship.
- Three letters of recommendation, with at least two from individuals with doctorates
- Recent résumé
- Substantial statement of interest that includes a description of specific area of proposed dissertation research, contacts they have made with potential faculty advisors, and an explanation of career and research goals
- Official results of the GRE general test are recommended for students with BS or MS degrees obtained outside the United States

Applicants will be encouraged to schedule an interview with the graduate coordinator or faculty member in their proposed area of research. Admission decisions will be based on the student’s qualifications and the availability of a faculty advisor. The application material will be reviewed by the department doctoral committee and decisions made with input from appropriate faculty members.

The application material will be reviewed by the graduate admissions officer for the department and decisions made with input from appropriate faculty members and/or the department chair.

Degree Requirements

With the completion of a BS degree, 72 additional credits are required to complete a PhD in civil and infrastructure engineering. Of these 72 credits, 24 are required for dissertation research. Students may apply up to 24 credits from their MS degree toward their required 72 credits beyond the BS subject to the approval of the dissertation committee and the CEIE Department chair. Students with degrees earned outside the United States may use some course credit toward the required 72 credits but not more than 24 credits.
Of the 72 credits beyond the BS, 48 credits of course work are required. Of these 48 hours, a maximum of 18 credits (normally part of the MS or equivalent program) may be at the 500 level, and a minimum of 9 credits at the 700 level or higher must be completed. For courses taken elsewhere, the PhD director must determine equivalent levels and obtain approval from the CEIE Department chair to apply these courses to the required 48 credits of course work. Individualized reading courses at any level cannot exceed 6 credits. A minimum GPA of 3.50 is required and no C grades are allowed for the 24 credits earned beyond the MS.

Students are also required to take a minimum of 3 credits of statistics at the 500 level or above outside the CEIE Department. Substitution of quantitative or scientific course work in some other discipline that is more relevant to the intended doctoral research may be approved by the dissertation committee and the department chair.

Research work in the PhD program is to be completed in courses CEIE 998 and CEIE 999. A minimum of 12 credits of CEIE 998 (Doctoral Dissertation Proposal Preparation) and 12 credits of CEIE 999 (Doctoral Dissertation) are to be completed. Students cannot enroll in CEIE 999 before the research proposal is presented and approved by the dissertation committee.

Qualifying Exam

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 familiarity with concepts presented at the MS level or post-BS level and serve as guidance for the dissertation director to help shape the student’s course work needs at the PhD level.

Students entering with an MS degree must take the qualifying exam on completion of 18 credits of study. Students entering without an MS degree must take the qualifying exam on completion of 24 credits. The qualifying exam consists of a written exam taken in an eight-hour period and an oral interview attended by an examining committee of at least five members of the CEIE faculty. The qualifying exam may be repeated once. A student failing the qualifying exam twice will be removed from the program.

The qualifying exam includes information from the following focus areas:

- Area A: Water and Environmental Engineering
- Area B: Information Technology and Computing in Civil Engineering
- Area C: Construction Engineering and Management
- Area D: Land Development Engineering
- Area E: Transportation Engineering
- Area F: Infrastructure and Security Engineering
- Area G: Structural Engineering

Prior to the exam, students are required to select two focus areas for examination. Candidates for the PhD in information technology and engineer degree in information technology who wish to transfer to the PHD-CEIE program who have successfully completed two qualifying exams based on CEIE courses are not required to take the CEIE qualifying exam.

Dissertation Committee

A dissertation committee is recommended to be formed within the first semester following successful completion of the qualifying exams. The dissertation committee is to consist of the CEIE Department dissertation director, two or more 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. The composition of the dissertation committee must be approved by the CEIE Department chair.

Research Competency Exam, Dissertation Proposal Defense
Students may not schedule their dissertation proposal defense (research competency exam) before successful completion of the qualifying exam. On completing all course work and successfully passing the qualifying exam, students are to present their written dissertation proposal to their dissertation committee. The dissertation proposal defense includes a written proposal and presentation of the intended direction of the dissertation research. The dissertation proposal defense is not to include completed research because the dissertation committee is to use the dissertation proposal defense to provide input and guidance to the student prior to beginning dissertation research. The dissertation proposal defense is also an opportunity for 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. The exam is administered by the student’s dissertation committee and must be attended by all dissertation committee members and the department chair.

In preparation for the dissertation proposal defense, the student shall prepare a written dissertation proposal outlining the intended direction of the research and the review of existing research previously published on the topic. The dissertation proposal shall be submitted to the dissertation committee for review at least two weeks prior to the dissertation proposal defense date. The dissertation proposal is then presented by the student as part of the research competency exam. If a student fails the competency exam, the student may request to take the exam again through a formal written request to the doctoral dissertation director within 60 days of receiving notice of the exam result. If the student fails the competency exam and does not request to take the exam again within 60 days of the original date, the student will be dismissed from the PhD program. After successful completion of this requirement, the student is formally admitted as a PhD candidate.

**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 and recitations in the CEIE Department to undergraduate students. Working with his or her doctoral dissertation advisor, the candidate will gain experience in the classroom that will benefit the student should he or she decide to pursue an academic or an advanced research career.

**Dissertation Research and Defense**

On successful completion of the dissertation proposal, students are to conduct 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 dissertation to the doctoral dissertation committee and schedule an oral predefense with the doctoral dissertation committee. The predefense 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 predefense, which will allow for a minimum of two weeks to advertise the defense. 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 predefense 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.

**Concentration**
Concentration in Civil and Infrastructure Engineering (CEIE)

Students who pursue a concentration in this doctoral program will have the concentration noted on their transcript. The degree conferred on a graduating student is a PhD in information technology with a concentration in civil and infrastructure engineering. Students may also pursue such doctoral studies without designating a concentration.

Requirements

Students seeking this concentration must satisfy all the requirements for the PhD in information technology degree. In addition, the following requirements must be met:

Plan of Study

All decisions concerning the student’s course requirements and plan of study must be approved by the advisor or director, with the consent of the CEIE Department chair.

Doctoral Supervisory Committee

The dissertation director must be a CEIE Department faculty member. The composition of the doctoral supervisory committee is to be approved by the CEIE Department chair and the Volgenau School associate dean for research and graduate studies. Permission for the comprehensive exam and the dissertation defense is requested from the Volgenau School associate dean on the basis of a written request and plan approved by the supervisory committee and the CEIE Department chair.

Computer Science

Phone: 703-993-1530
Web: cs.gmu.edu

School: The Volgenau School of Information Technology and Engineering

Faculty

Professors: Barbara, J. Chen, DeJong, Gomaa (chair), Kerschberg, Menascé, Motro, Offutt, Pullen, Sibley, Sood, Tecuci, Wechsler


Assistant professors: S. Chen, Li, Lien, Lin, T. Maddox, Malek, Rangwala, Shehu, Sousa, Stavrou, X. Wang, Zhong

Instructors: Fleck, Heishman, Nordstrom

Adjunct professors: Abdurazik, Ahmed, Alazzawe, Armour, Baldo, Dean, Ellis, Foxwell, Geldon, Gravatt, Howard, Hwang, Kakarlamudi, Kodalı, M. Maddox, Martin, Masiyoswski, Nidiffer, Olimpiew, Pettit, Ritchey, Scoggins, Sharif, Smeltzer, Smith

Emeritus faculty: Baum, Hamburger, Rine

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, astroinformatics, 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 such as e-mail, wireless networking, online group gaming, social networks, 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, as well as some IT courses, 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 elect 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: The Volgenau School of Information Technology and 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, consisting of humanities, social sciences, synthesis, and basic science requirements (if needed), 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 330 - Formal Methods and Models Credits: 3
- CS 367 - Computer Systems and Programming Credits: 3
- CS 421 - Software Requirements and Design Modeling 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 (At least 36 credits):**

At least 36 additional credits to meet course requirements of one of the concentrations. These credits include either STAT 344 or a course in statistics relevant to the concentration. Current concentrations are biology, computer game design, geography, and software engineering.

▲ **Concentration in Biology (BIOL)**

**Foundation (24 credits):**

- BIOL 213 - Cell Structure and Function Credits: 4
- BIOL 303 - Animal Biology Credits: 4
- BIOL 304 - Plant Biology Credits: 4
- BIOL 305 - Biology of Microorganisms Credits: 3
- BIOL 306 - Biology of Microorganisms Laboratory Credits: 1
- CHEM 211 - General Chemistry Credits: 4
- CHEM 212 - General Chemistry Credits: 4
Core (16-17 credits):

- BIOL 311 - General Genetics Credits: 4
- BIOL 385 - Biotechnology and Genetic Engineering Credits: 3
- BIOL 482 - Introduction to Molecular Genetics Credits: 3
- BIOL 580 - Computer Applications for the Life Sciences Credits: 3

AND one of the following:

- BIOL 312 - Biostatistics Credits: 4
- STAT 344 - Probability and Statistics for Engineers and Scientists I Credits: 3

One BIOL course numbered above 300 (3-4 credits)

▲ Concentration in Computer Game Design (CGDS)

Foundation (13 credits):

- CS 225 - Culture and Theory of Games Credits: 3
- CS 325 - Introduction to Game Design 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 - Digital Art and Animation Credits: 4
- AVT 383 - Three-Dimensional Digital Art Credits: 4

Two approved electives related to game design (6 credits)

A list of relevant courses can be obtained from the department office.

(Natural science requirement will include PHYS 160/161 and 260/261.)
▲ Concentration in Geography (GEOG)

Foundation (18 credits):

- GEOG 101 - Major World Regions Credits: 3
- GEOG 102 - Physical Geography Credits: 3
- GEOG 103 - Human Geography Credits: 3
- GEOG 110 - Maps and Mapping Credits: 3
- GEOG 300 - Quantitative Methods for Geographical Analysis Credits: 3
- STAT 344 - Probability and Statistics for Engineers and Scientists I Credits: 3

Core (19 credits):

- GEOG 310 - Introduction to Digital Cartography Credits: 4
- GEOG 311 - Introduction to Geographic Information Systems Credits: 3
- GEOG 411 - Advanced Digital Cartography Credits: 3
- GEOG 412 - Aerial Photography Interpretation Credits: 3
- GEOG 416 - Satellite Image Analysis Credits: 3
- GEOG 463 - Applied Geographic Information Systems Credits: 3

One GEOG course numbered above 300 (3 credits)

▲ Concentration in Software Engineering (SWE)

Foundation (6 credits):

- STAT 250 - Introductory Statistics 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):

- ENGL 410 - Professional and Technical Writing Credits: 3

AND one of the following:

- PSYC 333 - Industrial and Organizational Psychology Credits: 3
- COMM 320 - Business and Professional Communication Credits: 3
- COMM 335 - Organizational Communication Credits: 3

Note:

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.

Sample Schedules

Biology Concentration Sample Schedule

First Semester

- BIOL 213 - Cell Structure and Function Credits: 4
- CS 101 - Preview of Computer Science Credits: 2
- CS 112 - Introduction to Computer Programming Credits: 4
- ENGL 101 - Composition Credits: 3
- MATH 113 - Analytic Geometry and Calculus I Credits: 4

Total: 17 credits

Second Semester
• BIOL 303 - Animal Biology Credits: 4
• 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

Total: 15 credits

Third Semester

• CHEM 211 - General Chemistry Credits: 4
• CS 262 - Introduction to Low-Level Programming Credits: 1
• CS 310 - Data Structures Credits: 3
• ECE 301 - Digital Electronics Credits: 3
• MATH 125 - Discrete Mathematics I Credits: 3

Total: 14 credits

Fourth Semester

• Western civilization course Credits: 3
• BIOL 304 - Plant Biology Credits: 4
• CHEM 212 - General Chemistry Credits: 4
• CS 367 - Computer Systems and Programming Credits: 3

Total: 14 credits

Fifth Semester

• Literature course Credits: 3
• BIOL 305 - Biology of Microorganisms Credits: 3
• BIOL 306 - Biology of Microorganisms Laboratory Credits: 1
• CS 330 - Formal Methods and Models Credits: 3
• CS 465 - Computer Systems Architecture Credits: 3
• MATH 203 - Linear Algebra Credits: 3

Total: 16 credits
Sixth Semester

- Arts course Credits: 3
- BIOL 311 - General Genetics Credits: 4
- BIOL 482 - Introduction to Molecular Genetics Credits: 3
- CS 421 - Software Requirements and Design Modeling Credits: 3
- ENGL 302 - Advanced Composition Credits: 3

Total: 16 credits

Seventh Semester

- Global understanding course Credits: 3
- Social science course Credits: 3
- BIOL 385 - Biotechnology and Genetic Engineering Credits: 3
- CS 483 - Analysis of Algorithms Credits: 3

AND one of the following:

- BIOL 312 - Biostatistics Credits: 4
- STAT 344 - Probability and Statistics for Engineers and Scientists I Credits: 3

Total: 15-16 credits

Eighth Semester

- BIOL Senior course Credits: 3
- CS Senior course Credits: 3
- Synthesis course Credits: 3
- Elective Credits: 1
- BIOL 580 - Computer Applications for the Life Sciences Credits: 3

Total: 13 credits

Computer Game Design Concentration Sample Schedule

First Semester
• CS 101 - Preview of Computer Science Credits: 2
• CS 112 - Introduction to Computer Programming Credits: 4
• ENGL 101 - Composition Credits: 3
• MATH 113 - Analytic Geometry and Calculus I Credits: 4
• COMM 100 - Public Speaking Credits: 3

Total: 16 credits

Second Semester

• Western civilization course Credits: 3
• 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

Total: 15 credits

Third Semester

• 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

Total: 16 credits

Fourth Semester

• Literature elective Credits: 3
• CS 325 - Introduction to Game Design Credits: 3
• CS 367 - Computer Systems and Programming Credits: 3
• STAT 344 - Probability and Statistics for Engineers and Scientists I Credits: 3
• MATH 125 - Discrete Mathematics I Credits: 3

Total: 15 credits
Fifth Semester

- PHYS 160 - University Physics I Credits: 3
- PHYS 161 - University Physics I Laboratory Credits: 1
- AVT 382 - Digital Art and Animation Credits: 4
- CS 330 - Formal Methods and Models Credits: 3
- CS 421 - Software Requirements and Design Modeling Credits: 3

Total: 14 credits

Sixth Semester

- Global understanding course Credits: 3
- PHYS 260 - University Physics II Credits: 3
- PHYS 261 - University Physics II Laboratory Credits: 1
- AVT 383 - Three-Dimensional Digital Art Credits: 4
- ENGL 302 - Advanced Composition Credits: 3

Total: 14 credits

Seventh Semester

- Game elective Credits: 3
- Elective Credits: 3
- CS 425 - Game Programming I Credits: 3
- CS 451 - Computer Graphics Credits: 3
- CS 465 - Computer Systems Architecture Credits: 3

Total: 15 credits

Eighth Semester

- CS Senior course Credits: 3
- Game elective Credits: 3
- Synthesis Credits: 3
- CS 426 - Game Programming II Credits: 3
- CS 483 - Analysis of Algorithms Credits: 3
Total: 15 credits

Geography Concentration Sample Schedule

First Semester

- CS 101 - Preview of Computer Science Credits: 2
- CS 112 - Introduction to Computer Programming Credits: 4
- ENGL 101 - Composition Credits: 3
- GEOG 102 - Physical Geography Credits: 3
- MATH 113 - Analytic Geometry and Calculus I Credits: 4

Total: 16 credits

Second Semester

- COMM 100 - Public Speaking Credits: 3
- CS 105 - Computer Ethics and Society Credits: 1
- CS 211 - Object-Oriented Programming Credits: 3
- GEOG 103 - Human Geography Credits: 3
- MATH 114 - Analytic Geometry and Calculus II Credits: 4

Total: 14 credits

Third Semester

- Western civilization course Credits: 3
- CS 262 - Introduction to Low-Level Programming Credits: 1
- CS 310 - Data Structures Credits: 3
- ECE 301 - Digital Electronics Credits: 3
- GEOG 101 - Major World Regions Credits: 3
- MATH 125 - Discrete Mathematics I Credits: 3

Total: 16 credits

Fourth Semester
- Arts course  Credits:  3
- CS 367 - Computer Systems and Programming Credits: 3
- GEOG 311 - Introduction to Geographic Information Systems Credits: 3
- GEOG 110 - Maps and Mapping Credits: 3
- MATH 203 - Linear Algebra Credits: 3

Total: 15 credits

**Fifth Semester**

- Natural science course  Credits:  4
- CS 330 - Formal Methods and Models Credits: 3
- CS 465 - Computer Systems Architecture Credits: 3
- GEOG 300 - Quantitative Methods for Geographical Analysis Credits: 3
- GEOG 412 - Aerial Photography Interpretation Credits: 3

Total: 16 credits

**Sixth Semester**

- Literature course  Credits:  3
- CS 421 - Software Requirements and Design Modeling Credits: 3
- GEOG 310 - Introduction to Digital Cartography Credits: 4
- GEOG 416 - Satellite Image Analysis Credits: 3
- STAT 344 - Probability and Statistics for Engineers and Scientists I Credits: 3

Total: 16 credits

**Seventh Semester**

- GEOG Senior  Credits:  3
- Elective  Credits:  3
- CS 483 - Analysis of Algorithms Credits: 3
- ENGL 302 - Advanced Composition Credits: 3
- GEOG 411 - Advanced Digital Cartography Credits: 3

Total: 15 credits
Eighth Semester

- CS Senior course Credits: 3
- Synthesis course Credits: 3
- Electives Credits: 3
- GEOG 463 - Applied Geographic Information Systems Credits: 3

Total: 12 credits

Software Engineering Concentration Sample Schedule

First Semester

- 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
- ENGL 101 - Composition Credits: 3

Total: 16 credits

Second Semester

- Literature course Credits: 3
- 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

Total: 14 credits

Third Semester

- 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 125 - Discrete Mathematics I Credits: 3
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<td>Elective Credits: 3</td>
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</table>

Total: 14 credits
• CS 465 - Computer Systems Architecture Credits: 3
• ENGL 410 - Professional and Technical Writing Credits: 3
• SWE 401 - Internship Reflection Credits: 1

Total: 16 credits

Eighth Semester

• 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

Total: 15 credits

Computer Science, BS

Banner Code: VS-BS-CS

School: The Volgenau School of Information Technology and 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, 111 Market Place, Suite 1050, Baltimore, Maryland 21202-4012, telephone 410-347-7700.

Degree Requirements

For the BS-CS degree, students must complete 120 credits, including the university general education requirements and all the following:

Computer science core (33 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 330 - Formal Methods and Models Credits: 3
- CS 367 - Computer Systems and Programming Credits: 3
- CS 421 - Software Requirements and Design Modeling 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 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 (23 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
• STAT 344 - Probability and Statistics for Engineers and Scientists I Credits: 3

And one of the following:

• MATH 446 - Numerical Analysis I Credits: 3
• OR 481 - Numerical Methods in Engineering Credits: 3

Note:

MATH 105 and MATH 108 cannot be counted toward this degree.

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 Simulation Modeling 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
• PHIL 376 - Symbolic Logic Credits: 3
• Any MATH or CS course numbered above 300 (except MATH 351)

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 Sciences:

• 12 credits in courses intended for scientists and engineers. Two of the courses for this requirement must have laboratory components and constitute a sequence. A list of relevant courses can be obtained from the department office.
COMM 100 (3 credits):

Computer science students must make a technical presentation. The course fulfills the general education requirement in oral communication for Volgenau School students.

And:

Three credits in arts, humanities, or social science in addition to the general education requirements.

Additional Information:

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.

Sample Schedule

First Semester

- Western civilization course Credits: 3
- CS 101 - Preview of Computer Science Credits: 2
- CS 112 - Introduction to Computer Programming Credits: 4
- ENGL 101 - Composition Credits: 3
- MATH 113 - Analytic Geometry and Calculus I Credits: 4

Total: 16 credits

Second Semester

- 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

Total: 14 credits

Third Semester

- Natural science course Credits: 4
- Social and behavioral science course Credits: 3
- CS 262 - Introduction to Low-Level Programming Credits: 1
- ECE 301 - Digital Electronics Credits: 3
- MATH 213 - Analytic Geometry and Calculus III Credits: 3

Total: 14 credits

Fourth Semester

- Natural science course Credits: 4
- General elective Credits: 3
- COMM 100 - Public Speaking Credits: 3
- CS 310 - Data Structures Credits: 3
- MATH 125 - Discrete Mathematics I Credits: 3

Total: 16 credits

Fifth Semester

- Global understanding course Credits: 3
- CS 330 - Formal Methods and Models Credits: 3
- CS 367 - Computer Systems and Programming Credits: 3
- ENGL 302 - Advanced Composition Credits: 3
- MATH 203 - Linear Algebra Credits: 3

Total: 15 credits

Sixth Semester

- Humanities course Credits: 3
- Natural science course Credits: 4
- CS 421 - 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

Total: 16 credits

Seventh Semester
• 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

AND one of the following:

• OR 481 - Numerical Methods in Engineering Credits: 3
• MATH 446 - Numerical Analysis I Credits: 3

Total: 15 credits

Eighth Semester

• 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

Total: 14 credits

Change of Major

Students requesting a change of major to computer science must have a GPA of at least 2.75 and successfully completed two of the following: CS 112, CS 211; 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 the student for credit in CS 112. An AP score of 4, 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 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 421. 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 Post-Bachelor's Certificate

Banner Code: VS-CERB-CS

School: The Volgenau School of Information Technology and 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.

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 minor.

Certificate Requirements

Basic Computer Science:

- 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
Math:

- MATH 125 - Discrete Mathematics I Credits: 3
- MATH 213 - Analytic Geometry and Calculus III Credits: 3

Completion of one of the following:

- CS 483 - Analysis of Algorithms Credits: 3

AND two of the following:

- CS 421 - 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

OR:

- 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

Undergraduate Minor

Computer Science Minor

Banner Code: CS

School: The Volgenau School of Information Technology and Engineering
Department: Computer Science

Course Requirements

The minor requires completion of at least 17 credits. Required courses are:

- 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:

- 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 should be selected from the following:

- 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 421 - Software Requirements and Design Modeling 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

For policies governing all minors, see the Academic Policies chapter of this catalog.

Students should pay careful attention to prerequisites when selecting courses.

Software Engineering Minor

Banner Code: SWE
Course Requirements

Candidates for the minor in software engineering must complete 16 credits in software engineering with a minimum GPA of 2.00, comprising:

- 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:

- CS 332 - Object-Oriented Software Design and Implementation Credits: 3
- CS 421 - Software Requirements and Design Modeling 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

At least 8 credits must be used only for the minor and not for the student's major.

For policies governing all minors, see the Academic Policies chapter of this catalog.

Bachelor's/Accelerated Master's Program

Computer Science, BS/Computer Science, Accelerated MS

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. That is, students must register for two of the following courses in place of the corresponding 400-level courses:

- 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 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: The Volgenau School of Information Technology and 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: The Volgenau School of Information Technology and 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: The Volgenau School of Information Technology and 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.
Information Technology, BS/Information Security and Assurance, Accelerated MS

School: The Volgenau School of Information Technology and Engineering

Department: Computer Science

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 Information Technology Program may apply for this program if they have earned 90 undergraduate credits with an overall GPA of at least 3.30. In addition, students must have completed INFS 515 and 519 with a 3.00 or better. 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.

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.

Information Technology, BS/Information Systems, Accelerated MS

School: The Volgenau School of Information Technology and Engineering

Department: Computer Science

This program is for students interested in immediately continuing on to graduate studies in information systems.

Admission Requirements

Students in the BS in Information Technology Program may apply if they have earned 90 undergraduate credits with an overall GPA of at least 3.30. In addition, students must have completed INFS 515 and 519 with a 3.00 or better. Criteria for admission are identical to the criteria for admission to the MS 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.
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.

Information Technology, BS/Software Engineering, Accelerated MS

School: The Volgenau School of Information Technology and Engineering

Department: Computer Science

This program is for students interested in immediately continuing on to graduate studies in software engineering.

Admission Requirements

Students in the BS in Information Technology Program may apply to this program if they have earned 90 undergraduate credits with an overall GPA of at least 3.30. In addition, students must have completed INFS 515 and 519 with a 3.00 or better. 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 and 622.

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.

Master's Degree

Computer Science, MS

Banner Code: VS-MS-CS

School: The Volgenau School of Information Technology and 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 do not have a graduate class as prerequisite,
and advanced classes, which have a graduate class as 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.

**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.

**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 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.
- Have 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 report.

**Degree Requirements**

In addition to general university requirements, completion of this program requires 30 credits of graduate courses as follows:

- At least five classes (15 credits) must qualify as “advanced” by having suitable graduate courses as prerequisites.
- Advanced classes must be taken from three different areas. The list of preapproved classes with the areas they belong to is provided below.
- At least six classes, including two advanced classes, must be designated CS.
- At least eight classes have to be taken from the list of preapproved classes. Up to two computer science-related classes that are not on the list of preapproved classes may be taken with Computer Science Department approval.
- All prerequisites must be satisfied. In some cases, basic classes (including CS 583) may be skipped with approval of the Computer Science Department if equivalent undergraduate classes were taken previously.
- CS 583 - Analysis of Algorithms Credits: 3

**Preapproved MS CS Courses by Area**

**Artificial Intelligence and Databases**

- CS 580 - Introduction to Artificial Intelligence Credits: 3
- CS 650 - Database Engineering Credits: 3
- CS 667 - Biometrics 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 750 - Theory and Applications of Data Mining Credits: 3
• CS 771 - Neural Networks Credits: 3
• CS 775 - Advanced Pattern Recognition Credits: 3
• CS 780 - Data Mining in Multimedia Databases Credits: 3
• CS 782 - Machine Learning Credits: 3
• CS 785 - Knowledge Acquisition and Problem Solving Credits: 3
• INFS 614 - Database Management Credits: 3
• INFS 623 - Classical and Web Information Retrieval 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
• INFS 795 - Special Topics in Data Mining Applications Credits: 3
• ISA 765 - Database and Distributed Systems Security 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

Programming Languages and Software Engineering

• CS 540 - Language Processors Credits: 3
• CS 631 - Object-Oriented Design Patterns Credits: 3
• CS 640 - Advanced Compilers Credits: 3
• CS 645 - Programming Language Semantics Credits: 3
• CS 719 - Scaling Technologies for E-business Credits: 3
• CS 732 - Software Maintenance and Reuse Credits: 3
• ISA 640 - Programming Language Security Credits: 3
• ISA 681 - Secure Software Design 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
• 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

- CS 555 - Computer Communications and Networking Credits: 3
- CS 571 - Operating Systems Credits: 3
- CS 635 - Foundations of Parallel Computation Credits: 3
- CS 658 - Networked Virtual Environments Credits: 3
- CS 668 - Computer Architecture Systems 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 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 818 - Topics in Computer Systems Credits: 3
- ISA 562 - Information Security Theory and Practice Credits: 3
- ISA 564 - Security Laboratory 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: 3
- 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

- CS 583 - Analysis of Algorithms Credits: 3
- CS 600 - Theory of Computation 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
- CS 850 - Research Topics in Parallel Computation Credits: 3

Visual Computing

- CS 652 - Computer Graphics Credits: 3
- CS 662 - Computer Graphics Game Technologies Credits: 4
- CS 667 - Biometrics Credits: 3
- CS 682 - Computer Vision Credits: 3
Project/Thesis (optional):

Three to six of the advanced classes may be replaced by a project. 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

6 credits of:
- CS 799 - Thesis Credits: 3-6

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: 3-6
- CS 895 - Research Topics in CS Credits: 3

Information Security and Assurance, MS

Banner Code: VS-MS-ISA

School: The Volgenau School of Information Technology and 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 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 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 (10 courses). To provide the necessary background and fundamentals of information systems security and assurance, the program has four courses that are required of all students:

- CS 555 - Computer Communications and Networking Credits: 3
- CS 571 - Operating Systems Credits: 3
- ISA 562 - Information Security Theory and Practice Credits: 3
- ISA 563 - Fundamentals of Systems Programming Credits: 3

Note:

To continue in the program, students are required to obtain a B- or better grade in the required courses. Students are allowed to repeat the required classes. Students are encouraged to complete the required courses before pursuing the electives.

Elective Courses

Security Electives

To provide breadth and depth of knowledge in information security and assurance, the degree program requires four electives to be taken from the following list of ISA courses:

- 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 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
- IT 862 - Computer Security Models and Architectures Credits: 3
- IT 962 - Advanced Topics in Computer Security Credits: 3

Other Electives
The remaining two courses may be chosen from any combination of (1) courses at the ISA 600 and 700 level, including ISA 697, ISA 796, ISA 797, and ISA 798; (2) courses at the CS 500, 600, and 700 level; and (3) from the list of preapproved electives provided below. A thesis option is available whereby a student may elect to complete a 6-credit thesis.

**Approved Electives**

A full list of approved electives is given below by program:

### Information Systems (INFS)

- INFS 614 - Database Management Credits: 3
- INFS 623 - Classical and Web Information Retrieval Credits: 3
- INFS 640 - Introduction to Electronic Commerce 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 785 - Data Mining for Homeland Security Credits: 3
- INFS 790 - Information Systems Policy and Administration Credits: 3
- INFS 795 - Special Topics in Data Mining Applications Credits: 3
- INFS 797 - Advanced Topics in Information Systems Credits: 3

### Information Security and Assurance (ISA)

- 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: 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 797 - Advanced Topics in Information Security Credits: 3

### Software Engineering (SWE)

- SWE 620 - Software Requirements Analysis and Specification Credits: 3
- SWE 621 - Software Modeling and Architectural Design 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 - Database Engineering Credits: 3
• CS 652 - Computer Graphics Credits: 3
• CS 662 - Computer Graphics Game Technologies Credits: 4
• CS 668 - Computer Architecture Systems 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 750 - Theory and Applications of Data Mining 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 777 - Human-Computer Intelligent Interaction 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 537 - Introduction to Digital Image Processing (DIP) 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 - Switching and Routing in Communication Networks 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 735 - Data Compression 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 648 - Production and Inventory Systems 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 Credits: 3
• STAT 664 - Bayesian Inference and Decision Theory Credits: 3
• STAT 674 - Survey Sampling II Credits: 3
• STAT 677 - Statistical Process Control 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
Information Systems, MS

Banner Code: VS-MS-ISYS

School: The Volgenau School of Information Technology and 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

- INFS 623 - Classical and Web Information Retrieval 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 780 - Data Mining in Multimedia Databases Credits: 3
- CS 782 - Machine Learning Credits: 3
- INFS 755 - Data Mining Credits: 3
- INFS 623 - Classical and Web Information Retrieval Credits: 3
- INFS 785 - Data Mining for Homeland Security Credits: 3
- INFS 795 - Special Topics in Data Mining Applications 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 - Classical and Web Information Retrieval 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 be also 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 - Classical and Web Information Retrieval 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 785 - Data Mining for Homeland Security Credits: 3
- INFS 790 - Information Systems Policy and Administration Credits: 3
- INFS 795 - Special Topics in Data Mining Applications Credits: 3
- INFS 796 - Directed Readings in Information Technology Credits: 3
- INFS 797 - Advanced Topics in Information Systems Credits: 3

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: 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 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 - Database Engineering Credits: 3  
• CS 652 - Computer Graphics Credits: 3  
• CS 662 - Computer Graphics Game Technologies Credits: 4  
• CS 668 - Computer Architecture Systems 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 750 - Theory and Applications of Data Mining 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 773 - Real-Time Systems Design and Development Credits: 3
- CS 777 - Human-Computer Intelligent Interaction 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 633 - Coding Theory Credits: 3
- ECE 635 - Adaptive Signal Processing Credits: 3
- ECE 645 - Computer Arithmetic Credits: 3
- ECE 630 - Statistical Communication Theory 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 - Switching and Routing in Communication Networks Credits: 3
- ECE 644 - Architectures and Algorithms for Image Processing 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 735 - Data Compression 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 648 - Production and Inventory Systems 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 Credits: 3
- STAT 664 - Bayesian Inference and Decision Theory Credits: 3
- STAT 674 - Survey Sampling II Credits: 3
- STAT 677 - Statistical Process Control 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 685 - Estimation and Tracking: Principles and Techniques Credits: 3
- SYST 760 - Special Topics in Command, Control, Communications, Computing, and Intelligence Systems Engineering Credits: 3

Software Engineering, MS

Banner Code: VS-MS-SWE

School: The Volgenau School of Information Technology and 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, software assurance, software management, and web applications. 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 727 - Quality of Service for Software Architectures Credits: 3
- SWE 781 - Secure Software Design and Programming Credits: 3

Software Assurance

- ISA 562 - Information Security Theory and Practice Credits: 3
- SWE 623 - Formal Methods and Models in Software Engineering Credits: 3
- SWE 723 - Precise Modeling Credits: 3
- SWE 781 - Secure Software Design and Programming Credits: 3

Software Management
Web Applications

- 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

Elective Courses (9 credits)

Students may select the remaining courses from the list of approved courses, including other emphasis areas, available from the department office and department web site. 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: 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 - Classical and Web Information Retrieval 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 785 - Data Mining for Homeland Security Credits: 3
• INFS 790 - Information Systems Policy and Administration Credits: 3
• INFS 795 - Special Topics in Data Mining Applications Credits: 3
• INFS 797 - Advanced Topics in Information Systems Credits: 3

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: 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 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: 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 635 - Foundations of Parallel Computation Credits: 3
• CS 640 - Advanced Compilers Credits: 3
• CS 650 - Database Engineering Credits: 3
• CS 652 - Computer Graphics Credits: 3
• CS 662 - Computer Graphics Game Technologies Credits: 4
• CS 668 - Computer Architecture Systems 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 750 - Theory and Applications of Data Mining 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 773 - Real-Time Systems Design and Development Credits: 3
• CS 777 - Human-Computer Intelligent Interaction 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 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 - Switching and Routing in Communication Networks 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 735 - Data Compression 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 648 - Production and Inventory Systems 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 Credits: 3  
• STAT 664 - Bayesian Inference and Decision Theory Credits: 3  
• STAT 674 - Survey Sampling II Credits: 3  
• STAT 677 - Statistical Process Control 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 685 - Estimation and Tracking: Principles and Techniques Credits: 3  
• SYST 760 - Special Topics in Command, Control, Communications, Computing, and Intelligence Systems Engineering Credits: 3
Master's Level Certificate

Biometrics Graduate Certificate

Banner Code: VS-CERG-BMCS

School: The Volgenau School of Information Technology and Engineering

Department: Computer Science

Biometrics, the science of recovering or verifying a person’s identity, measures the physical characteristics that make people unique (including fingerprints, an eye’s retina or iris, face, hand geometry, signature, and voice) and uses those measurements for person recognition or authentication. Biometrics are related to the science of forensics, which uses and interprets physical evidence for legal purposes. The importance of biometrics lies in the fact that traditional means of identification and verification are often unreliable or cumbersome. Passwords are difficult to remember and easy to steal. Keys, driver’s licenses, and passports can be lost or forged. The human body and its behavior, on the other hand, can’t be forgotten, stolen, forged, or misplaced.

Practical uses for such biometrics are widespread and include maintaining the security for physical space and cyberspace. In particular, biometrics aids in controlling access to an office, computer network or an ATM, smart cards, and wireless communication; confirming the identity of buyers and sellers to make electronic commerce safe and reliable; confirming student identity for distant learning; and safeguarding electronic records related to health care services.

The certificate requires completion of 15 credits and consists of two required courses and three courses of choice. Projects (3 credits) can substitute for one of the choice courses. One of the three courses of choice can be taken from another department, with the advisor’s approval, provided that it belongs to the certificate’s area.

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

Required Courses (6 credits):

- CS 667 - Biometrics Credits: 3
- CS 688 - Pattern Recognition Credits: 3

Choose from the following elective courses (9 credits):
- CS 580 - Introduction to Artificial Intelligence Credits: 3
- CS 652 - Computer Graphics Credits: 3
- CS 673 - Multimedia Computing and Systems Credits: 3
- CS 682 - Computer Vision Credits: 3
- CS 686 - Image Processing and Applications Credits: 3
- CS 750 - Theory and Applications of Data Mining Credits: 3
  or
- INFS 755 - Data Mining Credits: 3
- CS 774 - Computational Vision Credits: 3
- CS 775 - Advanced Pattern Recognition Credits: 3
- CS 777 - Human-Computer Intelligent Interaction Credits: 3

Note:

Students may take either CS 750 or INFS 755 but not both.

Computer Games Technology Graduate Certificate

Banner Code: VS-CERG-CGT

School: The Volgenau School of Information Technology and 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 15 credits. Transfer credit may substitute for at most one of these courses, subject to department approval.

Certificate Requirements

Required courses (13 credits):

- CS 652 - Computer Graphics Credits: 3
- CS 658 - Networked Virtual Environments Credits: 3
- CS 662 - Computer Graphics Game Technologies Credits: 4
- CS 777 - Human-Computer Intelligent Interaction Credits: 3

Plus one course from the following:

- AVT 616 - Networked Art Practice Credits: 5
- AVT 676 - Sound and Music for Video and Animation Credits: 5
Computer Networking Graduate Certificate

Banner Code: VS-CERG-CNET

School: The Volgenau School of Information Technology and 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.

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 the following courses, for a total of 15 credits:

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

One or two of the following electives (3 or 6 credits):
Data Mining Graduate Certificate

**Banner Code:** VS-CERG-DTM

**School:** The Volgenau School of Information Technology and Engineering

**Department:** Computer Science

This graduate certificate program is intended for people interested in the analysis and knowledge discovery from large and diverse data sources. The goal of the program is to study data mining concepts and successful applications. The certificate in data mining may be pursued concurrently with any of the graduate programs in the Volgenau School.

**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. 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.

Each applicant must possess knowledge equivalent to that provided by the following courses at Mason: CS 310 Computer Science III, and STAT 344 Probability and Statistics for Engineers and Scientists.

Students not enrolled in a graduate degree program at Mason should apply for the data mining certificate program through the Volgenau School Graduate Admissions Office. Students enrolled in a graduate degree program at Mason 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 five courses, with an average grade of B or better, for a total of 15 credits of graduate study. At least one course from three of the following groups must be taken to obtain the certificate:

**Group I**

- CS 750 - Theory and Applications of Data Mining Credits: 3
- CS 780 - Data Mining in Multimedia Databases Credits: 3
- ISA 785 - Research in Digital Forensics Credits: 3
- IT 844 - Advanced Pattern Recognition Credits: 3

**Group II**

- IT 875 - Scientific and Statistical Visualization Credits: 3

or
• CSI 703 - Scientific and Statistical Visualization Credits: 3
• IT 871 - Statistical Data Mining Credits: 3
• STAT 663 - Statistical Graphics and Data Exploration Credits: 3
  or
• CSI 773 - Statistical Graphics and Data Exploration Credits: 3
• STAT 753 - Computer Intrusion Detection Credits: 3

Group III

• INFS 755 - Data Mining Credits: 3
• INFS 795 - Special Topics in Data Mining Applications Credits: 3

Group IV

• SYST 664 - Bayesian Inference and Decision Theory Credits: 3
  or
• STAT 664 - Bayesian Inference and Decision Theory Credits: 3

Database Management Graduate Certificate

Banner Code: VS-CERG-DBM

School: The Volgenau School of Information Technology and Engineering

Department: Computer Science

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.

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 five courses in information systems and IT with an average grade of B or higher, for a total of 15 credits of graduate study. To obtain the certificate, students must take the following:

Required courses (6 credits):

- INFS 614 - Database Management Credits: 3
- INFS 760 - Advanced Database Management Credits: 3

Three from the following courses (9 credits):

- INFS 623 - Classical and Web Information Retrieval 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 795 - Special Topics in Data Mining Applications Credits: 3
- INFS 797 - Advanced Topics in Information Systems Credits: 3
- ISA 765 - Database and Distributed Systems Security Credits: 3
- IT 861 - Distributed Database Management Systems Credits: 3
- IT 864 - Scientific Databases Credits: 3

E-Commerce Graduate Certificate

Banner Code: VS-CERG-ECOM

School: The Volgenau School of Information Technology and 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.

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 department for admission to the certificate program. Admission to the certificate program does not guarantee admission into any MS program.

Certificate Requirements

Students must complete five courses, with an average grade of B or better, for a total of 15 credits of graduate study. To obtain the certificate, a student must complete the following:

Two courses (6 credits):

- INFS 640 - Introduction to Electronic Commerce Credits: 3
- INFS 770 - Knowledge Management for E-Business Credits: 3

Three additional courses (9 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

Notes:

The course HAP 678 may be waived for a person with experience in health care systems management and permission of the instructor.

Foundations of Information Systems Graduate Certificate

Banner Code: VS-CERG-FIS

School: The Volgenau School of Information Technology and 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.

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

Certificate candidates must complete five courses, with an average grade of B or better, for a total of 15 credits of graduate study. To obtain the certificate, a student needs to complete the following:

Required courses (12 credits)

Take each one of the following foundation courses (no replacement is 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
Elective (3 credits)

- Take any one course from the INFS, SWE, or ISA programs that does not require any prerequisites other than the above foundation courses.

Information Engineering Graduate Certificate

Banner Code: VS-CERG-INFE

School: The Volgenau School of Information Technology and 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.

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 five courses, with an average grade of B or better, for a total of 15 credits of graduate study. 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

One of the following courses (3 credits):
- INFS 770 - Knowledge Management for E-Business Credits: 3
- SWE 625 - Software Project Management Credits: 3

**Note:**

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. For more information, contact the department or visit the department web site.

**Information Security and Assurance Graduate Certificate**

**Banner Code:** VS-CERG-ISA

**School:** The Volgenau School of Information Technology and 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.

**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 five courses with an average grade of B or better for a total of 15 credits of graduate study.

**Two required courses (6 credits):**

- ISA 562 - Information Security Theory and Practice Credits: 3
- ISA 656 - Network Security Credits: 3

**Three additional courses (9 credits):**
Three 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

Intelligent Agents Graduate Certificate

Banner Code: VS-CERG-INAG

School: The Volgenau School of Information Technology and 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.

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 15 credits:

Required (3 credits):

- CS 580 - Introduction to Artificial Intelligence Credits: 3

Plus four of the following elective courses (12 credits):

- 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 750 - Theory and Applications of Data Mining Credits: 3
- CS 777 - Human-Computer Intelligent Interaction Credits: 3
- CS 780 - Data Mining in Multimedia Databases Credits: 3
- CS 782 - Machine Learning Credits: 3
Note:

One of the four courses may be taken from another MS or PhD program in the Volgenau School with advisor approval, provided it belongs to the certificate area.

Software Architecture Graduate Certificate

Banner Code: VS-CERG-SWA

School: The Volgenau School of Information Technology and 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.

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 five courses with an average grade of B or better for a total of 15 credits of graduate study.

Required courses (9 credits):

- SWE 621 - Software Modeling and Architectural Design Credits: 3
- SWE 721 - Reusable Software Architectures Credits: 3
- SWE 727 - Quality of Service for Software Architectures Credits: 3

Elective Courses (Select two courses) (6 credits):

- CS 672 - Computer System Performance Evaluation Credits: 3
- CS 732 - Software Maintenance and Reuse Credits: 3
- CS 773 - Real-Time Systems Design and Development Credits: 3
- IT 823 - Software for Critical 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

Software Engineering Graduate Certificate

Banner Code: VS-CERG-SWE

School: The Volgenau School of Information Technology and 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.

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 five courses with an average grade of B or better for a total of 15 credits of graduate study.

Three required courses (9 credits):

- 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

Two additional courses (6 credits):

(subject to satisfying their prerequisites) from the following

- CS 675 - Distributed Systems Credits: 3
- CS 706 - Concurrent Software Systems Credits: 3
- CS 735 - Concurrency 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 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 five SWE courses. If CS/SWE 706 is included, it is possible to complete the MS in computer science and the certificate in software engineering within 30 hours.

Web-Based Software Engineering Graduate Certificate

Banner Code: VS-CERG-WBSE

School: The Volgenau School of Information Technology and 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.

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 department or the department web site. 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 five courses with an average grade of B or higher for a total of 15 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):

-
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

Doctoral Degree

Computer Science, PhD

Banner Code: VS-PHD-CS

School: The Volgenau School of Information Technology and Engineering

Department: Computer Science

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.

Qualifying Exams

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 24 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 36 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 and the associate dean for graduate studies of the Volgenau School.

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 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. 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.

PhD Study in Information Technology with CS Concentrations
Doctoral study in information systems, software engineering, and information security is available through the PhD in Information Technology Program, which offers advanced courses in these disciplines. 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.

Degree Requirements

The course requirement for the degree is 72 credits. Of these, 30 credits, at most, may be granted for an approved MS degree.

The following courses, totaling 30 credits, are required from all students:

- CS 700 - Quantitative Methods and Experimental Design in Computer Science Credits: 3
- CS 800 - Computer Science Colloquium Credits: 1
- CS 990 - Dissertation Topic Presentation Credits: 1
- CS 998 - Doctoral Dissertation Proposal Credits: 1-12
- CS 999 - Doctoral Dissertation Credits: 1-12

Note:

Students must enroll in two sections of CS 800 for a total of 2 credits.

Students may enroll in 1-to-12 credits of CS 998 and CS 999 over several semesters; the total number of credits for sections of each course must sum to 12, giving a total of 24 credits for CS 998 and CS 999.

The remaining 12 credits must be obtained in advanced graduate courses (an advanced graduate course is a graduate course that requires another graduate course as a prerequisite).

Concentration

▲ Concentration in Information Security and Assurance (ISA)

Students who pursue a concentration in this doctoral program will have the concentration noted on their transcript. The degree conferred on a graduating student is the PhD in information technology with concentration in information security. Students may also pursue such doctoral studies without designating a concentration.

Requirements

Students seeking this concentration must satisfy all requirements for the PhD in information technology. In addition, the following requirements must be met:

Plan of Study

All decisions concerning the student’s course requirements and plan of study must be approved by the advisor or director, with the consent of Computer Science doctoral coordinator.

Doctoral Supervisory Committee
The dissertation director must be a faculty member of the Volgenau School. The composition of the doctoral supervisory committee is to be approved by the Computer Science doctoral coordinator and department chair, and the Volgenau School associate dean for research and graduate studies. Permission for the comprehensive exam and dissertation defense is requested from the Volgenau School associate dean on the basis of a written request and plan that has been approved by the supervisory committee and the Computer Science doctoral coordinator.

For information regarding qualifying exams and emphasis areas, please consult the department web site.

▲ Concentration in Information Systems (ISYS)

Students who pursue a concentration in this doctoral program will have the concentration noted on their transcript. The degree conferred on a graduating student is the PhD in information technology with concentration in information systems. Students may also pursue such doctoral studies without designating a concentration.

Requirements

Students seeking this concentration must satisfy all the requirements for the PhD in information technology. In addition, the following requirements must be met:

Plan of Study

All decisions concerning the student’s course requirements and plan of study must be approved by the advisor or director, with the consent of the Computer Science doctoral coordinator.

Doctoral Supervisory Committee

The dissertation director must be a Computer Science faculty member. The composition of the doctoral supervisory committee must be approved by the Computer Science doctoral coordinator, the Computer Science chair, and the Volgenau School associate dean for research and graduate studies. Permission for the comprehensive exam and the dissertation defense is requested from the Volgenau School associate dean on the basis of a written request and plan approved by the supervisory committee and the Computer Science doctoral coordinator.

For information regarding qualifying exams and emphasis areas, please consult the department web site.

▲ Concentration in Software Engineering (SWE)

Students who pursue a concentration in this doctoral program will have the concentration noted on their transcript. The degree conferred on a graduating student is the PhD in information technology with concentration in software engineering. Students may also pursue such doctoral studies without designating a concentration.

Requirements

Students seeking this concentration must satisfy all requirements for the PhD in information technology. In addition, the following requirements must be met:

Plan of Study
All decisions concerning the student’s course requirements and plan of study must be approved by the advisor or director, with the consent of the Computer Science doctoral coordinator.

**Doctoral Supervisory Committee**

The dissertation director must be a faculty member of the Computer Science Department. The composition of the doctoral supervisory committee is to be approved by the Computer Science doctoral coordinator, the Computer Science chair, and the Volgenau School associate dean for research and graduate studies. Permission for the comprehensive exam and dissertation defense is requested from the Volgenau School associate dean on the basis of a written request and plan that has been approved by the supervisory committee and the Computer Science doctoral coordinator.

For information regarding qualifying exams and emphasis areas, please consult the department web site.

**Electrical and Computer Engineering**

Phone: 703-993-1569  
Web: ece.gmu.edu

*School: The Volgenau School of Information Technology and Engineering*

**Faculty**

**Professors:** Allnutt, Cook, Ephraim, Gertler, Griffiths, Ioannou, Jabbari, Levis, Manitius (chair), Mulpuri  
**Associate professors:** Berry, Chang, Gaj, Hintz, Mark, Pachowicz, Paris, W. Sutton, Wage  
**Assistant professors:** Hwang, Ikonomidou, Kaps, Li, Nelson, Peixoto, Sikdar  
**Research professors:** Katona, Wagenhals, Zaidi  
**Instructor:** Pandula  
**Adjunct professors:** Abgariah, Allen, Alper, Beatty, Bollino, Brooks, Follendore, Fowler, Gong, Hibey, Hockensmith, Hrnjej, Lazarevich, Leaf, Lorie, Osgood, Sabzevari, 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 in engineering 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.
and electrical engineering, and certificates in communications and networking, signal processing, and very large-scale integration design and manufacturing. The PhD in information technology is offered by The Volgenau School and includes a number of courses with an electrical engineering or computer engineering emphasis. Details about these programs are available at ite.gmu.edu.

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 and microelectronics. The department recognizes the need to augment and enhance these areas through the use of modern IT. Graduate students are offered a progressive environment with ample opportunities for the type of advanced engineering 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, BENG and CRFS in the Courses chapter of this catalog. The department also offers most of the courses designated TCOM and some ENGR and IT courses.

Undergraduate Degree

Computer Engineering, BS

Banner Code: VS-BS-CPE

School: The Volgenau School of Information Technology and Engineering

Department: Electrical and Computer Engineering

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.

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 the Accreditation Board for Engineering and Technology, 111 Market Place, Suite 1050, Baltimore, Maryland 21202-4012; 410-347-7700. The computer engineering program is staffed by 25 full-time professors, including five 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. 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, the Institute of Electrical and Electronics Engineers, and Rockwell International.

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 as follows:

**Electrical and computer engineering:**
- 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**
Computer science:
- 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

Engineering:
- ENGR 107 - Introduction to Engineering Credits: 2

Literature general education course Credits: 3
Arts general education course Credits: 3
Global understanding general education course Credits: 3

English:
- ENGL 101 - Composition Credits: 3
- ENGL 302 - Advanced Composition Credits: 3
- COMM 100 - Public Speaking Credits: 3

Economics:
- ECON 103 - Contemporary Microeconomic Principles Credits: 3

Western Civilization: (choose one of these)
- HIST 100 - History of Western Civilization Credits: 3
- HIST 125 - Introduction to World History Credits: 3

Mathematics:
- 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:
- 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

Note:
The general education synthesis requirement is satisfied by ECE 492 plus ECE 493. 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. 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. 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.

Sample Schedule

The following presents a sample schedule that undergraduate computer engineering majors would pursue to obtain a bachelor’s degree.

First Semester

- CS 112 - Introduction to Computer Programming Credits: 4
- ECON 103 - Contemporary Microeconomic Principles Credits: 3
- ENGL 101 - Composition Credits: 3
- ENGR 107 - Introduction to Engineering Credits: 2
- MATH 113 - Analytic Geometry and Calculus I Credits: 4

Total: 16 credits

Second Semester

- 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

Total: 14 credits

Third Semester

- 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

Total: 16 credits

Fourth Semester
• 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

Total: 15 credits

Fifth Semester

• ECE 333 - Linear Electronics I Credits: 3
• ECE 334 - Linear Electronics Lab I Credits: 1
• ECE 445 - Computer Organization Credits: 3
• ENGL 302 - Advanced Composition Credits: 3
• STAT 346 - Probability for Engineers Credits: 3
• CS 262 - Introduction to Low-Level Programming Credits: 1

Total: 14 credits

Sixth Semester

• COMM 100 - Public Speaking Credits: 3
• CS 367 - Computer Systems and Programming Credits: 3
• ECE 465 - Computer Networking Protocols Credits: 3
• CS 471 - Operating Systems Credits: 3
• PHYS 262 - University Physics III Credits: 3

Total: 15 credits

Seventh Semester

• 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
Total: 15 credits

Eighth Semester

- Technical elective Credits: 3
- Technical elective Credits: 3
- Arts course Credits: 3
- ECE 448 - FPGA and ASIC Design with VHDL Credits: 4
- ECE 493 - Senior Advanced Design Project II Credits: 2

Total: 15 credits

Change of Major

Students who want to change their majors to computer engineering or 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 completion of ECE 492 and 493, or BENG 492 and BENG 493, Senior Advanced Design Project I and II, in which various aspects of project documentation and reports are prepared and critiqued. The faculty provides feedback on student writing. Drafts and revisions are required.

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 ite.gmu.edu.

Electrical Engineering, BS

Banner Code: VS-BS-ELEN

School: The Volgenau School of Information Technology and Engineering

Department: Electrical and Computer 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, from 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 the Accreditation Board for Engineering and Technology, 111 Market Place, Suite 1050, Baltimore, Maryland 21202-4012; 410-347-7700. The electrical engineering program is staffed by 25 full-time professors, including five 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. 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, the Institute of Electrical and Electronics Engineers, and Rockwell International.

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 also are 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 and ENGR 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 electrical engineering are as follows:

**Electrical and computer engineering:**

- 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

Computer science:
- CS 112 - Introduction to Computer Programming Credits: 4
- CS 222 - Computer Programming for Engineers Credits: 3

Engineering:
- ENGR 107 - Introduction to Engineering Credits: 2

Literature general education course  Credits: 3
Arts general education course  Credits: 3
Global understanding course  Credits: 3

English:
- ENGL 101 - Composition Credits: 3
- ENGL 302 - Advanced Composition Credits: 3
- COMM 100 - Public Speaking Credits: 3

Economics:
- ECON 103 - Contemporary Microeconomic Principles Credits: 3

Western civilization (choose one):
- HIST 100 - History of Western Civilization Credits: 3
  OR
- HIST 125 - Introduction to World History Credits: 3

Mathematics:
- 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:
- 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

Note:
The general education synthesis requirement is satisfied by ECE 492 plus ECE 493 or by BENG 492 plus BENG 493. General education courses should be selected from the department’s list of approved courses. 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. Technical electives should be selected from the department’s list of approved courses. The required design content must be satisfied by the technical electives.
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 in Bioengineering (BIOE)

In place of 13 credits of PHYS 262, PHYS 263, ECE 460, ECE 492, ECE 493, and one 3-credit technical elective as listed under the Degree Requirements section above, take 13 credits of:

- BIOL 213 - Cell Structure and Function Credits: 4
- BENG 401 - Bioengineering Instrumentation and Design Credits: 4
- BENG 402 - Bioengineering Instrumentation and Design Laboratory Credits: 1
- BENG 492 - Senior Advanced Design Project I Credits: 2
- BENG 493 - Senior Advanced Design Project II Credits: 2

▲ 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)

- 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

  AND

- ECE 492 - Senior Advanced Design Project I Credits: 1
• ECE 493 - Senior Advanced Design Project II Credits: 2 (with an electronics topic)

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 513 - Applied Electromagnetic Theory Credits: 3
• 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

Sample Schedule

The following is a sample schedule that an undergraduate electrical engineering major would follow to obtain a bachelor’s degree.

First Semester

• CS 112 - Introduction to Computer Programming Credits: 4
• ECON 103 - Contemporary Microeconomic Principles Credits: 3
• ENGR 107 - Introduction to Engineering Credits: 2
• ENGL 101 - Composition Credits: 3
• MATH 113 - Analytic Geometry and Calculus I Credits: 4

Total: 16 credits

Second Semester

• 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

Total: 14 credits

Third Semester

• 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

Total: 16 credits

Fourth Semester

• 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

Total: 15 credits

Fifth Semester

• 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

Total: 17 credits

Sixth Semester
• 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

Total: 15 credits

Seventh Semester

• 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
• ENGL 302 - Advanced Composition Credits: 3

Total: 15 credits

Eighth Semester

• Advanced engineering lab  Credits: 1
• Technical elective  Credits: 3
• Technical elective  Credits: 3
• ECE 493 - Senior Advanced Design Project II Credits: 2
  AND, either
• HIST 100 - History of Western Civilization Credits: 3
  OR
• HIST 125 - Introduction to World History Credits: 3

Total: 12 credits

Change of Major

Students who want to change their majors to computer engineering or 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 completion of ECE 492 and 493, or BENG 492 and BENG 493, Senior Advanced Design Project I and II, in which various aspects of project documentation and reports are prepared and critiqued. The faculty provides feedback on student writing. Drafts and revisions are required.

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 ite.gmu.edu.

Bachelor's/Accelerated Master's Program

Computer Engineering, BS/Computer Engineering, Accelerated MS

School: The Volgenau School of Information Technology and 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 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.

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.
Electrical Engineering, BS/Electrical Engineering, Accelerated MS

School: The Volgenau School of Information Technology and 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 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.

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.

Master's Degree

Computer Engineering, MS

Banner Code: VS-MS-CPE

School: The Volgenau School of Information Technology and 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. The 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. The 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:

- CS 571 - Operating Systems Credits: 3
- ECE 511 - Microprocessors 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

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 must comprise courses from ECE and the Computer Science Departments.

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 includes faculty members from the ECE and the Computer Science Departments, including at least two affiliated with the MS in Computer Engineering Program, one of whom must be from ECE and one from outside the MS in Computer Engineering Program. 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: The Volgenau School of Information Technology and Engineering

Department: Electrical and Computer Engineering

Computer forensics is a new 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. In the last several years, with a proliferation of digital storage, transmission, and processing of sensitive information there has been an increase in cyber crime. 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 and 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 6 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 3.00 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):

- 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
- CFRS 660 - Network Forensics Credits: 3
- CFRS 661 - Digital Media Forensics Credits: 3
- CFRS 663 - Operations of Intrusion Detection for Forensics Credits: 3
- CFRS 760 - Legal and Ethical Issues in IT Credits: 3
- CFRS 770 - Fraud and Forensics in Accounting Credits: 3
- CFRS 790 - Advanced Computer Forensics Credits: 3

Elective courses (12 credits):

- CFRS 664 - Incident Response Forensics Credits: 3
- CFRS 760 - Legal and Ethical Issues in IT 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
- INFS 785 - Data Mining for Homeland Security 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.

### Electrical Engineering, MS

**Banner Code:** VS-MS-ELEN

**School:** The Volgenau School of Information Technology and Engineering

**Department:** Electrical and Computer Engineering

The electrical engineering program offers the following emphases: bioengineering, communications, signal processing, control and robotics, and microelectronics.

### 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 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:

- 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
• 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 includes faculty members from the ECE and the Computer Science Departments, including at least two affiliated with the MS in Computer Engineering Program, one of whom must be from ECE and one from outside the MS in Computer Engineering Program. 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: The Volgenau School of Information Technology and 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, law, business, international aspects, and other fields. 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 the theoretical approach. It focuses on the engineering and IT aspects of telecommunications, in combination with the interdisciplinary knowledge offered by selected courses in telecommunications law and policy. More than 30 new engineering and IT courses have been designed specially for this program, including five certificate programs that may be incorporated into, and taken concurrently with, the MS in telecommunications. Two of the certificates are at an advanced level: the telecommunications forensics and security certificate and the advanced networking protocols for telecommunications certificate.

A novelty of the program is its structure, which consists of five specialty modules corresponding to areas of emphasis. 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, ATM, 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, PCS, 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, capacity modeling, 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.
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 common with the former MA in telecommunications (PUBP 726, LAW 181, and TELE 750 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 five specialty modules (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 courses and specialty modules. The core consists of 15 credits, with the remaining 15 credits earned in specialty modules. The specialty modules are subareas of telecommunications that provide the necessary depth in the selected areas of emphasis.

Students are usually expected to take courses from at least two specialty modules. Up to 6 credits from the core program may be carried forward into the specialty modules, thus permitting up to 6 credits of electives to be taken inside or outside the prime specialty module chosen by the student. TCOM 501/502 may be carried forward into specialty module 1, 2, or 3; TCOM 521 may be carried forward into specialty module 4 or 5. Double counting is not permitted, but the courses carried forward into a given module may permit that module’s credit requirement to be satisfied, thus allowing elective courses to be taken outside that module. Usually, a minimum of 6 credits is needed to satisfy one specialty module. Credit for each specialty module 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 specialty 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 or B- grades may be carried within the program from the remaining core courses or from the specialty module 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:
Mandatory core 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):

- Law 181 Telecommunications Law and Regulation Credits: 3
  www.law.gmu.edu/academics/courses/law181
- 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 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 specialty modules:

Students usually take 15 credits from at least two of the five specialty modules, or they may elect to take all 15 credits from the systems engineering of telecommunications module (module 5). Students electing to carry forward a core course (TCOM 501/502 or TCOM 521) into an appropriate specialty module have the option of taking an elective course in that module or another module to bring the total number of credits in the specialty modules to 15.

A specialty module (group of courses in an area of emphasis) can be completed by a combination of full-semester courses and half-semester courses listed under the module or considered applicable to that module for a total of at least 6 credits in that module. Some specialty module courses are in more than one module; for example, TCOM 509 Internet Protocols is in module 1, network technologies, and module 2, network applications. Half-semester 1.5-credit courses may only be counted in one module,
even if they apply to more than one. Full-semester 3-credit courses may be counted in one module or split between two modules. For example, TCOM 551 Digital Communication Systems, which is in modules 1 and 3, may be counted as 3 credits in either module, or 1.5 credits in each module.

Basic courses in each module 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 specialty module 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 modules. 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 modules 4 and 5 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 module (module 5) should the student elect to take all 15 credits in this specialty module. Students taking only 7.5 credits in modules 4 or 5 have the option of taking TCOM 699, but the course is not required unless the student takes all 15 credits in module 5.

List of Specialty Modules

Courses listed below from other graduate programs in the Volgenau School listed below 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.

Module 1, Network Technologies

- TCOM 503 - Fiber Optic Communications Credits: 1.5
- 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 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 - Applied Cryptography 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
Module 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 541 - Network Design and Pricing 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 - Applied Cryptography Credits: 1.5
- TCOM 562 - Network Security Fundamentals Credits: 3
- TCOM 603 - Standards for Advanced Optical Networks 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

Module 3, Wireless Communications

- TCOM 506 - Personal Communication Systems (PCS) Credits: 1.5
- TCOM 516 - Global Positioning System (GPS) Credits: 1.5
- TCOM 517 - Introduction to Propagation Effects Credits: 1.5
- TCOM 518 - Third Generation Cellular Telephony Credits: 1.5
- TCOM 526 - Advanced Global Positioning System (GPS) Credits: 1.5
- TCOM 551 - Digital Communication Systems Credits: 3
Module 4, Modeling of Telecommunications Systems

- TCOM 541 - Network Design and Pricing Credits: 1.5
- TCOM 542 - Stochastic Models in Telecommunications Credits: 1.5
- TCOM 545 - Reliability and Maintainability of Networks Credits: 3
- TCOM 546 - Financial Models of Telecommunications Systems Credits: 3
- TCOM 547 - Project Management in Telecommunications Credits: 3
- TCOM 548 - Security and Privacy Issues in Telecommunications Credits: 1.5
- TCOM 562 - Network Security Fundamentals Credits: 3
- TCOM 699 - Telecommunications Project Course Credits: 3
- OR 641 - Linear Programming Credits: 3
- OR 642 - Integer Programming Credits: 3
- OR 644 - Nonlinear Programming Credits: 3

Module 5, Systems Engineering of Telecommunications

This module can be taken as one of two specialty modules or as one 15-credit module. No more than two SYST courses can be taken within this module.

- TCOM 520 - Economics of Telecommunications Credits: 3
- TCOM 546 - Financial Models of Telecommunications Systems 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

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
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
Telecommunications Forensics and Security Graduate Certificate
Telecommunications Systems Modeling Graduate Certificate
Wireless Communications Graduate Certificate

Master's Level Certificate

Advanced Networking Protocols for Telecommunications Graduate Certificate

Banner Code: VS-CERG-ANPT

College: The Volgenau School of Information Technology and Engineering

Department: Electrical and Computer Engineering

This certificate provides an in-depth understanding of advanced protocols used in a variety of telecommunications networks.

Certificate Requirements

To obtain the certificate, students must complete the following for a total of 15 credits:
Core Courses

Choose 9 credits 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 609 - Interior Gateway Protocol (IGP) Routing Credits: 3
- TCOM 610 - Border Gateway Protocol (BGP) Routing Credits: 3

Elective Courses

Choose 6 credits from 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.

Communications and Networking Graduate Certificate

Banner Code: VS-CERG-CONE

School: The Volgenau School of Information Technology and 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 target for students who want to advance their knowledge 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.

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
  or
- 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
- ECE 565 - Introduction to Optical Electronics Credits: 3
- ECE 567 - Optical Fiber Communications Credits: 3
- ECE 630 - Statistical Communication Theory Credits: 3
- ECE 633 - Coding Theory Credits: 3
- ECE 635 - Adaptive Signal Processing Credits: 3
- ECE 642 - Design and Analysis of Computer Communication Networks Credits: 3
- ECE 643 - Switching and Routing in Communication Networks Credits: 3
- ECE 646 - Cryptography and Computer Network Security Credits: 3
- ECE 665 - Fourier Optics and Holography Credits: 3
- ECE 731 - Digital Communications Credits: 3
- ECE 732 - Mobile Communication Systems Credits: 3
- ECE 734 - Detection and Estimation Theory Credits: 3
- ECE 735 - Data Compression Credits: 3
- ECE 737 - Spread Spectrum Communications Credits: 3
- ECE 738 - Advanced Digital Signal Processing Credits: 3
- ECE 739 - Satellite Communications Credits: 3
- ECE 741 - Wireless Networks Credits: 3
- ECE 742 - High-Speed Networks Credits: 3
- IT 834 - Telecommunications Networks Credits: 3
- IT 886 - Information Theory Credits: 3
- OR 635 - Discrete System Simulation Credits: 3
- OR 643 - Network Modeling Credits: 3
- OR 647 - Queuing Theory Credits: 3
The certificate provides a broad understanding of the technologies used in telecommunications networks and the various applications of telecommunications networks. 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
- TCOM 529 - Advanced Internet Protocols Credits: 1.5
- TCOM 539 - Advanced Voice over IP Credits: 1.5
- TCOM 555 - Network Management Foundations and Applications Credits: 3

**Elective Requirements**

Six credits are required. Students may elect to take any additional 6 credits from the Telecommunications MS specialty modules 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.

**Networks, System Integration and Testing Graduate Certificate**

**Banner Code: VS-CERG-NSIT**

School: The Volgenau School of Information Technology and 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.

**Admission 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

- ECE 675 - System Integration and Architecture Evaluation Credits: 3
  or
- ECE 525 - Hardware/Software Integration Credits: 3
- SWE 637 - Software Testing Credits: 3

Signal Processing Graduate Certificate

Banner Code: VS-CERG-SIGP

School: The Volgenau School of Information Technology and 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 target 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.

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
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
- IT 841 - Kalman Filtering with Applications Credits: 3
- ECE 728 - Random Processes in Electrical and Computer Engineering Credits: 3
- ECE 734 - Detection and Estimation Theory Credits: 3
  or
- IT 830 - Detection and Estimation Theory Credits: 3
- ECE 735 - Data Compression Credits: 3
  or
- IT 832 - Data Compression Credits: 3
- ECE 738 - Advanced Digital Signal Processing Credits: 3
- ECE 751 - Information Theory Credits: 3
  or
- IT 886 - Information Theory Credits: 3
- ECE 752 - Spectral Estimation Credits: 3
  or
- IT 885 - Spectral Estimation Credits: 3
- ECE 754 - Optimum Array Processing I Credits: 3
  or
- IT 837 - Optimum Array Processing I Credits: 3
- ECE 755 - Optimum Array Processing II Credits: 3
  or
- IT 937 - Optimum Array Processing II Credits: 3
• IT 838 - Signal Processing Algorithms and Architectures Credits: 3
• IT 844 - Advanced Pattern Recognition Credits: 3
• ECE 749 - Neural Networks for Control Credits: 3
• CS 775 - Advanced Pattern Recognition Credits: 3
• IT 978 - Statistical Analysis of Signals Credits: 3
• CSI 978 - Statistical Analysis of Signals Credits: 3
• STAT 652 - Statistical Inference Credits: 3
• CSI 672 - Statistical Inference Credits: 3
• STAT 658 - Time Series Analysis and Forecasting Credits: 3
• CSI 678 - Times Series Analysis and Forecasting Credits: 3

Telecommunications Forensics and Security Graduate Certificate

Banner Code: VS-CERG-TFAS

School: The Volgenau School of Information Technology and 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.

Certificate Requirements

Students must complete the following for a total of 15 credits:

Core Courses

Choose 9 credits from the following:

• TCOM 548 - Security and Privacy Issues in Telecommunications Credits: 1.5
  and
• TCOM 556 - Applied Cryptography Credits: 1.5
  or
• TCOM 515 - Internet Protocol Routing: Lecture and Laboratory Course Credits: 3
• TCOM 562 - Network Security Fundamentals Credits: 3
  or
• ISA 562 - Information Security Theory and Practice 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.

Telecommunications Systems Modeling Graduate Certificate

Banner Code: VS-CERG-TESM

School: The Volgenau School of Information Technology and Engineering

Department: Electrical and Computer Engineering

This certificate provides a broad understanding of the end to end systems engineering approach to telecommunications projects.

Certificate Requirements

Students must complete the following, for a total of 15 credits:

Core Courses

Choose 9 credits from the following:

- TCOM 521 - Systems Engineering for Telecommunications Management Credits: 3
- TCOM 541 - Network Design and Pricing Credits: 1.5
Elective Courses

- Six credits are required. Students may earn the credits from the Telecommunications MS specialty modules 4 and 5, including those in the mandatory course list that are not part of the 9 credits of core courses for the certificate.

VLSI Design/Manufacturing Graduate Certificate

Banner Code: VS-CERG-VLSE

School: The Volgenau School of Information Technology and Engineering

Department: Electrical and Computer Engineering

This certificate’s primary purpose is to provide a well-targeted graduate continuing education opportunity for people working in Northern Virginia’s semiconductor and intellectual property industry. This certificate is intended for students who want to advance their knowledge of very large scale integration (VLSI) design or manufacturing, but who do not necessarily wish to complete requirements for the MS in electrical engineering or computer engineering. The course work is designed so that graduate students can reach a demonstrated level of competence in VLSI design or VLSI manufacturing. Course work toward the graduate certificate may be used for credit toward the MS in electrical engineering or computer engineering. The certificate may be pursued concurrently with any of the graduate degree programs in the Volgenau School.

Admission Requirements

The program is open to all students who hold a BS degree in scientific and engineering disciplines and hold graduate student status (degree or non-degree) in the Volgenau School. Students with nonscientific and nonengineering degrees are required to take remedial courses before being admitted into the certificate program.

Certificate Requirements

The certificate is awarded on completion of five graduate courses (15 credits): a required foundation course, a compulsory core course, and three electives. A cumulative GPA of 3.00 is required, and only one course with a grade of C may be applied toward the certificate. At most, one course may be transferred from graduate course work completed at another accredited university.

After completing the foundation course (ECE 684), students choose one of the two emphases, VLSI design or VLSI manufacturing, by taking four courses in that emphasis, one of which will be the core course in that area.

Foundation course (3 credits):

- ECE 684 - MOS Device Electronics Credits: 3

VLSI Design Emphasis (12 credits):

Core course:
Electives

Take 9 credits from the following:

- ECE 545 - Digital System Design with VHDL Credits: 3
- ECE 587 - Design of Analog Integrated Circuits Credits: 3
- ECE 645 - Computer Arithmetic Credits: 3
- ECE 680 - Physical VLSI Design Credits: 3
- ECE 681 - VLSI Design for ASICs Credits: 3
- ECE 682 - VLSI Test Concepts Credits: 3

VLSI Manufacturing Emphasis (12 credits):

Core course:

- ECE 689 - VLSI Processing Credits: 3

Electives

- ECE 586 - Digital Integrated Circuits Credits: 3
- ECE 680 - Physical VLSI Design Credits: 3
- ECE 745 - ULSI Microelectronics Credits: 3

Wireless Communications Graduate Certificate

Banner Code: VS-CERG-WIRE

School: The Volgenau School of Information Technology and 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.

Certificate Requirements

Students must complete the following, for a total of 15 credits:

Core Courses

Choose 9 credits from the following:
Elective Courses

- Six credits are required. Students may earn the credits from the Telecommunications MS specialty modules 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.

Doctoral Degree

Electrical and Computer Engineering, PhD

Banner Code: VS-PHD-ECE

School: The Volgenau School of Information Technology and Engineering

Department: Electrical and Computer Engineering

This program, offered by ECE, is the only combined electrical engineering and computer engineering doctoral program in Virginia. The program prepares students for leadership positions in research and development in industrial, government, and academic settings. It includes course requirements; a qualifying exam testing fundamental concepts and the ability to think creatively; a teaching requirement; a research competency exam; and dissertation proposal defense, dissertation research, and dissertation defense. Students may choose an emphasis such as communications, networking, computer engineering, control and robotics, signal processing, microelectronics or nanoelectronics. These emphasis areas may include biological or medical applications. Mason’s general doctoral requirements apply to this program.

Admission Requirements

All general Mason and specific Volgenau School admission requirements apply. In addition, all applicants, including Mason undergraduates, must submit official transcripts (undergraduate and graduate) and official results of the GRE General Test. Applicants whose native language is not English must submit official TOEFL results showing a minimum 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. Students typically admitted to the program hold MS degrees in electrical engineering, computer engineering, and other related areas. Students holding European (or equivalent) diploma degrees may also be considered for admission. The application material for each student is reviewed by the department doctoral committee, which makes a recommendation to the department chair.

Advisor and Dissertation Director

On admission to the program, each student is assigned a faculty member as advisor. On passing the qualifying exam, the advisor is replaced by or becomes the dissertation director. All decisions concerning the student’s course requirements and selections must be approved by the PhD advisor with the consent of the ECE Department chair.
A dissertation committee is 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. The composition of the dissertation committee must be approved by the ECE Department chair.

Course Requirements

After the BS degree, 72 credits are required; dissertation research is usually 24 credits. Students entering with an MS degree may use up to 30 credits of course work from their MS program, subject to approval. Students entering with European diploma degrees may use some course credit, subject to individual consideration, but not more than 30 credits.

Of the required course work, a maximum of 6 credits may be at the 500 level and at least 9 credits must be at the 700 level or higher. For courses taken elsewhere, the equivalent levels are to be determined by the PhD advisor, subject to approval by the ECE Department chair. Individualized reading courses at any level cannot account for more than 6 credits.

ECE 798 Research Project is primarily an MS course and is not intended to be part of the PhD course work. Research in the PhD program should be included in ECE 998 and ECE 999 courses.

Students are required to take one graduate course (3 credits) at the 600 level outside the department in a subject considered foundational for their area of emphasis. Typical examples are advanced mathematics or statistics courses for those pursuing an emphasis in signal processing or control, physics courses for those desiring an emphasis in electronics, and computer science courses for those pursuing the computer engineering emphasis. Because such courses are usually not taken for MS degrees, this requirement can rarely be satisfied with a course taken previously.

Students are required to take two courses (6 credits) within the department but outside their area of emphasis. This requirement may be satisfied with courses taken during previous studies, subject to approval. Candidates must complete a minimum of 12 credits of doctoral proposal (ECE 998) and doctoral dissertation research (ECE 999). A maximum of 24 credits of ECE 998 and ECE 999 may be applied to the degree. At least half of the total of ECE 998 and ECE 999 credits must come from ECE 999. 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 their research proposal is accepted and approved by the dissertation committee.

Qualifying Exam

The department offers a doctoral qualifying exam once each year. The exam is primarily for testing the student’s familiarity with fundamental concepts and the ability to think creatively. Students must take the exam within the first year after they have entered the program with an MS degree, typically in late August, prior to the start of the Fall semester.

Students who enter with a BS degree must take the exam within the first year after they have completed 24 credits beyond the BS degree. The qualifier consists of a written in-class exam and an oral interview. Students must select one area from the list below for their qualifying exam. The qualifying exam may be repeated once. A student failing the exam twice is removed from the program. The qualifying exam is not tied to any particular course. It is offered in the following areas, and each area consists of four subjects:

- Area A: Communications, Controls, and Signal Processing
- Area B: Computer Engineering
- Area C: Electronics and Devices

The written exam consists of two problems in each subject. Students must solve five problems from no more than three subjects in their selected area. Subject to ECE Department approval, students with a non-ECE background may substitute one subject compatible with their background and relevant to their planned research in the ECE PhD program. Information technology PhD transfer students are required to take the ECE qualifying exam.
Teaching Requirement

To acquire lecturing and teaching experience, each doctoral student is required to participate in the department’s teaching activity. This typically takes the form of working as a recitation instructor. The minimum requirement is one full semester of such activity in one course or equivalent arrangements approved by the doctoral coordinator.

Research Competency Exam, Dissertation Proposal, Advancement to Candidacy

On completing all course work requirements, students take an oral research competency exam to demonstrate their preparation for dissertation research. The exam comprises a presentation of the research dissertation proposal and competency in the knowledge derived from higher-level courses relevant to the student’s research and familiarity with technical literature. The exam is administered by the student’s dissertation committee.

The student prepares a written dissertation proposal outlining the contents of the dissertation and the research activities leading up to it. The dissertation proposal is submitted to the dissertation committee for approval. The proposal is orally presented as part of the research competency exam. Upon passing this exam, the student is advanced to candidacy.

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 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, a public defense is administered by the dissertation committee, which may be preceded by a predefense in the presence of the committee members only at the committee’s discretion. 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.

Interdisciplinary Programs (VSITE)

School: The Volgenau School of Information Technology and 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.

Professional Degree
Information Technology Engineer Degree

Banner Code: VS-ENGR-INFT

School: The Volgenau School of Information Technology and 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 for research and graduate studies 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.

Students may waive up to 6 credits of course work by passing two of the qualifying exams (3 credits for each exam) from any of the PhD programs offered by the Volgenau School. 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 any INFS 500-level courses; IT 500 and 599; OR 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 meet format guidelines specified by the *Guide for Preparing Graduate Theses, Dissertations, and Projects* 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 accept the candidate for the engineer degree.

**Applying and Completing a PhD Program**

Students who are awarded an engineer degree are able, at a later date, to work toward a PhD in information technology. Some restrictions and limitations apply. After applying and being accepted into the PhD in Information Technology Program, students will be able to apply for a reduction of up to 12 credits in course requirements. The request must satisfy the rules for transfer credit at Mason, and courses must be relevant to the student’s planned dissertation research. In addition, the qualifying exams for the doctoral program will be waived for such students. All other requirements for the doctoral program must be satisfied.

**Doctoral Degree**

**Information Technology, PhD**

*Banner Code: VS-PHD-INFT*

*School: The Volgenau School of Information Technology and Engineering*

*Department: Interdisciplinary Programs*

The general doctoral requirements of Mason apply to this program.

When the term “information technology (IT) and engineering” is used at Mason to describe the school and its activities, 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.

**Course Work**

The PhD in Information Technology Program offers courses designated IT in the Course Descriptions section of this catalog.

**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, statistics, mathematics, physical sciences, economics, and psychology, is required for admission to the program.

In addition, well-qualified students without an appropriate master’s degree may apply directly to the PhD program. Such students will have to complete the equivalent of an appropriate Mason master’s degree as part of their program of study. In some cases, it may be possible to obtain transfer credit for graduate course work taken elsewhere, subject to meeting requirements for transfer credit imposed by the university. (The description here assumes that a student has already received an appropriate master’s degree.)

An undergraduate GPA of 3.00 and a graduate GPA of 3.50 scale 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 when available or if required by the specific concentration, three letters of reference, a résumé, a short 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. An applicant’s entire background is examined before an admission decision is made.

Students who wish to be considered for Mason’s President Scholarship, which provides a stipend and tuition support for three years, must submit GRE scores with a score of at least 1,200 with their application. One President 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 course work 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 course work may be admitted and then required to take appropriate articulation courses.

**Plan of Study**

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. Generally, students have already obtained a master’s degree in a field appropriate to IT, which prepares them for the qualifying exams.

Under the guidance of the doctoral supervisory committee, students prepare a tentative plan of study. The plan lists the intended courses and expected timing. The plan should also contain the intended dates of the qualifying and comprehensive exams, and a tentative subject of the dissertation research.

**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. 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 the supervisor 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, unless fewer than 24 credits of course work have been completed in that time. Otherwise, the exams must be taken no later than the first opportunity after completion of 24 credits. 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.

**Advanced Emphasis Requirement**

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 doctoral supervisory committee and the Volgenau School senior associate dean for graduate studies and research must approve the plan of study. These approvals must occur before a student completes courses in the area of concentration or specialization. There is no guarantee that courses taken before this approval will be accepted.

Students must take a set of 24 credits of graduate-level course work independent of the qualifying exams they take. That is, if a student takes a qualifying exam related to OR 541, then OR 541 cannot be counted as 3 credits of specialty course work. A GPA of 3.50 is required in these 24 credits. The plan of study may include a maximum of 3 credits of directed reading course work. At least 12 of the 24 credits must be in courses numbered 700 or higher, and these 12 credits cannot include directed reading, project, or thesis courses.

The following courses cannot be included in any plan of study: any INFS 500-level courses; IT 500 and 599; OR 540; and SYST 500. Exceptions must be approved in advance by the senior associate dean.

Each PhD student is allowed to designate an emphasis from among the titles of the MS degree programs offered by the Volgenau School. For more information, see department sections.

**Doctoral Supervisory Committee**

On admission to the program, students are assigned a temporary advisor. Students are responsible for working with the temporary advisor until they choose a dissertation director and an advisory committee. Students should make this selection as soon after admission as possible. This is especially important for students who have completed a considerable amount of graduate work elsewhere.

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.
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 Examination

The comprehensive exam is an oral exam taken after students have satisfactorily completed all course work 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 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 exam 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 course work 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 dismissed 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 course work, 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 & Final Defense

With the concurrence of the advisory committee, students proceed with the doctoral research, during which time they must be continuously enrolled in IT 999 Doctoral Dissertation. Students must complete a minimum of 24 credits from among IT 990, 998, and 999, with a minimum of 12 credits of IT 999. 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 supervisory 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 supervisory 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 defense 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 dismissed from the program.

Concentrations

Choosing a concentration narrows program flexibility, so it is not necessary to choose a concentration. In particular, a concentration may be inappropriate for students doing interdisciplinary research. Students who do declare a concentration will have the concentration noted on their transcript.

▲ Concentration in Civil and Infrastructure Engineering (CEIE)

Students who pursue a concentration in this doctoral program will have the concentration noted on their transcript. The degree conferred on a graduating student is a PhD in information technology with a concentration in civil and infrastructure engineering. Students may also pursue such doctoral studies without designating a concentration.

Requirements

Students seeking this concentration must satisfy all the requirements for the PhD in information technology degree. In addition, the following requirements must be met:

Plan of Study

All decisions concerning the student’s course requirements and plan of study must be approved by the advisor or director, with the consent of the CEIE Department chair.

Doctoral Supervisory Committee

The dissertation director must be a CEIE Department faculty member. The composition of the doctoral supervisory committee is to be approved by the CEIE Department chair and the Volgenau School associate dean for research and graduate studies. Permission for the comprehensive exam and the dissertation defense is requested from the Volgenau School associate dean on the basis of a written request and plan approved by the supervisory committee and the CEIE Department chair.

▲ Concentration in Information Security and Assurance (ISA)
Students who pursue a concentration in this doctoral program will have the concentration noted on their transcript. The degree conferred on a graduating student is the PhD in information technology with concentration in information security. Students may also pursue such doctoral studies without designating a concentration.

Requirements

Students seeking this concentration must satisfy all requirements for the PhD in information technology. In addition, the following requirements must be met:

Plan of Study

All decisions concerning the student’s course requirements and plan of study must be approved by the advisor or director, with the consent of Computer Science doctoral coordinator.

Doctoral Supervisory Committee

The dissertation director must be a faculty member of the Volgenau School. The composition of the doctoral supervisory committee is to be approved by the Computer Science doctoral coordinator and department chair, and the Volgenau School associate dean for research and graduate studies. Permission for the comprehensive exam and dissertation defense is requested from the Volgenau School associate dean on the basis of a written request and plan that has been approved by the supervisory committee and the Computer Science doctoral coordinator.

For information regarding qualifying exams and emphasis areas, please consult the department web site.

▲Concentration in Information Systems (ISYS)

Students who pursue a concentration in this doctoral program will have the concentration noted on their transcript. The degree conferred on a graduating student is the PhD in information technology with concentration in information systems. Students may also pursue such doctoral studies without designating a concentration.

Requirements

Students seeking this concentration must satisfy all the requirements for the PhD in information technology. In addition, the following requirements must be met:

Plan of Study

All decisions concerning the student’s course requirements and plan of study must be approved by the advisor or director, with the consent of the Computer Science doctoral coordinator.

Doctoral Supervisory Committee

The dissertation director must be a Computer Science faculty member. The composition of the doctoral supervisory committee must be approved by the Computer Science doctoral coordinator, the Computer Science chair, and the Volgenau School associate dean for research and graduate studies. Permission for the comprehensive exam and dissertation defense is requested from the Volgenau School associate dean on the basis of a written request and plan approved by the supervisory committee and the Computer Science doctoral coordinator.

For information regarding qualifying exams and emphasis areas, please consult the department web site.
Concentration in Software Engineering (SWE)

Students who pursue a concentration in this doctoral program will have the concentration noted on their transcript. The degree conferred on a graduating student is the PhD in information technology with concentration in software engineering. Students may also pursue such doctoral studies without designating a concentration.

Requirements

Students seeking this concentration must satisfy all requirements for the PhD in information technology. In addition, the following requirements must be met:

Plan of Study

All decisions concerning the student’s course requirements and plan of study must be approved by the advisor or director, with the consent of the Computer Science doctoral coordinator.

Doctoral Supervisory Committee

The dissertation director must be a faculty member of the Computer Science Department. The composition of the doctoral supervisory committee is to be approved by the Computer Science doctoral coordinator, the Computer Science chair, and the Volgenau School associate dean for research and graduate studies. Permission for the comprehensive exam and dissertation defense is requested from the Volgenau School associate dean on the basis of a written request and plan that has been approved by the supervisory committee and the Computer Science doctoral coordinator.

For information regarding qualifying exams and emphasis areas, please consult the department web site.

Statistics

Phone: 703-993-3645
Web: statistics.gmu.edu

School: The Volgenau School of Information Technology and Engineering

Faculty

Professors: Carr, Gentle, Rosenberger (chair), Wegman

Associate professors: Bell, Davis (associate chair), Miller, C. Sutton

Assistant professors: Diao, Tang

Instructors: Sims (visiting), 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 an undergraduate certificate program in applied statistics and a minor in data analysis. Also, a variety of advanced undergraduate courses is available for inclusion in other degree programs.

**Bachelor's Level Certificate**

**Applied Statistics Undergraduate Certificate**

**Banner Code: VS-CERP-ASTA**

**School: The Volgenau School of Information Technology and Engineering**

**Department: Statistics**

This program complements undergraduate degree programs in computer science, systems engineering, electrical engineering, civil and infrastructure engineering, and mathematics. Undergraduates majoring in other discipline areas may be admitted to the certificate program at the discretion of the department.

The program expands career options available to students because the demand is great in the Washington, D.C., metropolitan area for people with interdisciplinary training, which includes a background in statistics and data analysis. Inquiries should be directed to the Statistics Department. Students who plan to work toward the certificate should seek advice from the department’s undergraduate coordinator.

**Certificate Requirements**

The certificate program requires 24 credits: 12 credits of certificate courses plus 12 credits of electives.

**Certificate Courses (12 credits)**

- STAT 344 - Probability and Statistics for Engineers and Scientists I Credits: 3
- STAT 346 - Probability for Engineers Credits: 3
- STAT 354 - Probability and Statistics for Engineers and Scientists II Credits: 3
- STAT 362 - Introduction to Computer Statistical Packages Credits: 3
Elective Courses (12 credits)

Choose 12 credits from the following courses:

- 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 498 - Independent Study in Statistics Credits: 1-3
- STAT 499 - Special Topics in Statistics Credits: 3
- ECON 445 - Design and Analysis of Experiments Credits: 3
- OR 335 - Discrete Systems Simulation Modeling Credits: 3 (or crosslisted course SYST 335)
- OR 441 - Deterministic Operations Research Credits: 3 (or crosslisted course MATH 441)
- OR 442 - Stochastic Operations Research Credits: 3 (or crosslisted course MATH 442)
- OR 481 - Numerical Methods in Engineering Credits: 3 (or crosslisted course MATH 446)
- SYST 473 - Decision and Risk Analysis Credits: 3

Undergraduate Minor

Data Analysis Minor

School: The Volgenau School of Information Technology and 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, 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 with grades of C or better:

- 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
- CEIE 410 - Geographic Information Systems in Engineering Credits: 3
- CS 450 - Database Concepts Credits: 3
- ECON 445 - Design and Analysis of Experiments Credits: 3
- GEOG 300 - Quantitative Methods for Geographical Analysis Credits: 3
- GOVT 400 - Political Research and Data Analysis Credits: 3
- OR 335 - Discrete Systems Simulation Modeling Credits: 3 (or crosslisted course SYST 335)
- SOCI 405 - Analysis of Social Data Credits: 4
- SYST 473 - Decision and Risk Analysis Credits: 3

Bachelor's/Accelerated Master's Program

BS/Statistical Science, Accelerated MS

School: The Volgenau School of Information Technology and 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 suitable Mason BS program 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

Epidemiology and Biostatistics, MS (VSITE)

Banner Code: HH-MS-EBST

School: The Volgenau School of Information Technology and Engineering

Department: Statistics

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 government agencies, such as the National Institutes of Health, 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. The degree is taught jointly by faculty from the Department of Statistics in The Volgenau School of Information Technology and Engineering and the Department of Global and Community Health in the College of Health and Human Services.

Admission Requirements

Applicants must hold a baccalaureate degree in a discipline related to health science or statistics, with a minimum GPA of 3.0 in the last 60 credits. Courses in calculus at the undergraduate level through multivariate calculus equivalent to Math 113, 114, and 213 with a grade of B or better are required for admission to the program. Some background in statistics and biology is preferred. Applications to the degree program are made through the College of Health and Human Services. Admission decisions are made by a joint faculty committee from the Department of Statistics and the Department of Global and Community Health.

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 3.00 GPA to graduate.

Core Requirements (15 credits)

- GCH 712 - Introduction to Epidemiology Credits: 3
- GCH 722 - Infectious Disease Epidemiology Credits: 3
- GCH 732 - Chronic Disease Epidemiology Credits: 3
- STAT 554 - Applied Statistics Credits: 3
- STAT 660 - Biostatistical Methods Credits: 3

Epidemiology Electives (6 credits)

Select a minimum of two courses from the following:

- GCH 551 - Research Methods in Rehabilitation Science Credits: 3
- GCH 605 - Social Epidemiology Credits: 3
- GCH 680 - International Research Ethics and Methods Credits: 3
- GCH 726 - Advanced Seminar in Epidemiology Credits: 3
- GCH 752 - Nutritional Epidemiology Credits: 3

Statistics Electives (9 credits)

Select a minimum of three courses from the following:

- STAT 544 - Applied Probability Credits: 3
- STAT 574 - Survey Sampling I Credits: 3
- 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 665 - Categorical Data Analysis Credits: 3
- STAT 668 - Survival Analysis Credits: 3
- STAT 673 - Statistical Methods for Longitudinal Data Analysis Credits: 3

Additional Elective Courses (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.

Statistical Science, MS

Banner Code: VS-MS-STAT

School: The Volgenau School of Information Technology and Engineering

Department: Statistics

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.
The MS program offers a choice of the following emphasis areas: applied statistics, biostatistics, computational statistics, engineering statistics, federal statistics, and statistical signal processing. Students may select one of these emphases or design a customized curriculum in conjunction with a faculty advisor. Students also select the research or the professional option. The research option is for students planning to continue with a PhD degree or begin or continue careers in statistical methodology research. 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.

Admission Requirements

In addition to satisfying general admission requirements for graduate study, all applicants must demonstrate basic computer literacy. They also must hold a bachelor’s degree from an accredited institution in a field that includes course work in calculus or real analysis, matrix or linear algebra, and calculus-based probability and statistics. Applicants with degrees in such fields as mathematics, computer science, statistics, and engineering 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 322; and STAT 346 or MATH 351. Course work taken to correct deficiencies in undergraduate preparation is not counted toward the degree.

While the GRE is not required for admission, it is recommended for students competing for graduate teaching assistantships, fellowships, and research assistantships. International students from non-English-speaking countries who seek a graduate teaching assistantship should take the Test of Spoken English in addition to the TOEFL, which is required for admission.

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 emphasis area 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.

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 emphasis area 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 write a master’s essay. This piece is not an original research report but a scholarly essay on a topic of current interest in the statistical science discipline. The essay 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 essay 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 essay to develop their skills in preparing reports on technical subjects. The essay is usually written in the context of 3 credits of STAT 798 Master’s Essay, which count as elective credits. Students opting not to write an essay 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 emphasis area credits.
In addition to satisfying general university requirements for a master’s degree, candidates with the research option must submit a thesis or report 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 or report 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 course work 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

**Emphasis Area Courses (12 credits)**

Emphasis area courses may be chosen from any of the remaining 600-level graduate STAT courses except 645, 664, 677, and 678. In addition, STAT 574, 751, 758, and 760 may be chosen as emphasis area courses.

**Elective Courses (6 credits)**

Elective courses may be chosen from any graduate STAT courses except STAT 535, 700, 701, and STAT courses numbered 876 or higher. STAT 779 and 789 may be repeated for credit with prior written approval from the department’s graduate coordinator. Also, certain courses from other departments may be used as elective credits in a customized curriculum designed in conjunction with a faculty advisor and approved in writing by the department’s graduate coordinator. Customized curriculum must be submitted and approved no later than the end of the semester in which 15 credits have been completed.

**Suggested Programs of Study**

Following are some emphasis area and elective courses students might consider taking depending on their particular area of interests. 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 574 - Survey Sampling I Credits: 3
- STAT 655 - Analysis of Variance Credits: 3
- STAT 660 - Biostatistical Methods Credits: 3
- STAT 662 - Multivariate Statistical Methods Credits: 3
- STAT 664 - Bayesian Inference and Decision Theory Credits: 3
- STAT 665 - Categorical Data Analysis Credits: 3

Biostatistics:
- STAT 660 - Biostatistical Methods Credits: 3
- STAT 665 - Categorical Data Analysis Credits: 3
- STAT 668 - Survival Analysis Credits: 3
- STAT 673 - Statistical Methods for Longitudinal Data Analysis Credits: 3
- STAT 760 - Advanced Biostatistical Methods Credits: 3

Computational Statistics:
- STAT 657 - Nonparametric Statistics Credits: 3
- STAT 663 - Statistical Graphics and Data Exploration Credits: 3
- STAT 751 - Computational Statistics Credits: 3
- STAT 875 - Scientific and Statistical Visualization Credits: 3
- CS 652 - Computer Graphics 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 758 - Advanced Time Series Analysis Credits: 3
- OR 635 - Discrete System Simulation Credits: 3

Federal Statistics:
- STAT 574 - Survey Sampling I Credits: 3
- STAT 634 - Case Studies in Data Analysis Credits: 3
- STAT 660 - Biostatistical Methods Credits: 3
- STAT 663 - Statistical Graphics and Data Exploration Credits: 3
- STAT 665 - Categorical Data Analysis Credits: 3
- STAT 673 - Statistical Methods for Longitudinal Data Analysis Credits: 3
- STAT 674 - Survey Sampling II Credits: 3

Statistical Signal Processing:
- STAT 658 - Time Series Analysis and Forecasting Credits: 3
- STAT 662 - Multivariate Statistical Methods Credits: 3
- STAT 758 - Advanced Time Series Analysis Credits: 3
• ECE 535 - Digital Signal Processing Credits: 3
• ECE 630 - Statistical Communication Theory Credits: 3

Note:
A student concurrently enrolled in the Certificate in Actuarial Sciences Program and the MS in Statistical Sciences Program may count MATH 555 and 556 as approved elective courses and may count MATH 653 and 654 as emphasis area courses when designing a curriculum for the MS in Statistical Science. Credit toward the MS in Statistical Sciences 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 Sciences. Otherwise, at most two of MATH 555, 556, 653, and 654 can be counted toward the MS in Statistical Sciences as elective courses; none can be applied as emphasis area courses.

Dual Master’s

Mathematics and Statistical Science Dual-Degree MS

Banner Codes: SC-MS-MATH, VS-MS-STAT

School: The Volgenau School of Information Technology and Engineering

Department: 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 MS in Mathematics Program and the MS in Statistical Science Program. A joint faculty committee from the Mathematical Sciences and Statistics 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:

• MATH 621 - Algebra I Credits: 3
• MATH 675 - Linear Analysis I Credits: 3
• MATH 677 - Ordinary Differential Equations Credits: 3
  OR
• MATH 678 - Partial Differential Equations Credits: 3
• MATH 685 - Numerical Analysis Credits: 3
• STAT 544 - Applied Probability Credits: 3
• STAT 554 - Applied Statistics Credits: 3
• STAT 652 - Statistical Inference 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 STAT courses numbered 574 or higher, excluding STAT 700, 701, and 799. Courses must be approved in advance by the student's statistics academic advisor and the statistics graduate coordinator.

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.

Operations Research and Statistical Science Dual-Degree MS (STAT)

Banner Codes: VS-MS-OPRS, VS-MS-STAT

School: The Volgenau School of Information Technology and 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 680 - Project Course in Operations Research Credits: 3
- STAT 544 - Applied Probability Credits: 3
- STAT 554 - Applied Statistics 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 648 - Production and Inventory Systems Credits: 3
- OR 675 - Reliability Analysis Credits: 3
- OR 677 - Statistical Process Control Credits: 3

Elective Credits in STAT Courses

12 elective credits in STAT courses numbered 574 or higher, excluding STAT 700 and 701. 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.

**Master's Level Certificate**

**Biostatistics Graduate Certificate (VSITE)**

Banner Code: VS-CERG-BSTA
School: The Volgenau School of Information Technology and Engineering

Department: Statistics

This certificate, a joint program with CHHS, prepares participants to apply statistical methods to quantitative analysis of health care issues. It is aimed at health scientists and professionals in government agencies such as the National Institutes of Health, pharmaceutical companies, research hospitals, public health agencies, and other medical research organizations that design medical experiments and analyze and interpret increasingly complex health care data. The program will also help prepare students begin careers in such organizations. The certificate is taught jointly by faculty from the Department of Statistics and Department of Global and Community Health.

Admission Requirements

Applicants must hold a bachelor’s degree from a regionally accredited institution of higher education in a discipline related to health science or statistics, with a GPA of 3.00 in the last 60 credits. Such fields include medicine, biology, nursing, health science, biostatistics, statistics, mathematics, and psychology. A course in college algebra with a grade of B or higher is required for admission to the program.

Certificate Requirements

Students must complete one course from each of the five groups. All listed STAT courses except STAT 535 and STAT 660 require three semesters of calculus.

- STAT 535 - Analysis of Experimental Data Using SPSS Credits: 3
  or
- STAT 554 - Applied Statistics Credits: 3
- STAT 660 - Biostatistical Methods Credits: 3
- GCH 804 - Advanced Quantitative Data Analysis for Health Care Research I Credits: 3
  or
- NURS 804 - Advanced Quantitative Data Analysis for Health Care Research I Credits: 3
  or
- STAT 656 - Regression Analysis Credits: 3
  or
- STAT 668 - Survival Analysis Credits: 3
- GCH 805 - Advanced Quantitative Data Analysis for Health Care Research II Credits: 3
  or
- NURS 805 - Advanced Quantitative Data Analysis for Health Care Research II Credits: 3
  or
- STAT 662 - Multivariate Statistical Methods Credits: 3
- GCH 712 - Introduction to Epidemiology Credits: 3

Federal Statistics Graduate Certificate

Banner Code: VS-CERG-FSS
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; data analysis, including graphics and data visualization; databases and data security; parallel computation and related technology; geographic information systems; and issues of statistics and public policy. 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.

Admission Requirements

Potential candidates should hold a bachelor’s degree and have taken at least two courses in calculus and one course in calculus-based probability and statistics. These requirements are normally satisfied by students that 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 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: 9 credits of certificate courses plus 6 credits of electives.

Certificate Courses (9 credits)

The certificate courses build the foundations of statistical analysis and survey methods. They consist of the following:

- STAT 535 - Analysis of Experimental Data Using SPSS Credits: 3
  OR
- 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 Credits: 3
- STAT 665 - Categorical Data Analysis Credits: 3
- STAT 673 - Statistical Methods for Longitudinal Data Analysis Credits: 3
- STAT 674 - Survey Sampling II Credits: 3
- STAT 779 - Topics in Survey Design and Analysis Credits: 1-3

All of these 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.

Elective Courses (6 credits)
The elective courses are intended to provide a broad background supportive of the multidisciplinary needs of complex statistical systems. Elective courses may be chosen from any graduate STAT courses numbered below 876, except that only one of STAT 501-503 can be applied toward the certificate. Only 3 credits may be from other departments and must be approved in advance by the department’s graduate coordinator.

Suggested electives include:

- STAT 544 - Applied Probability Credits: 3
- STAT 660 - Biostatistical Methods Credits: 3
- STAT 664 - Bayesian Inference and Decision Theory Credits: 3
- STAT 668 - Survival Analysis Credits: 3
- STAT 751 - Computational Statistics Credits: 3
- STAT 758 - Advanced Time Series Analysis Credits: 3
- STAT 760 - Advanced Biostatistical Methods Credits: 3
- ECON 637 - Econometrics I Credits: 3
- OR 541 - Operations Research: Deterministic Models Credits: 3
- OR 542 - Operations Research: Stochastic Models Credits: 3
- PUAD 742 - Program Evaluation Credits: 3
- SOCI 631 - Survey Research Credits: 3

*Some courses may have prerequisites for which students must qualify or seek a waiver from the appropriate instructor.*

**Doctoral Degree**

**Statistical Science, PhD**

**Banner Code:** VS-PHD-STAT

**School:** The Volgenau School of Information Technology and Engineering

**Department:** Statistics

The terminal degree 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. Current research areas of key department faculty in the program include sampling, statistical signal processing, biometric identification, biostatistics, statistical genetics, statistical graphics, and data exploration.

**Degree Requirements**

Students are required to complete 72 credits. Typically, a student entering with a master’s degree in statistics, mathematics, or similar discipline is able to receive a reduction of up to 24 credits from approved course work. In particular, students entering with a master’s degree in statistics are expected to have completed course work equivalent to STAT 544, 554, 652, and 656 with a 3.50 GPA. 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.

**Written qualifying exams will be taken in the following areas:**
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

Additional Information:

The remaining five courses are selected and approved by the doctoral supervisory committee and the Statistics Department chair and should be numbered 600 or above. For STAT courses, qualified electives must be numbered 655 or above. STAT 700–701 do not count as electives for the PhD program.

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, 2 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.

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. If the student fails a second time, the student is terminated from the program.

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.

Systems Engineering and Operations Research

Phone: 703-993-1670
Web: seor.gmu.edu

School: The Volgenau School of Information Technology and Engineering

Faculty

Professors: Adelman, Chang, Chen, Donohue, Hoffman, Nash, Polyak, Schum, Sage, Sofer (chair)

Associate professors: Brouse, Laskey, Loerch, Shortle, Speller, White
Assistant professors: Ganesan, Liu

Affiliated faculty members: Houck, VanTrees

Research and term professors: Costa, Gross, Sherry, Wagenhals, Wagner, Wolman

Adjunct professors: Alexander, Barry, Camp, Carley, Durbin, Fischer, Humphrey, Killam, Laveson, McDevitt, Rothwell, Soller, Stephenson, Wieland, Yost

Emeritus faculty: 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, master’s degrees in systems engineering and in operations research, and a PhD degree in systems engineering and operations research. In addition, the department offers five certificate programs at the master’s level: architecture-based systems engineering; command, control, communications, computing, and intelligence (C4I); military operations research; computational modeling; 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 for an organization to use all of a given 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, automobiles, intelligent robots, stereos, 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.

Operations research is the professional field that deals with using scientific methods in engineering and 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 operations research faculty members are principally involved in the theoretical and empirical study of managerial and operational processes, and the use of mathematical and computer models to optimize these systems. Models are needed for a variety of decision-making purposes in business, industry, scientific research, and government to describe different environments and relate alternative plans of action. Thus, the courses in operations research focus on quantitative modeling and the analysis of complex systems. Courses stress the use of contemporary computer hardware and software in modeling and analysis. The Bureau of Labor Statistics predicts that the field of operations research will be one of the fastest-growing professions of the next decade.

Obviously, 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
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 and manufacturing systems, and corporate processes.

Specifically, the objectives of the systems engineering program are that graduates of the program will be able to:

- Apply fundamental concepts of mathematics, science, information technology, and engineering to contemporary and future systems.
- Contribute to the development of systems using systems engineering methods, processes, models, and tools.
- Work effectively as a member of multidisciplinary teams and behave in a professional, ethical, and responsible manner (including establishing a foundation for lifelong learning in systems engineering and related areas).
- Communicate effectively with team members and decision makers orally and in writing.

This program is accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology, 111 Market Place, Suite 1050, Baltimore, Maryland 21202-4012; 410-347-7700. The requirements for the degree may be satisfied on a part-time basis. Cooperative education provides students with the opportunity to integrate paid career-related work experience with classroom learning.

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:

- \text{MATH 113} - Analytic Geometry and Calculus I Credits: 4
- \text{MATH 114} - Analytic Geometry and Calculus II Credits: 4
- \text{MATH 203} - Linear Algebra Credits: 3
- \text{MATH 213} - Analytic Geometry and Calculus III Credits: 3
- \text{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:

• 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:

• CS 112 - Introduction to Computer Programming Credits: 4  
• CS 211 - Object-Oriented Programming Credits: 3

Humanities and social sciences:

• Approved courses in literature, Western civilization, global understanding, arts, and synthesis to satisfy the university’s general education requirement. Note that all general education courses should be selected from the department's list of approved courses.  
• COMM 100 - Public Speaking Credits: 3  
• ECON 103 - Contemporary Microeconomic Principles Credits: 3  
• ENGL 101 - Composition Credits: 3  
• ENGL 302 - Advanced Composition Credits: 3 for the natural sciences and technology

Engineering:

• ENGR 107 - Introduction to Engineering Credits: 2

Systems engineering:

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

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 advisor must approve changes to the plan of study. All students in systems engineering are required to see their advisor at least once each semester to plan for the next semester’s registration.

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 230 - Hydraulics Credits: 3
• ENGR 210 - Statics and Dynamics Credits: 3
• ENGR 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 332 - Object-Oriented Software Design and Implementation Credits: 3
• CS 421 - Software Requirements and Design Modeling Credits: 3

Synthesis Requirement

Mason’s synthesis requirement for systems engineering majors is satisfied by successful completion of SYST 495.

Writing-Intensive Requirement

Mason’s writing-intensive requirement for systems engineering majors is satisfied by successful completion of SYST 489.

General Education Electives

General education electives should be selected from the department’s list of approved courses.

Sample Schedule

The following sample schedule shows 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

• COMM 100 - Public Speaking Credits: 3
• ECON 103 - Contemporary Microeconomic Principles Credits: 3
• ENGL 101 - Composition Credits: 3
• ENGR 107 - Introduction to Engineering Credits: 2
• MATH 113 - Analytic Geometry and Calculus I Credits: 4
Total: 15 credits

Second Semester

- 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

Total: 15 credits

Third Semester

- 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 (3)

Total: 16 credits

Fourth Semester

- 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

Total: 14 credits

Fifth Semester
• ENGL 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

Total: 15 credits

Sixth Semester

• 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

Total: 15 credits

Seventh Semester

• 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

Total: 15 credits

Eighth Semester

• OR 442 - Stochastic Operations Research Credits: 3
• SYST 495 - Senior Design Project II Credits: 3
• Technical elective Credits: 3
• Global understanding course. Credits: 3
• Western civilization or world history course (HIST 100 or HIST 125). Credits: 3

Total: 15 credits
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. Available minors include data analysis and computer science. Students should see their advisor and the departments offering the minors for specific requirements.

Bachelor's Level Certificate

Operations Research and Engineering Undergraduate Certificate

Banner Code: BS-CERB-OR

School: The Volgenau School of Information Technology and Engineering

Department: Systems Engineering and Operations Research

This certificate program is open to students enrolled in the computer science, decision sciences, and mathematics undergraduate degree programs. The certificate augments the standard curricula with material on the computational aspects of operations research. Because the demand for people trained in this area is great, this program expands the career options available to students.

Certificate Requirements

- MATH 313 - Introduction to Applied Mathematics Credits: 3
- OR 335 - Discrete Systems Simulation Modeling Credits: 3
- OR 441 - Deterministic Operations Research Credits: 3
- OR 442 - Stochastic Operations Research Credits: 3
- STAT 344 - Probability and Statistics for Engineers and Scientists I Credits: 3
- STAT 362 - Introduction to Computer Statistical Packages Credits: 3

Plus two of the following courses:

- Any 400-level STAT class
- OR 481 - Numerical Methods in Engineering Credits: 3
- OR 498 - Independent Study in Operations Research Credits: 1-3
- OR 499 - Special Topics in Operations Research Credits: 3
- STAT 354 - Probability and Statistics for Engineers and Scientists II Credits: 3
Note:

Students seeking the certificate must apply to the SEOR Department.

Undergraduate Minor

Systems Engineering and Operations Research Minor

Banner Code: SEOR

School: The Volgenau School of Information Technology and 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:

Two required SEOR courses:

- SYST 101 - Understanding Systems Engineering Credits: 3
  or
- SYST 210 - Systems Design Credits: 3
  and
- OR 335 - Discrete Systems Simulation Modeling Credits: 3

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. For policies governing all minors, see the Academic Policies chapter of this catalog.

Bachelor's/Accelerated Master's Program

BS/Operations Research, Accelerated MS

School: The Volgenau School of Information Technology and Engineering

Department: Systems Engineering and Operations Research

Qualified undergraduate students may apply for 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.

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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/Systems Engineering, Accelerated MS

School: The Volgenau School of Information Technology and Engineering

Department: Systems Engineering and Operations Research

Qualified undergraduate students may apply for 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 on 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: The Volgenau School of Information Technology and 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 undergraduate credits 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 for 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 into 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

The following courses may be taken by a systems engineering undergraduate student 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: The Volgenau School of Information Technology and 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 four concentration areas or in an individual plan approved by the student's advisor.

Core Courses, Project

- OR 541 - Operations Research: Deterministic Models Credits: 3
- OR 542 - Operations Research: Stochastic Models Credits: 3
- OR 635 - Discrete System Simulation Credits: 3
- OR 680 - Project Course in Operations Research Credits: 3
- STAT 544 - Applied Probability Credits: 3

*Students who have performed well in their undergraduate calculus-based probability class may take OR 645 Stochastic Processes instead.

OR Electives

At least three 600-level or higher OR courses must be taken. These include 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 648 - Production and Inventory Systems Credits: 3
• OR 675 - Reliability Analysis Credits: 3
• OR 674 - Dynamic Programming Credits: 3
• OR 677 - Statistical Process Control Credits: 3

**Additional Electives**

Up to two additional elective courses may be chosen with written concurrence of the advisor. 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, and mathematics. At least one of these electives must be taken from SEOR’s course offerings.

With the advisor’s permission, a qualified student may elect to write a thesis in place of 3 credits of course work from the methodological or applications area.

**Concentrations**

Students may construct concentration areas by choosing electives from among special groupings. The four concentrations available are decision analysis, military operations research, optimization, and stochastic modeling.

▲ **Concentration in Decision Analysis (DA)**

Students concentrating in decision analysis must complete the following. The remaining two electives are chosen with written concurrence of the student’s advisor and must include one deterministic methods course and one stochastic methods course.

• 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

▲ **Concentration in Military Operations Research (MOR)**

Students concentrating in military operations research must complete the following. The remaining two courses are chosen with written concurrence of the student’s advisor and must include one deterministic methods course and one stochastic methods course.

• 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

▲ **Concentration in Optimization (OPT)**
Students whose primary interest is in optimization may complete a concentration by choosing three courses from the following. The remaining two courses are chosen with written concurrence of the advisor. They should be tailored to the student’s interest and must include at least one stochastic methods course. The other course may be chosen from the department’s offerings, appropriate offerings in other departments within the Volgenau School, and appropriate courses from other university departments. A sample of possible courses outside SEOR is available from the department office.

- 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

▲ Concentration in Stochastic Modeling (STM)

Students concentrating in stochastic modeling must complete one 600-level statistics course (numbered 634 or above) and two courses from the following. The remaining two courses are chosen with written concurrence of the student’s advisor and must include at least one deterministic methods course.

- OR 645 - Stochastic Processes Credits: 3
- OR 647 - Queuing Theory Credits: 3
- OR 648 - Production and Inventory Systems Credits: 3
- OR 674 - Dynamic Programming Credits: 3
- OR 677 - Statistical Process Control Credits: 3

Dual-Degree MS in Operations Research and Statistical Science

The program allows students to earn an MS in Operations Research and and MS in statistical science by completing 48 credits of course work in both areas instead of the 60 that would be required of the degrees were sought independently. See the corresponding catalog entry.

Systems Engineering, MS

Banner Code: VS-MS-SYST

School: The Volgenau School of Information Technology and 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 pursuing 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. Either a thesis (6 credits) or research project (3 credits) is required for the degree. 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

Project or Thesis

Each student must complete a project (3 credits); under certain circumstances students may complete a thesis (6 credits). Under the project option, students complete 3 credits of SYST 798, in which students propose and conduct an approved team project. A project report is submitted at the end of the semester, and a final presentation is made to the Systems Engineering and Operations Research Department faculty. Under the thesis option, students complete 6 credits 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 from the Systems Engineering and Operations Research Department, and the final written thesis and oral defense are approved by a three member faculty committee and submitted to the Volgenau School. The thesis work is expected to be completed while taking 6 credits of SYST 799. Although students may register for more than 6 credits, only 6 credits can be applied toward the degree.

Core Courses
Students must complete the following three core courses (9 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

Methods Courses

Students must complete two basic methods courses, including SYST 611 System Methodology and Modeling. The other basic methods course may depend on the emphasis chosen by the student and must be selected from the following list:

- 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

Emphasis Courses

Students must complete a set of elective courses that, together with the basic methods courses, constitute a clearly defined emphasis within systems engineering. Students pursuing the thesis option complete three electives in an emphasis; students pursuing the project option complete four electives in an emphasis.

Students may create their own emphasis with the approval of their advisor, or they may choose one of the following six emphases: systems engineering analysis, systems management, architecture-based systems integration, C4I, systems engineering of software-intensive systems, and advanced transportation systems. Approved basic methods courses and electives for the major emphases are as follows.

**Systems Engineering Analysis Emphasis**

Systems engineers must address a broad range of issues relevant to the design, implementation, analysis, and management of systems. This emphasis 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.

**Basic methods courses:**

- SYST 611 - System Methodology and Modeling Credits: 3
- One additional course from the list of basic methods courses

**Emphasis-specific courses:**

Students must complete the following course:
- SYST 542 - Decision Support Systems Engineering Credits: 3

The remaining courses are electives taken from the list below. The set of elective courses must constitute a well-defined focus and must be approved by the student’s advisor. Courses designated as basic methods courses may also be used as elective courses once the requirement of two basic methods courses has been met:
- SYST 619 - Introduction to Architecture Based Systems Engineering. Credits: 3
- SYST 621 - Systems Architecture Design Credits: 3
- SYST 671 - Judgment and Choice Process 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

Systems Management Emphasis

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 track emphasizes the theory and practice of systems management and prepares students for careers in managing the development of complex systems.

Basic methods courses:

- SYST 611 - System Methodology and Modeling Credits: 3
- One additional course from the list of basic methods courses.

Emphasis-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 courses are electives taken from the list below. The set of elective courses must constitute a well-defined focus and must be approved by the advisor. Courses designated as basic methods courses may also be used as elective courses once the requirement of two basic methods courses has been met:
- 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 - Judgment and Choice Processing and Decision Making Credits: 3
  or
- OR 671 - Judgment and Choice Processing and Decision Making Credits: 3
- SYST 677 - Statistical Process Control Credits: 3
Architecture-Based Systems Integration Emphasis

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 emphasis 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.

Basic methods courses:

- SYST 611 - System Methodology and Modeling Credits: 3
- SYST 620 - Discrete Event Systems Credits: 3

Emphasis-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 622 - System Integration and Architecture Evaluation. Credits: 3

The remaining course is an elective taken from the list below. 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 542 - Decision Support Systems Engineering Credits: 3
- SYST 571 - Systems Engineering Management Credits: 3
- SYST 683 - Modeling, Simulation, and Gaming Credits: 3

Command, Control, Communications, Computing, and Intelligence Emphasis

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.
Basic methods courses:

- OR 542 - Operations Research: Stochastic Models Credits: 3
  or
- ECE 528 - Introduction to Random Processes in Electrical and Computer Engineering Credits: 3
- SYST 611 - System Methodology and Modeling Credits: 3

Emphasis-specific courses:

Students must take the following:

- SYST 680 - Principles of Command, Control, Communications, Computing, and Intelligence (C4I) Credits: 3
  or
- ECE 670 - Principles of C4I Credits: 3
- SYST 683 - Modeling, Simulation, and Gaming Credits: 3

The remaining courses are electives taken from the list below. The set of elective courses must constitute a well-defined focus. Courses designated as basic methods courses may also be used as electives once the requirement of two basic methods courses has been met:

- SYST 671 - Judgment and Choice Processing and Decision Making Credits: 3
- SYST 684 - Sensor Data Fusion Credits: 3
- SYST 685 - Estimation and Tracking: Principles and Techniques 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

Systems Engineering of Software-Intensive Systems Emphasis

This emphasis 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.

Basic methods courses:

- SYST 611 - System Methodology and Modeling Credits: 3
- One additional course from the list of basic methods courses.

Emphasis-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 courses are electives taken from the list below. The set of elective courses must constitute a well-defined focus and approved by the student's advisor. Courses designated as basic methods courses may also be used as elective courses once the requirement of two basic methods courses has been met:

- 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

At most one of the following:

- CS 555 - Computer Communications and Networking Credits: 3
  or
- ECE 542 - Computer Network Architectures and Protocols Credits: 3
  or
- INFS 612 - Principles and Practices of Communication Networks Credits: 3

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### Advanced Transportation Systems Emphasis

The air transportation system is among the most complex networked systems. This specialization 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 courses:

- SYST 611 - System Methodology and Modeling Credits: 3
- One additional course from the list of basic methods courses.

#### Emphasis-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 courses are electives taken from the list below. The set of electives must constitute a well-defined focus and must be approved by the student's advisor. Courses designated as basic methods courses may also be used as electives once the requirement of two basic methods courses has been met:

- 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

Dual Master's

Operations Research and Statistical Science Dual- Degree MS (OPRS)

Banner Codes: VS-MS-OPRS, VS-MS-STAT

School: The Volgenau School of Information Technology and 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:

- OR 541 - Operations Research: Deterministic Models Credits: 3
- OR 542 - Operations Research: Stochastic Models Credits: 3
- OR 635 - Discrete System Simulation Credits: 3
- OR 680 - Project Course in Operations Research 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
Elective Credits in STAT Courses

12 elective credits in STAT courses numbered 574 or higher, excluding STAT 700 and 701. 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.

Master's Level Certificate

Architecture-Based Systems Integration Graduate Certificate

Banner Code: VS-CERG-ABSI

School: The Volgenau School of Information Technology and Engineering

Department: Systems Engineering and Operations Research

This 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.

Certificate Requirements

The following courses must be completed with a GPA of B or better:

- SYST 520 - System Engineering Design Credits: 3
- SYST 619 - Introduction to Architecture Based Systems Engineering. Credits: 3
Completing the ABSI Certificate within the MS/SE Program

In addition to the ABSI Certificate courses students must take 5 courses (15 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 798 - Systems Engineering Project Credits: 3
- One approved elective from the ABSI Emphasis. Credits: 3

Command, Control, Communications, Computing, and Intelligence Graduate Certificate

Banner Code: VS-CERG-C4I

School: The Volgenau School of Information Technology and 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.

Certificate Requirements

The certificate consists of 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
  and
- OR 542 - Operations Research: Stochastic Models Credits: 3
  or
- ECE 528 - Introduction to Random Processes in Electrical and Computer Engineering Credits: 3
and three courses out of the following:

- 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 685 - Estimation and Tracking: Principles and Techniques 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

Completing the C4I Certificate within the MS/SE Program

In addition to the 5 certificate courses, 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 798 - Systems Engineering Project Credits: 3

Computational Modeling Graduate Certificate

Banner Code: VS-CERG-CCM

School: The Volgenau School of Information Technology and 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.

Certificate Requirements

- OR 682 - Computational Methods in Engineering and Statistics Credits: 3
  or
- CSI 700 - Numerical Methods Credits: 3
- OR 541 - Operations Research: Deterministic Models Credits: 3
• OR 635 - Discrete System Simulation Credits: 3
• STAT 634 - Case Studies in Data Analysis Credits: 3

In addition, candidates must choose any two of the following electives:

• CSI 744 - Linear and Nonlinear Modeling in the Natural Sciences Credits: 3
• CSI 773 - Statistical Graphics and Data Exploration Credits: 3
• OR 542 - Operations Research: Stochastic Models Credits: 3
• OR 680 - Project Course in Operations Research Credits: 3
• SYST 683 - Modeling, Simulation, and Gaming Credits: 3

Note:

Students who have already taken the equivalent of any of the required courses may, with permission of the department chair, complete the certificate program by taking only 15 credits of course work.

Discovery, Design, and Innovation Graduate Certificate

Banner Code: VS-CERG-DDI

School: The Volgenau School of Information Technology and 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.

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
• IT 894 - Design and Inventive Engineering Credits: 3
• IT 944 - The Process of Discovery and Its Enhancement in Engineering Applications Credits: 3

and two of the following:

• CEIE 601 - Infrastructure Modeling Credits: 3
  or
• CEIE 670 - Civil Engineering Decision Methods and Tools Credits: 3
• SYST 573 - Decision and Risk Analysis Credits: 3 (recommended if going on for MS in civil and infrastructure engineering)

• SYST 664 - Bayesian Inference and Decision Theory Credits: 3
  or
• STAT 664 - Bayesian Inference and Decision Theory Credits: 3

• SYST 781 - Data Mining and Knowledge Discovery Credits: 3
  or
• STAT 781 - Data Mining and Knowledge Discovery Credits: 3

• STAT 652 - Statistical Inference Credits: 3
• STAT 700 - Advanced Quantitative Data Analysis for Health Care Research II Credits: 3
• STAT 701 - Advanced Multivariate Statistics and Data Analysis in Health Care Research Credits: 3

• OR 671 - Judgment and Choice Processing and Decision Making Credits: 3
  or
• SYST 671 - Judgment and Choice Processing and Decision Making Credits: 3

• IT 819 - Computational Models for Probabilistic Inference Credits: 3

Military Operations Research Graduate Certificate

Banner Code: VS-CERG-MOR

School: The Volgenau School of Information Technology and 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.

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
Systems Engineering of Software-Intensive Systems Graduate Certificate

Banner Code: VS-CERG-SIS

School: The Volgenau School of Information Technology and 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, 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.

Certificate Requirements

To be eligible for a certificate, students must complete with an average grade of B or better the following:

- 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
- And two out of the following:
  - SYST 542 - Decision Support Systems Engineering Credits: 3
  - SYST 619 - Introduction to Architecture Based Systems Engineering Credits: 3
  - SWE 619 - Object-Oriented Software Specification and Construction Credits: 3
  - ECE 542 - Computer Network Architectures and Protocols Credits: 3
  - CS 555 - Computer Communications and Networking Credits: 3
  - INFS 612 - Principles and Practices of Communication Networks Credits: 3

Only one of ECE 542, CS 555 and INFS 612 may be taken.

Completing the Certificate within the MS in Systems Engineering:

Students studying for the MS in systems engineering in conjunction with the certificate will need to complete the following courses in addition to the certificate courses:

- SYST 530 - System Management and Evaluation Credits: 3
- SYST 611 - System Methodology and Modeling Credits: 3
- SYST 798 - Systems Engineering Project Credits: 3
- One additional methods course
- One additional elective approved for the Software Intensive Systems emphasis

Doctoral Degree
Systems Engineering and Operations Research, PhD

Banner Code: VS-PHD-SEOR

School: The Volgenau School of Information Technology and 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.

Admissions

All general Mason and specific Volgenau School admissions requirements apply. Candidates for the PhD program 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 nonnative English speakers. All of an applicant’s background is examined before an admission decision is made.

Program Requirements

Course Requirement

Students entering with a master's degree in a related discipline will be require to complete at least 48 credits. In particular, students entering with a master's degree will be required to complete at least 24 credits of advanced emphasis course work and at least 24 research credits from SEOR 998 Doctoral Dissertastion Proposal and SEOR 999 Doctoral Dissertation, with at least 12 credits of SEOR 999. Students entering without an MS will need at least 24 additional credits of coursework.
Coursework Requirement (Students with MS)

Students are required to complete at least 24 credits of advanced coursework including:

- 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 798 Project in Systems Engineering and OR 680 Project in Operations Research

No more than 3 credits are allowed for a directed reading course. All courses must be approved by the student's dissertation committee chair. Course substitutions must be approved by the dissertation committee chair and SEOR department chair. 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.

Coursework Requirement (Students without MS)

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

and

- 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 798 or OR 680. Consult the SEOR Department for further detail. Credits taken in the courses SYST 798 or OR 680 may not be applied towards the PhD degree program requirements.

Plan of Study

All decisions concerning the student’s course requirements and plan of study must be approved by the advisor or director, with consent of the department’s doctoral coordinator.

Qualifying Exam

Each student must take four exams within two years of enrolling in the program. The exam is primarily for testing the students’ familiarity with fundamental concepts.

- 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
Note:

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.

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 four members from the SEOR department-approved graduate faculty, and at least one non-SEOR member from the Mason faculty. The composition of the doctoral supervisory committee is to be approved by the doctoral coordinator. At least three 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 course work requirements in the approved plan of study filed by the student. The examiners will include SEOR faculty and 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. 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, to have 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.

Concentration

▲ Concentration in Operations Research (OPRS)

Admissions

Students are usually admitted with an MS degree in systems engineering, operations research, or some related engineering or information technology area. The admissions materials are similar to those of the PhD in information technology; however, submittal of GRE scores is mandatory.

Requirements

Students seeking one of these concentrations must satisfy all requirements for the PhD in information technology. In addition, the following requirements must be met:

Plan of Study

All decisions concerning the student’s course requirements and plan of study must be approved by the advisor or director, with consent of the department’s doctoral coordinator.

Doctoral Supervisory Committee

The committee chair should be selected from the list of approved chairs of SEOR, and the dissertation director must be a member of SEOR. The doctoral supervisory committee must include at least three members from SEOR. The composition of the doctoral supervisory committee is to be approved by the doctoral coordinator. Permission for the comprehensive exam and dissertation defense are requested from the Volgenau School associate dean on the basis of a written request and plan that has been approved by the supervisory committee and the department’s doctoral coordinator.

Qualifying Exams

Each student must take a set of four exams from three different degree programs from the following:

- OR 541 - Operations Research: Deterministic Models
- OR 542 - Operations Research: Stochastic Models
- STAT 544 - Applied Probability
- STAT 554 - Applied Statistics
- SYST 520 - System Engineering Design
- SYST 573 - Decision and Risk Analysis

Advanced Emphasis Requirement
For students specializing in operations research, at least 18 of the 24 credits in the advanced emphasis requirement must be in OR courses numbered 600 or higher or in IT courses with an OR designation. For students specializing in systems engineering, at least 18 of the 24 credits must be in SYST courses numbered 600 or higher, or in IT courses with a SYST designation. All exceptions to this rule must be approved by the student’s doctoral supervisor committee and the department’s doctoral coordinator. The doctoral supervisory committee and the associate dean for graduate studies and research of the Volgenau School must approve the overall plan of study. A list of IT courses with an OR or SYST designation is available from the SEOR office.

▲ Concentration in Systems Engineering (SYST)

Admissions

Students are usually admitted with an MS degree in systems engineering, operations research, or some related engineering or information technology area. The admissions materials are similar to those of the PhD in information technology; however, submittal of GRE scores is mandatory.

Requirements

Students seeking one of these concentrations must satisfy all requirements for the PhD in information technology. In addition, the following requirements must be met:

Plan of Study

All decisions concerning the student’s course requirements and plan of study must be approved by the advisor or director, with consent of the department’s doctoral coordinator.

Doctoral Supervisory Committee

The committee chair should be selected from the list of approved chairs of SEOR, and the dissertation director must be a member of SEOR. The doctoral supervisory committee must include at least three members from SEOR. The composition of the doctoral supervisory committee is to be approved by the doctoral coordinator. Permission for the comprehensive exam and dissertation defense are requested from the Volgenau School associate dean on the basis of a written request and plan that has been approved by the supervisory committee and the department’s doctoral coordinator.

Qualifying Exams

Each student must take a set of four exams from three different degree programs from the following:

- OR 541 - Operations Research: Deterministic Models
- OR 542 - Operations Research: Stochastic Models
- STAT 544 - Applied Probability
- STAT 554 - Applied Statistics
- SYST 520 - System Engineering Design
- SYST 573 - Decision and Risk Analysis
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Director of Leadership Education and Development: Juliet Blank-Godlove, MA
Interim Director, Alcohol, Drug, and Health Education: Mary Ann Sprouse, MSW, LCSW
Director, University Career Services: Janice Sutera, PhD
Director, Early Identification Program: Tensie Cadenas, MA
Director, Counseling and Psychological Services: Jeff Pollard, PhD, ABPP
Director, Diversity Programs and Services: Joya Crear, MA
Director, Sexual Assault Services: Connie Kirkland, MA
Director, Women and Gender Studies Center: Nancy Hanrahan, PhD
Director, International Programs and Services: Judith Green, MA
Director, English Language Institute: John Pope, MA
Faculty Coordinator, Student Media Group: Kathryn Mangus, MA

Faculty

Faculty Emeriti

Victorio G. Aguera, BST, MA, PhD, Professor Emeritus of Spanish
Rita Ailinger, BS, MS, MA, PhD, Professor Emerita of Nursing
Vassily P. Aksyonov, MD, Professor Emeritus of Russian Literature and Writing
John Allen, AB, MS, PhD, Associate Professor Emeritus of Psychology
Robert A. Anthony, BA, BA, JD, George Mason University Foundation Professor Emeritus of Law
Marjory Brown Azarowicz, BA, MA, PhD, Professor Emerita of Education
Anna Baraniecki, BS, MS, PhD, Associate Professor Emerita of Electrical and Computer Engineering
Ralph Barocas, BA, MS, PhD, Professor Emeritus of Psychology
Mary Catherine Batson, BA, PhD, Professor Emerita of Anthropology and English
Richard Baum, PhD, Associate Professor Emeritus of Computer Science
Guy O. Beale, BS, MS, PhD, Associate Professor Emeritus of Electrical and Computer Engineering
Barry K. Beyer, BA, MA, PhD, Professor Emeritus of Education
Peter Black, BA, MS, PhD, Professor Emeritus of Anthropology
W. Murray Black, BEE, MSEE, PhD, Professor Emeritus of Electrical and Computer Engineering
John Blaha, BS, MA, PhD, Associate Professor Emeritus of Psychology
A. Richard Bolstein, BA, MS, PhD, Associate Professor Emeritus of Statistics
C. Alan Boneau, BA, MA, PhD, Professor Emeritus of Psychology
John Bonfadini, BS, MEd, EdD, Associate Professor Emeritus of Education
Thomasina Borkman, BA, MA, PhD, Professor Emerita of Sociology
Beverly Boyd, MS, MNE, Assistant Professor Emerita of Nursing
Ted Bradley, BS, MA, PhD, Professor Emeritus of Environmental Science and Policy
Rosemarie Brenkus, BS, MAEd, Assistant Dean Emerita of Nursing
Brack Brown, AB, MA, PhD, Professor Emeritus of Public and International Affairs

George Mason University 2009-2010 Official University Catalog
Stephen J. Brown, BA, MA, PhD, Professor Emeritus of English
James Buchanan, BS, MA, PhD, Distinguished Professor Emeritus of Economics
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Mary Kay Cabell, BA, MA, PhD, Associate Professor Emerita of Mathematical Sciences
Le Cao, BS, MBA, DBA, Associate Professor Emerita of Accounting
Rita Carty, BSN, MSN, DNSc, Dean Emerita, College of Nursing and Health Science
Ernest Cassara, AB, BD, PhD, Professor Emeritus of History
Peter Ceperly, BA, MS, PhD, Professor Emeritus of Physics
Arthur H. Chickerling, AB, AMT, PhD, Professor Emeritus of Education
Jae W. Chung, BC, MC, MA, PhD, Professor Emeritus of Economics
Robert Purdue Clark, BA, MA, PhD, Professor Emeritus of Public and International Affairs
Martin B. Cohen, BA, MA, PhD, Assistant Professor Emeritus of History
Virginia Collier, BA, MA, PhD, Professor Emerita of Education
John Henry Cooper, BA, MA, DPE, Chair Emeritus of Health, Sport, and Leisure Studies
Anne Cordero, MA, PhD, Associate Professor Emerita of French
Edward Clark Dobson, BME, MS, PhD, Associate Professor Emeritus of Education
Jean-Paul Dumont, Licence es Lettres, PhD, Clarence J. Robinson Professor Emeritus
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Jenefir Isbister, Professor Emerita of Molecular and Microbiology
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Raymond G. LePage, BA, MA, PhD, Associate Professor Emeritus of French
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Conrad Philos, Professor Emeritus of Law
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Robert Rugel, BA, PhD, Associate Professor Emeritus of Psychology
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Jay Shaffer, BS, PhD, Professor Emeritus of Biology
Mary Silva, BS, MS, PhD, Professor Emerita of Nursing
Judith Skog, BS, MS, PhD, Professor Emerita of Environmental Science and Policy
James G. Smith, BM, MM, DMA, Professor Emeritus of Music
Kitty Parker Smith, BSN, MSN, Associate Professor Emerita of Nursing and Health Services
Vernon L. Smith, BSEE, MA, PhD, University Professor Emeritus
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John P. Soder, BA, MA, PhD, Associate Professor Emeritus of History
Mark Spikell, BA, MEd, EdD, Professor Emeritus of Education
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Karen Vaughn, BA, MA, PhD, Professor Emerita of Economics
Irmgard Wagner, MA, PhD, Professor Emerita of German
Dorothy J. Walker, BSNE, MSNE, PhD, JD, Professor Emerita of Nursing
Gerald Wallace, BS, MEd, EdD, Professor Emeritus of Education
C. Robert Walter Jr., BA, PhD, Professor Emeritus of Chemistry
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George A. Zaphiriou, Professor Emeritus of Law

Instructional and Administrative Faculty 2009 - 10

The faculty list reflects appointments as of February 2009.

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

A

Abdalla, Wagida, Physician and Executive Director, Student Health Services. MD 1972, Alexandria University, Egypt; Diplomate of the American Board of Pediatrics, 1982.

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Agouris, Peggy, Chair and Professor of Geography and Geoinformation Systems. Dipl Eng 1986, National Technical University of Athens, Greece; MS 1988, PhD 1992, Ohio State University.


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Allnutt, Jeremy E., Professor, Electrical and Computer Engineering. BSc 1966, PhD 1970, Salford University.

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Anderson, Dawn, Associate Registrar for Operations. BBA 1994, Marymount University.


Anderson, LeKesha N., Advising Coordinator, Department of Communication. BS, University of Virginia’s College, Wise; MA 2004, East Tennessee State University.


Andronikov, Sergei, Director of Executive Programs in GIS Spatial Business Intelligence, School of Management. MSc 1980, Moscow State University; PhD 1988, Russian Academy of Sciences.


Antrim, James, Facilities Manager, College of Visual and Performing Arts. BFA 1976, University of Wisconsin; MA 1978, University of Minnesota.

Apitz, Anja, Term Assistant Professor of German. Magister in DaF 2002, Leipzig; PhD 2008, University of Iowa.

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Arthurs, Joshua W., Postdoctoral Teaching Fellow, History and Art History. BA 1997, Wesleyan University; MA 1999, PhD 2007 University of Chicago.

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.
Ashcraft, Thomas D., 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.

Atkinson, Jennifer H., Associate Professor, English. BA 1978, Wesleyan University; MFA 1984, MA 1985, University of Iowa.

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Austin, Clayton, Chair, Department of Theater; Associate Professor of Theater. BA 1973, Brandeis University; MFA 1986, Yale School of Drama.

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Axtell, Robert, Associate Professor, Department of Computational Social Science, Krasnow Institute for Advanced Study. BS 1983, University of Detroit; PhD 1992, Carnegie Mellon University.


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Bailey, Charles, Distinguished Professor of Biology. BS 1965, MS 1966, PhD 1968, Oklahoma State University.


Baker, Ann C., Associate Professor. 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 H., Assistant Professor of Special Education. BS 1984, MEd 1987, College of William and Mary; EdD 2002, Bowling Green State University.

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Barna, Adrienne M., Associate Director, Counseling and Psychological Services. AB 1970, Drew University; MEd 1972, Rutgers University; MA 1976, PhD 1980, University of Maryland.

Barnes, Steven, Assistant Professor, History and Art History. BA 1993, Harvard University; MA 1997, PhD 2003, Stanford University.

Barnhart, Melinda N., Executive Director, Finance and Administration, The Volgenau School of Information Technology and Engineering. BA 1973, Miami University; MEd 1992, George Mason University.

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Baruzzi, Andrea, Biology, Psychology, Environmental Sciences & Policy Liaison Librarian. BA, University of North Carolina, Greensboro; MLIS, Drexel University.

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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.

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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, Assistant Director, Institutional Assessment. BA 1996, Beijing Foreign Studies University; MEd, PhD 2003, Pennsylvania State University.

Zietsman, Lizette, Assistant Professor of Mathematical Sciences. BSc 1990, MSc 1992, PhD 2000, University of Pretoria.

Zimmerman, Emily, Lab Coordinator, Center for Social Science Research, Sociology and Anthropology. BA 1989, MS 1993, PhD 2001, City University of New York.

Zingraff, Matthew T., Associate Dean for Research, College of Humanities and Social Sciences; Professor of Administration of Justice. BS 1971, Virginia Commonwealth University; MS 1973, PhD 1976, Bowling Green State University.


Zolnik, Edmund J., Assistant Professor, Geography. BS 1985, Fairfield University, MA 2000, PhD 2004, University of Connecticut.

Zoltek, Stanley M., Associate Professor of Mathematics, Department of Computational and Data Sciences. BS 1970, St. John’s University; MA 1973, PhD 1976, State University of New York.
Krasnow Institute for Advanced Study

Phone: 703-993-4333
Web: krasnow.gmu.edu

Administration

James L. Olds, Director
Kenneth De Jong, Associate Director
James L. Olds, Chair, Department of Molecular Neuroscience
Claudio Cioffi-Revilla, Chair, Department of Computational Social Science

Faculty

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 2007, the institute became an academic unit housing the Department of Molecular Neuroscience and the Department of Computational Social Science (pending SCHEV approval). With an annual budget of $3.1 million, the institute is home to a scientific staff of 60. 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 $22 million in sponsored research from federal agencies such as the National Institutes of Health and private sources such as the Sir John Templeton Foundation.

GRADUATE PROGRAMS

■ Neuroscience, PhD       SC-PHD-NEUR

Phone: 703-993-4381
Web: neuroscience.gmu.edu

The Krasnow Institute, together with the College of Science (COS) and the College of Humanities and Social Sciences (CHSS), oversees the campuswide Neuroscience Council in developing the Neuroscience PhD curriculum.

Neuroscience PhD courses are listed under NEUR in the Course Descriptions section of this catalog. Neuroscience PhD admissions and program requirements are listed under Neuroscience in the College of Science section of this catalog.

■ Computational Social Science, PhD       SC-PHD-CSS

Phone: 703-993-1402
Web: socialcomplexity.gmu.edu
E-mail: cssgrad@gmu.edu
The core objective of the PhD in Computational Social Science (CSS) 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.

Admission Requirements

Applicants should have a bachelor’s degree in one of the social sciences; computer science, engineering, or a relevant discipline, and have taken 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 an object-based language. 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 COS Fairfax Campus Graduate Admissions Processing Center 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. TOEFL scores are required of all international applicants.

Degree Requirements

Students must maintain a minimum GPA of 3.00 in the program. 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
  - CSS 605 Object-Oriented Modeling for Social Science
  - CSS 610 Computational Analysis of Social Complexity
  - CSS 620 Origins of Social Complexity

- 6 credits of extended core CSS courses taken from the following:
  - CSS 625 Complexity Theory in the Social Sciences
  - CSS 645 Spatial Agent-Based Models
  - CSS 692 Social Network Analysis

- 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 or independent research, as approved by the student’s advisor, to provide further substantive or methodological specialization as needed. (Students possessing a strong background in computing, such as an 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, such as a BS in economics, will be required to use most or all of these electives in computing courses.)

- 24 credits of dissertation research to demonstrate doctoral-level originality and research excellence

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, cyberwarfare
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 area of concentration; ability to integrate materials from different courses; and potential for a successful dissertation.

The exam will consist of written and oral parts. On 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.

### Graduate Certificate in Computational Social Science  
**SC-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.

Students in the CSS certificate program must take both CSS 600 Introduction to Computational Social Science and CSS 610 Computational Analysis of Social Complexity. Students are also required to take a minimum of 9 credits in elective courses (for example, CSS 605, 620, 692). Students may include a maximum of 3 credits of programming courses to meet the requirements. Such programming courses as procedural, object-oriented languages, or other approved programming approaches (such as CSI 603 or 604 Introduction to Scientific Programming I or II may be used with approval of the director. Some courses on computational techniques, modeling, or statistics, such as visualization, graphics, and statistical and database packages (such as CSI 606 and 607), may also be used to meet the requirements with prior approval of the director. 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.

### 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 send to the COS Fairfax Campus Graduate Admissions Processing Center a completed Mason graduate application, two copies of official transcripts from each college and graduate institution attended, and a current résumé. TOEFL scores are required of all international applicants.
Applied Music Faculty

Bassoon

Douglas Kehlenbrink, Adjunct Associate Professor. BS, Ball State University; MM, James Madison University. Former faculty member, James Madison University.

Cello

Robert Park, Adjunct Assistant Professor. BS, University of Maryland, College Park; MM, DMA, Catholic University of America; principal cellist, U.S. Army Band of Washington, D.C. (Army Orchestra and Strolling Strings).

Loran Stephenson, Adjunct Associate Professor. BM, Curtis Institute of Music; MM, Catholic University of America; National Symphony Orchestra; former member, U.S. Army Band of Washington, D.C.

David Teie, Adjunct Associate Professor, Cello. BM, Peabody Conservatory of Music of the Johns Hopkins University; cellist, National Symphony Orchestra, Washington, D.C.

Clarinet

Sharon Bonneau, Adjunct Assistant Professor. BM, BME, Eastman School of Music; MA, George Mason University; former clarinetist, U.S. Air Force Band of Washington, D.C.

Lora Ferguson, Adjunct Associate Professor. BM, Oberlin Conservatory; MM, Catholic University of America; clarinetist, Kennedy Center Opera House Orchestra; Capitol Woodwind Quintet.

Brian Jones, Adjunct Assistant Professor. BME, Florida State University; MM, Baylor University; DMA, Catholic University of America; former member, U.S. Air Force Band of Washington, D.C.; instructor of clarinet, Levine School of Music.

Composition

Steve Antosca, Adjunct Assistant Professor. BA, Tulane University; MM, Peabody Conservatory of Music of Johns Hopkins University; Artist-in-Residence, Duke Ellington School of the Arts; cochair, Composition Department at Levine School of Music.

Glenn Smith, Professor. BA, MA, California State University, Hayward; DMus, Indiana University.

Mark Camphouse, Professor. BM, MM, Northwestern University; former director of bands, Radford University.

Conducting

Stanley Engebretson, Professor. BA, MA, University of North Dakota; DMA, Stanford University; artistic director, Masterworks Chorus and Orchestra; music director, New York Avenue Presbyterian Church; former associate conductor, Minnesota Chorale.

Anthony Maiello, Professor. BS, MS, Ithaca College; Director of Instrumental Music Studies, George Mason University; former chairman of performance, Potsdam College of State University of New York; former associate conductor, McLean (Virginia) Orchestra.

Mark Camphouse (see Composition)
Euphonium

Roger Behrend, Adjunct Professor. BME, Michigan State University; MA, George Mason University; solo/principal euphoniumist, U.S. Navy Band of Washington, D.C.

Flute

Judith Lapple, Adjunct Professor. BM, Eastman School of Music; MM, Northeast Louisiana University; former principal flutist, U.S. Air Force Band of Washington, D.C.

Thomas Perazzoli, Adjunct Associate Professor. Philadelphia Musical Academy; flutist, National Symphony Orchestra.

Guitar (Classical)

Larry Snitzler, Adjunct Professor. Former student of Andres Segovia (guitar) and Nadia Boulanger (theory).

Guitar (Jazz)

Richard Whitehead, Adjunct Assistant Professor. Former member U.S. Air Force Airmen of Note.

Harp

Jeanne Chalifoux, Adjunct Assistant Professor. Artist Diploma, Curtis Institute of Music; former harpist, National Gallery Orchestra and National Symphony Orchestra.

Horn

Eric Moore, Adjunct Assistant Professor. BME, BA, Boston University; MM, University of Texas at Austin; principal horn, U.S. Navy Band and Fairfax Symphony.

Edwin Thayer, Adjunct Associate Professor. BM, MM, University of Illinois; hornist, National Symphony Orchestra.

David Whaley, Adjunct Associate Professor. BME, Drake University; MM, DMA, University of Illinois; hornist, National Symphony Orchestra.

Koto

Kyoko Okamoto, Adjunct Assistant Professor. Bachelor in Languages, Kyoto University of Foreign Studies; Toho Kinshu Kai (Koto School).

Oboe

Lorrie Berkshire-Brown, Adjunct Assistant Professor. BM, Arizona State University; MM, Manhattan School of Music; oboist, U.S. Army Band of Washington, D.C.; substitute oboist, New York Philharmonic Orchestra.

Organ

William Neil, Adjunct Professor. BA, Pennsylvania State University; MM, Syracuse University; University of Michigan; Juilliard School; organist and keyboardist, National Symphony Orchestra, Chamber Soloists of Washington.
**Percussion**

*Kenneth Harbison*, Adjunct Associate Professor. BM, Eastman School; MM, Catholic University of America; assistant principal percussionist, National Symphony Orchestra.

*John Kilkenny*, Adjunct Assistant Professor. BM, The Juilliard School; MM, Temple University; music director, Metropolitan Wind Symphony; cochair, University of Maryland Summer Percussion Workshop.

**Percussion (Jazz)**

*Harold Summey*, Adjunct Assistant Professor. MM, Howard University; member, U.S. Army Band.

**Piano**

*Anna Balakerskaia*, Adjunct Artist Professor. MM, DMA, St. Petersburg State Conservatory, Russia; former faculty member, Moscow and St. Petersburg State Conservatories.

*Joanne Haroutounian*, Adjunct Associate Professor. BA, Trenton State College; MA, American University; PhD, University of Virginia; pedagogy author, lecturer, and clinician.

*Linda Apple Monson*, Associate Professor. BMEd, MM, DMA, Peabody Conservatory of Music of Johns Hopkins University; diploma (piano performance), Santiago de Compostela, Spain; former faculty member of Peabody Institute, College of Notre Dame of Maryland, and Northern Virginia Community College.

**Piano (Jazz)**

*Wade Beach*, Adjunct Assistant Professor. BM, MM, University of Maryland; former member, U.S. Air Force Band Airmen of Note.

**Saxophone**

*Richard Parrell*, Adjunct Assistant Professor. BA, BM, George Mason University; MME, North Texas State University; solo principal saxophonist, U.S. Army Band of Washington, D.C.

*Timothy Roberts*, Adjunct Associate Professor, Saxophone. BM Northwestern University; MM, DMA Catholic University of America; principal saxophonist and a National Tour soloist with the United States Navy Band in Washington, D.C.; coordinator of the Navy Band’s International Saxophone Symposium.

*Dale Underwood*, Adjunct Professor. Texas Tech University; former saxophone soloist, U.S. Navy Band of Washington, D.C.

**String Bass**

*Glenn A. Dewey*, Adjunct Associate Professor. BM, University of Illinois; MM, Northwestern University; bassist, U.S. Marine Band of Washington, D.C.; former double/electric bass instructor, Millikin University.

**Trombone**

*Matthew Neff*, Adjunct Assistant Professor. BS, MEd, Pennsylvania State University; MM, Catholic University; bass trombonist, U.S. Navy Band.
Harry Watters, Adjunct Associate Professor, Jazz Trombone. BM, University of North Texas; MM, University of New Orleans; United States Army Band-Army Blues; United States Army Band-Brass Quintet; Yamaha clinician.

Trumpet

Stanley Curtis, Adjunct Associate Professor. BM, University of Alabama; MM, Cleveland Institute of Music; trumpeter, U.S. Navy Band.

Dennis Edelbrock, Adjunct Professor. BME, University of Iowa; MA, DMA, Catholic University of America; trumpeter, U.S. Army Band of Washington, D.C., and National Gallery Orchestra.

Kenneth Rittenhouse, Adjunct Assistant Professor, Jazz Trumpet. BA, Performance, West Virginia Wesleyan College; MM, Jazz Studies, University of Maryland; additional graduate study, Eastman School of Music; member of the United States Army “Blues” Jazz Ensemble in Washington, D.C.; performs regularly with the Smithsonian Jazz Masterworks Orchestra.

Tuba

Roger Behrend (see Euphonium).

Viola

Edwin Johonnott, Adjunct Professor. Former violinist, National Symphony Orchestra. Studied at Indiana University and Illinois University.

Ramon Scavelli, Adjunct Associate Professor. Philadelphia Musical Academy; violist, National Symphony Orchestra.

Violin

James E. Gardner, Professor and Chair, Department of Music. BM, Oklahoma City University; MM, DMA, Southwestern Baptist Theological Seminary.

Peter Haase, Adjunct Professor. MM, State Conservatory of Music, Katowice, Poland; postgraduate studies, Moscow Conservatory and the Juilliard School; violinist, National Symphony Orchestra.

Edwin Johonnott (see Viola).

Voice

Samuel Bonds, Adjunct Associate Professor. Faculty member, Duke Ellington School for the Arts.

Carla Rae Cook, Adjunct Associate Professor. BM, University of Utah; MM, Boston University; Postgraduate Studies, Manhattan School of Music; performing dramatic mezzo-soprano.

Stanley Engebretson (see Conducting).

Kathryn Hearden-Botelho, Adjunct Professor. BM, St. Norbert College; MM, Performers Certificate, DMA, Eastman School of Music.

Laura Mann, Adjunct Professor. BM, MM, Eastman School of Music; DMA, University of Maryland.

Patricia Miller, Professor. BM, Boston University; MM, New England Conservatory; Artist Diploma, Accademia di Santa Cecilia (Rome); Advanced Vocal Studies, Mozarteum, Salzburg, Austria.
Seong Nam, Adjunct Assistant Professor. BM, Han-Yang University; MM, University of Maryland; chorus member, Washington National Opera; music director, Gyung Hyang Garden Presbyterian Church.

Richard Novak, Assistant Professor, Tenor. BM, MM, Stephen F. Austin University; DMA, University of North Texas; semifinalist-Metropolitan Opera National Council. Regional Auditions, Singer of the Year-National Association of Teachers of Singing; Wichita Grand Opera, Gilmore International Keyboard Festival, Monroe Symphony, the Living Opera, San Antonio Symphony, Des Moines Metro Opera, American Bel Canto Opera.

Debby Wenner, Adjunct Assistant Professor. BS, Frostburg State College; MM, George Washington University; graduate work, West Virginia University, Catholic University of America; former member, Metropolitan Opera Apprentice Program; performing mezzo-soprano.
## Course Information Directory

### Glossary

This section lists George Mason University’s undergraduate and graduate courses that are available for credit. Courses are listed in alphabetical order. The subject code for courses and the programs offering the courses are as follows:

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<thead>
<tr>
<th>Subject Code</th>
<th>Subject Name</th>
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<tbody>
<tr>
<td>ACCT</td>
<td>Accounting</td>
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<td>ADJ</td>
<td>Administration of Justice</td>
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<td>EDAL</td>
<td>Adult Education</td>
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<td>African American Studies</td>
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<td>EDAE</td>
<td>Alternative Education</td>
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<td>ANTH</td>
<td>Anthropology</td>
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<td>ARAB</td>
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<td>Art and Visual Technology</td>
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<td>Arts Management</td>
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<td>ASTR</td>
<td>Astronomy</td>
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<td>ATEP</td>
<td>Athletic Training Education Program</td>
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<td>BAIS</td>
<td>Bachelor of Arts in Interdisciplinary Studies</td>
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<td>BIS</td>
<td>Bachelor of Individualized Study</td>
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Nanotechnology  NANO
Neurosciences  NEUR
New Century College  NCLC
Nursing  NURS
Operations Management  OM
Operations Research  OR
Parks, Recreation, and Leisure Studies  PRLS
Philosophy  PHIL
Physical Education  PHED
Physical Sciences  PSCI
Physics  PHYS
Psychology  PSYC
Public Administration  PUAD
Public Policy  PUBP
Reading Education  EDRD
Religious Studies  RELI
Russian  RUSS
School of Management  SOM
Social Work  SOCW
Sociology  SOCI
Sociology and Anthropology  SOAN
Software Engineering  SWE
Spanish  SPAN
Special Education  EDSE
Sport Management  SPMT
Statistics  STAT
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<td>Women and Gender Studies</td>
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**Semester Notation**

Some course descriptions include one of the following semester notations. Although circumstances may cause a unit to deviate occasionally from these notations, students should use this information to plan their programs of study.

- **f**: usually available only in the fall semester
- **f, sum**: available only in fall and summer
- **f, s, sum**: usually available every semester
- **af, as**: offered only in alternate fall or spring semesters
- **ay**: offered only in alternate years
- **ir**: offered on an irregular basis at the discretion of the department or school

**Course Numbering**

**General Information**

Course titles are followed by numbers in parentheses (0:0:0), separated by colons. The first number refers to the number of credits; the second number, hours of lecture or seminar per week; and the third number, hours of laboratory or studio per week. For independent study, readings, topics, or similar courses, individual instructors set hours.

**Undergraduate**

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. The number designations of the course descriptions in this chapter have the following significance:

- A single number (HIST 301) indicates the course is complete within a single semester, and the semester course may be taken separately with credit toward a degree.
- A double number separated by a comma indicates that the subject matter or content of the course extends through two
semesters, but that either semester may be taken by itself. Unless otherwise specified, the first semester is not prerequisite to the second semester

**Graduate**

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
Courses
Reading Course Descriptions

ACCT 203 - Survey of Accounting

Credits: 3

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.

Prerequisites
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 301 - Financial Accounting and Managerial Decision Making

Credits: 3

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.

Prerequisites
Grade of C or higher in ACCT 203 or equivalent, 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.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0
When Offered
Fall, Spring, Summer.

ACCT 311 - Managerial and Cost Accounting

Credits: 3
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.

Prerequisites
Degree status, grade of B minus or higher in ACCT 301.

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 331 - Intermediate Financial Accounting I

Credits: 3
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.

Prerequisites
Degree status, grade of B minus or higher in ACCT 301.

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 332 - Intermediate Financial Accounting II

Credits: 3
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.

Prerequisites
Degree status, grades of C or higher in ACCT 331 and FNAN 301.

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.

ACCT 351 - Taxation and Managerial Decision Making

Credits: 3
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.

Prerequisites
Degree status, grade of C or higher in ACCT 331.

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
ACCT 361 - Accounting Information Systems

Credits: 3
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.

Prerequisites
Degree status, grade of B minus or higher in ACCT 301.

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
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.

Prerequisites
Degree status, grade of C or higher in ACCT 331.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

ACCT 382 - Financial Analysis and the Business Life Cycle

Credits: 3
Uses multidisciplinary approach to analyze major events in the financial lifecycle of business firms. Topics include start-up activities such as obtaining venture capital and selecting the appropriate business form; high-growth transactions such as stock-option arrangements and initial public offerings; complex corporate structure issues including mergers and alliances; multijurisdictional operations, especially consolidated financial statements, foreign tax credits, currency translations, and currency hedges; downsizing the firm via spin-offs, divestitures, plant closings, and asset sales; and bankruptcy proceedings, including loan workouts.

Prerequisites
Degree status, grade of B minus or higher in ACCT 301.
ACCT 411 - Advanced Managerial Accounting

Credits: 3
Managerial uses of accounting information in planning, controlling, motivating, and decision making. Emphasizes quantitative and behavioral aspects of managerial accounting.

Prerequisites
Degree status, grade of C or higher in ACCT 311.

ACCT 433 - Advanced Financial Accounting

Credits: 3

Prerequisites
Degree status, grade of C or higher in ACCT 332.

ACCT 451 - Advanced Federal Taxation

Credits: 3
Federal taxation of corporations, partnerships, fiduciaries, and gratuitous transfers.

Prerequisites
Degree status, grade of C or higher in ACCT 351.
ACCT 461 - Assurance and Audit Services

Credits: 3
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.

Prerequisites
Degree status, grades of C or higher in ACCT 331 and 361.

ACCT 462 - Honors Seminar in Accounting

Credits: 3
An in-depth study and analysis of contemporary developments and topics of interest in accounting.

Prerequisites
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
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.

Prerequisites
Degree status, grade of C or higher in ACCT 331.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0
When Offered
Fall, Spring.

ACCT 491 - Seminar in Accounting

Credits: 3
Advanced study of accounting concepts and selected topics.

Prerequisites
Degree status, grade of C or higher in ACCT 331.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

ACCT 499 - Independent Study

Credits: 1-3
Research and analysis of selected problems or topics in accounting.

Prerequisites
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
0
Hours of Lab or Studio per week
0

ACCT 741 - Information Technology Auditing
Credits: 3  
**Cross-Listed with MBA 741**

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.

**Prerequisites**  
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

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**ACCT 742 - Corporate Governance and Ethics**

Credits: 3  
**Cross-Listed with MBA 742**

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.

**Prerequisites**  
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

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**ACCT 743 - Corporate Financial Reporting**

Credits: 3  
**Cross-Listed with MBA 743**

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.

**Prerequisites**  
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
**ACCT 744 - Fraud Deterrence and Detection**

Credits: 3  
**Cross-Listed with MBA 744**

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.

**Prerequisites**  
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 796 - Independent Studies/Directed Readings**

Credits: 1-3  
Research and analysis of selected problems or topics in accounting not otherwise available in curriculum.

**Prerequisites**  
Permission of instructor.

**Notes**  
Approval of faculty member and program director required. May be repeated for up to 3 credits.

**Hours of Lecture or Seminar per week**  
0

**Hours of Lab or Studio per week**  
0

**ADJ 100 - Introduction to Criminal Justice**

Credits: 3  
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.

**Hours of Lecture or Seminar per week**  
3
ADJ 300 - Research Methods and Analysis

Credits: 4
Students are strongly encouraged to take ADJ 300 before or during the first semester of enrolling in 300-level courses. Emphasizes asking clear, researchable questions and using appropriate evidence to answer them. Students learn to use a broad range of evidence, including quantitative and qualitative information. Covers design and analysis of surveys, government archives, case studies, and interpretations of events in journals. Examines ethical implications of information technologies.

Prerequisites
ADJ 100. Required for all ADJ majors.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
1

ADJ 301 - Public Law and the Judicial Process

Credits: 3
Covers American judicial organization and operation, role of the Supreme Court in policy formation, and selected constitutional principles.

Prerequisites
ADJ 100.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

ADJ 302 - Delinquency

Credits: 3
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.

Prerequisites
ADJ 100 and SOCI 101, or permission of instructor

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0
ADJ 303 - Experiencing the Criminal Justice System

Credits: 3
Experiential learning course designed to give preservice ADJ students a firsthand, practical journey through the criminal justice process and system.

Prerequisites
ENGL 302; COMM 100, 101, or 104; and 60 credits.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

ADJ 304 - Computer Crime, Forensics, and Auditing

Credits: 3
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.

Prerequisites
IT 103 and 223.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

ADJ 305 - Crime and Crime Policy

Credits: 3
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 at the individual, neighborhood, and structural levels. Considers policies intended to reduce crime.

Prerequisites
ADJ 100.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0
ADJ 306 - Criminal Justice Ethics

Credits: 3
Analyzes ethical principles relevant for those working in criminal justice.

Prerequisites
60 credits, or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

ADJ 307 - Social Inequality, Crime, and Justice

Credits: 3
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.

Prerequisites
ADJ 100.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

ADJ 308 - Human Rights and Justice

Credits: 3
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.

Prerequisites
ADJ 100.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

ADJ 400 - Applied Criminal Psychology
Credits: 3
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.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**ADJ 401 - Policing in America**

Credits: 3
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.

**Prerequisites**
ADJ 100.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**ADJ 402 - Punishment and Corrections**

Credits: 3
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.

**Prerequisites**
ADJ 100.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**ADJ 403 - Community Corrections**

Credits: 3
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.
Prerequisites
ADJ 100

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

ADJ 404 - Crime Victims and Victimization

Credits: 3
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.

Prerequisites
ADJ 100.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

ADJ 405 - Law and Justice around the World

Credits: 3
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.

Prerequisites
ADJ 100.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

ADJ 406 - Family Law and the Justice System

Credits: 3
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.

Prerequisites
ADJ 100.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

ADJ 407 - Law and Society

Credits: 3
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. Considers different approaches to the study of law and society, and assesses methodologies.

Prerequisites
ADJ 100 or GOVT 301.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

ADJ 408 - Criminal Courts

Credits: 3
Studies the workings, advantages, and frailties of criminal courts, and explores whether the system works effectively and efficiently.

Prerequisites
ADJ 100 or GOVT 301.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

ADJ 409 - Community Policing

Credits: 3
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.

Prerequisites
ADJ 100.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0
ADJ 422 - Controversial Legal Issues

Credits: 3
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.

Prerequisites
ADJ 100.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

ADJ 423 - Constitutional Law: Civil Rights and Liberties

Credits: 3
Studies First Amendment freedoms of speech, press, assembly, association, and religion; the right to privacy; and Fourteenth Amendment right to equal protection.

Prerequisites
GOVT 103

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

ADJ 424 - Constitutional Law: Criminal Process and Rights

Credits: 3
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.

Prerequisites
GOVT 103.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0
ADJ 425 - Criminal Justice Management

Credits: 3
Explains the management function for current and future criminal justice managers. Emphasizes communication, motivation, leadership skills, and organizational development.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

ADJ 460 - Surveillance and Privacy in Contemporary Society

Credits: 3
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.

Prerequisites
ADJ 100.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

ADJ 461 - Introduction to Homeland Security

Credits: 3
Examines governmental actions designed to prevent, detect, respond to, and recover from acts of terrorism and national disasters. Focuses on efforts to align federal, state, local, tribal, private sector, and nongovernmental preparedness, incident management, and emergency response plans into the effective and efficient national structure necessary for the protection of the United States.

Prerequisites
ADJ 100.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

ADJ 462 - Law Enforcement and Homeland Security

Credits: 3
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
The entire framework of homeland security in the United States and the unique issues faced by local law enforcement.

**Prerequisites**
ADJ 100.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**ADJ 471 - Prevention and Deterrence of Crime**

Credits: 3  
**Cross-Listed with** SOCI 471

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.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**ADJ 475 - Theory and Politics of Terrorism**

Credits: 3

Explores origins of terrorism, tracing development from early states to a modern mode of conflict. Presents national, regional, and global perspectives.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**ADJ 479 - Preparation for Internship**

Credits: 3

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.

**Prerequisites**
ADJ 100, 300, 303; and at least 21 credits of other upper-level courses required for the ADJ major.

**Hours of Lecture or Seminar per week**
3
**ADJ 480 - Internship in Justice Administration**

Credits: 3-12
Application of classroom learning to an applied justice setting. Students maintain daily journals, conduct research, and deliver written and oral reports.

**Prerequisites**
ADJ 479.

**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 50 hours of on-the-job work time required for each credit. Students may take the course for 3, 6, or 9 credits. Course may be taken more than once, but total accumulated credits may not exceed 12. Students using the internship to satisfy skills for the justice professional must accumulate a total of 9 credits.

**ADJ 490 - Special Topics in Administration of Justice**

Credits: 1-3
Recent developments in the field.

**Notes**
Content varies. Recent topics covered workplace violence and international terrorism. May be repeated for credit four times.

**ADJ 491 - Honors Seminar I**

Credits: 3
Course includes readings, individual or group projects, and discussion of seminar papers.

**Prerequisites**
Admission to the ADJ honors program.

**Notes**
First of a two-course sequence; subject varies.
**ADJ 492 - Honors Seminar II**

Credits: 3  
Course includes readings and discussion of seminar papers, leading to a research project under the direction of a faculty member.

**Prerequisites**  
ADJ 491.

**Notes**  
Second of a two-course sequence. Subject varies. Oral exam on the research and report may be required.

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**ADJ 499 - Independent Study in Administration of Justice**

Credits: 1-3  
Reading and research on a specific topic under the direction of a faculty member.

**Prerequisites**  
ADJ 100.

**Notes**  
Open to majors in ADJ and public and international affairs, with 90 credits and permission of instructor and program. 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.

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**AFAM 200 - Introduction to African American Studies**

Credits: 3  
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.
AFAM 390 - Special Topics in African and African American Studies

Credits: 3
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.

AFAM 490 - Internship

Credits: 3
Prerequisites
AFAM 200 and 60 credits.

Notes
Credit to be determined by the African American Studies Program.

AFAM 499 - Independent Study

Credits: 1-3
Investigation of an area related to African American studies according to individual interest, with emphasis on research.

Prerequisites
Undergraduate senior status and permission of the director.

ANTH 114 - Introduction to Cultural Anthropology
Credits: 3
Overview of major ideas and approaches in the study of cultures around the world. Surveys kinship, social organization, political economy, religious beliefs, and other aspects of non-Western cultures.

Notes
For non-Western credit.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

ANTH 120 - Introduction to Archaeology

Credits: 3
Introduction to survey of anthropological archaeology. Includes development and use of contemporary theory, and field and lab methods.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

ANTH 135 - Becoming Human: Evolution, Cognition, and Culture

Credits: 3
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.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

ANTH 299 - Independent Study

Credits: 1-3
Individual study in anthropology on topic organized in advance by student and instructor.

Prerequisites
ANTH 114, or permission of instructor.

Hours of Lecture or Seminar per week
0

Hours of Lab or Studio per week
0
ANTH 300 - Civilizations

Credits: 3
Cross-cultural and transtemporal examination of complex societies and civilizations. Explores developmental schema for rise, articulation, spread, and decline of historic and contemporary civilizations.

Prerequisites
ANTH 114, 60 credits, or permission of instructor.

Notes
For non-Western credit.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

ANTH 301 - Native North Americans

Credits: 3
Exploration of native North American cultures and selected aspects of Indian-white historical relations. Emphasizes cultural persistence as well as change.

Prerequisites
ANTH 114, 60 credits, or permission of instructor

Notes
For non-Western credit.

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
Examines Latin American cultures and selected aspects of historical record.

Prerequisites
ANTH 114, 60 credits, or permission of instructor.

Notes
For non-Western credit.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

ANTH 303 - Peoples and Cultures of Selected Regions

Credits: 3
Examines cultures of a specific region such as Middle East, Amazonia.

Prerequisites
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 304 - Peoples and Cultures of the Pacific

Credits: 3
Survey of 20th-century Melanesian, Polynesian, and Micronesian cultures. Case studies of interplay between cultural systems and island ecology.

Prerequisites
ANTH 114, 60 credits, or permission of instructor.

Notes
For non-Western credit.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

ANTH 305 - Foraging Societies

Credits: 3
Examines early human societies with emphasis on environmental, technological, and cultural aspects of hunting and gathering as a successful means of adaptation.

Prerequisites
60 credits, 6 credits of anthropology including ANTH 120, or permission of instructor.

Notes
For non-Western credit.

Hours of Lecture or Seminar per week
3
**ANTH 306 - Peoples and Cultures of Island Asia**

Credits: 3  
Examines cultures of the Island Asia culture region, focusing on native cultures of Indonesia, Borneo, and the Philippines.

**Prerequisites**  
ANTH 114, 60 credits, or permission of instructor.

**Notes**  
For non-Western credit.

**Hours of Lecture or Seminar per week**  
3

**Hours of Lab or Studio per week**  
0

**ANTH 307 - Ancient Mesoamerica**

Credits: 3  
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.

**Prerequisites**  
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 308 - Peoples and Cultures of the Middle East**

Credits: 3  
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.

**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
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.

Prerequisites
ANTH 114 and 60 credits, or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

ANTH 310 - Social Organization and Kinship

Credits: 3
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.

Prerequisites
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 311 - Peoples and Cultures of Mainland Southeast Asia

Credits: 3
Survey of societies of mainland Southeast Asia, with emphasis on successive waves of outside cultural influences and relations between contrasting ethnic groups in modern states. Focuses on Thailand and Malaysia.

Prerequisites
ANTH 114, 60 credits, or permission of instructor.

Notes
For non-Western credit.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0
ANTH 312 - Political Anthropology

Credits: 3
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.

Prerequisites
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
Examines religion as a cultural system. Topics include mythology, ritual, symbolism, and dogma. Emphasizes cross-cultural and predominantly non-Western material.

Prerequisites
ANTH 114, 60 credits, or permission of instructor.

Notes
For non-Western credit.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

ANTH 315 - Socialization Processes: Family, Childhood, Personality in Cross-Cultural Perspective

Credits: 3
Examines aspects of the cultural transmission process in specific local cultures selected from various world culture regions, with emphasis on transmission of cultures.

Prerequisites
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 322 - Historical Archaeology

Credits: 3
Examines materials, theories, and methods of archaeology derived from and applied to historical sites, as they complement archival records.

Prerequisites
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 324 - Warfare, Violence, and Sacrifice in Antiquity

Credits: 3
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.

Prerequisites
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
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.

Prerequisites
ANTH 120, 60 credits, or permission of instructor.

Notes
May be repeated for maximum 6 credits.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
0

ANTH 330 - Peoples and Cultures of Selected Regions: Non-Western
Credits: 3  
Examines cultures of a specific region such as Africa and the Middle East. Focuses primarily on non-Western cultures.

**Hours of Lecture or Seminar per week**  
3  

**Hours of Lab or Studio per week**  
0

**ANTH 331 - Refugees**

Credits: 3  
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.

**Prerequisites**  
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 - Cultures in Comparative Perspective**

Credits: 3  
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.

**Prerequisites**  
ANTH 114, or permission of instructor.

**Notes**  
For non-Western credit and credit toward BA in sociology.

**Hours of Lecture or Seminar per week**  
3  

**Hours of Lab or Studio per week**  
0

**ANTH 333 - Humanitarian Action**

Credits: 3  
Examines humanitarian action, drawing on anthropology's holistic and comparative perspectives developed to ground understanding of humanitarian action within larger cultural contexts. Attention to cultural, biological, environmental, and political sources of humanitarian crises, and actual and potential responses to them. Focuses on large-scale response to social emergencies as culturally informed behavior.
Prerequisites
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 340 - Comparative Perspectives on Immigration

Credits: 3
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
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.

Prerequisites
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
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.

Prerequisites
ANTH 135, 60 credits, or permission of instructor.

Hours of Lecture or Seminar per week
ANTH 370 - Environment and Culture

Credits: 3
Examines relationships among environment, culture, and human behavior with an emphasis on cultural ecological explanations in mainly non-Western contexts.

Prerequisites
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
Survey of issues in study of relationships between cultural and psychological variables. Major topics viewed cross-culturally include personality, mental illness, projective systems, cognition, and learning.

Prerequisites
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 - Anthropological Perspectives on History

Credits: 3
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.

Prerequisites
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 380 - Language and Culture

Credits: 3
Anthropological analyses of language behavior, origins, and change, emphasizing interplay of language, culture, anthropology, and linguistics.

Prerequisites
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 381 - Health, Healing, and Culture

Credits: 3
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.

Prerequisites
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 382 - Urban Anthropology

Credits: 3
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.

Prerequisites
ANTH 114 and 60 credits, or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

ANTH 385 - Gender, Class, and Ethnicity in Latin America
Credits: 3
Examines 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.

Prerequisites
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 390 - Theories, Methods, and Issues I

Credits: 3
First of a two-course sequence that reviews the major theoretical traditions and schools of thought in anthropology.

Prerequisites
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
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.

Prerequisites
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
ANTH 399 - Issues in Anthropology

Credits: 3
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.

Prerequisites
ANTH 114 and 60 credits, or permission of instructor.

Notes
May be repeated for credit.

ANTH 400 - Engaging the World: Anthropological Perspectives

Credits: 3
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, the environment, and migration. Student papers and oral presentations receive formal review by multiple faculty members, to which the students must then respond. Satisfies general education synthesis requirement.

Prerequisites
ANTH 114, 60 credits, completion of all general education requirements, or permission of instructor.

ANTH 410 - Research Design and Methods in Bioanthropology
Credits: 3
Research design in bioanthropology and archaeology. Topics include critique of case studies, framing problems, field strategies, measuring variables, sampling, analysis, and interpretation of results.

Prerequisites
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
Explores theoretical and methodological issues in archaeology. Considers patterns and contexts of archaeological remains, analytic problems, and interpretation of material culture.

Prerequisites
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
Considers public significance of archaeology and anthropological contributions to public concerns such as antiquities legislation and cultural resource management.

Prerequisites
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
Explores demographic, stylistic, and religious aspects of historic cemeteries. Students learn to survey, record, and analyze gravestone data through field projects.

Prerequisites
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
Explores diversity of prehistoric cultures in light of major cultural development: hunting-gathering, agriculture, pastoralism, and complex societies.

**Prerequisites**
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
Studies archaeological research process through discussions of current archaeological methodologies and student participation in designing and critiquing research projects.

**Prerequisites**
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
Lab or field project leading to a written report of the research.

**Prerequisites**
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**
ANTH 436 - Special Projects: Archaeology and Biological Anthropology

Credits: 1-3
Lab or field project leading to a written report of the research.

Prerequisites
ANTH 120 or 135, 60 credits, and permission of instructor.

Notes
Research and paper completed under instructor's guidance.

ANTH 440 - Public Anthropology: Seeking Solutions in the Public and Private Sectors

Credits: 3
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.

Prerequisites
ANTH 114, 60 credits, or permission of instructor.

ANTH 450 - Qualitative Methods: Nonstatistical Approaches in Culture and Social Research

Credits: 3
Explores some of the most useful nonquantitative research techniques in social sciences and offers practice in their application.

Prerequisites
60 credits and 6 credits of anthropology including ANTH 114, or permission of instructor.
ANTH 488 - Gender, Sexuality, and Culture

Credits: 3
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.

Prerequisites
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 490 - Theories, Methods, and Issues II

Credits: 3
Second of a two-course sequence that reviews major theoretical traditions and schools of thought in anthropology.

Prerequisites
60 credits and 9 credits of anthropology, 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
Examines recent important works, issues, and controversies in anthropology.

Prerequisites
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: 3-6
Supervised project in applying anthropology: public archaeology, development anthropology, museums.

Prerequisites
ANTH 120, 60 credits, or permission of instructor.

Notes
May be repeated for maximum 6 credits.

Hours of Lecture or Seminar per week
0

Hours of Lab or Studio per week
0

ANTH 496 - On Evolution

Credits: 4
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.

Prerequisites
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: 1-3
Individual research on a topic to be organized in advance by student and instructor.

Prerequisites
60 credits, 9 credits of anthropology, or permission of instructor.

Notes
May be repeated for credit.

Hours of Lecture or Seminar per week
0

Hours of Lab or Studio per week
0

ANTH 535 - Anthropology and the Human Condition: Seminar I
Credits: 3
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.

Prerequisites
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
Examines contemporary theorists of anthropology, covering ongoing debates over epistemology and the multiple strands that inform anthropological theory and practice.

Prerequisites
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
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 560 - Human Osteology

Credits: 4
Examines structure and function of human skeletal system. Discussions include age criteria, pathology, epigenetic traits, biomechanics, and phylogenetic relationships.

Prerequisites
Course in human evolution or anatomy, and senior or graduate standing; or permission of instructor.
Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
3

ANTH 568 - Human Origins

Credits: 3
Detailed survey of the genetic, morphological, and behavioral origins of hominids. Discusses current interpretations and debates.

Prerequisites
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
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.

Prerequisites
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
Examines complex relationships among human cultures, biocultural adaptation, and the natural world from an evolutionary perspective.

Prerequisites
Graduate standing, or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0
ANTH 610 - Social Organization

Credits: 3
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.

Prerequisites
Graduate standing, or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

ANTH 613 - Ethnography

Credits: 3
Literally, "writing about (a) people," ethnography is the defining practice of social-cultural anthropology. The product of participant-observation field work, ethnography brings together evidence and interpretation, providing a key means for developing and testing theories of culture. Course surveys key classical and contemporary ethnographies, introducing the breadth and scope of ethnographic practice in anthropology. Discussions highlight methodological questions.

Prerequisites
Graduate standing, or permission of instructor.

Hours of Lecture or Seminar per week
0

Hours of Lab or Studio per week
3

ANTH 614 - Ethnopsychology: Self, Subject, and Culture

Credits: 3
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.

Prerequisites
Graduate standing, or permission of instructor.

Hours of Lecture or Seminar per week
0

Hours of Lab or Studio per week
3
ANTH 615 - Ritual and Power in Social Life

Credits: 3
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.

Prerequisites
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
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.

Prerequisites
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
Examines theoretical approaches in archaeology, paleoanthropology, and biological anthropology.

Prerequisites
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
Examines research strategies and methods in archaeology, paleoanthropology, and biological anthropology.

Prerequisites
Course in archaeology, or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

ANTH 630 - Anthropology and Humanitarian Action

Credits: 3
Examines humanitarian action from an anthropological perspective, with attention to the cultural, biological, environmental, and political dimensions of humanitarian crises and actual and potential responses.

Prerequisites
Graduate standing.

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
Explores major refugee flows since the mid-20th century, emphasizing mechanisms for providing assistance, asylum, and resettlement.

Prerequisites
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
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.
Prerequisites
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
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.

Prerequisites
Graduate standing, or permission of instructor.

Notes
May be repeated for credit when content differs.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

ANTH 640 - Applied Anthropology

Credits: 3
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.

Prerequisites
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
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.

**Prerequisites**
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
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.

**Prerequisites**
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
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.

**Prerequisites**
Graduate standing, or permission of instructor.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

## ANTH 660 - Social Science and Critical Theory

Credits: 3
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.
Prerequisites
Graduate standing, or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

ANTH 670 - Regional Studies in Archaeology

Credits: 3
Regional survey of specific culture area in archaeology to be chosen by student and instructor.

Prerequisites
Permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

ANTH 675 - Laboratory Techniques

Credits: 4
Covers techniques of data collection, analysis, and management in archaeology and biological anthropology.

Prerequisites
Course in archaeology, and permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
3

ANTH 677 - Anthropology and History

Credits: 3
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.

Prerequisites
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
Directed readings and research on a specific topic in archaeology to be chosen by student and instructor.

Prerequisites
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
Directed readings and research on a specific topic in biological anthropology chosen by student and instructor.

Prerequisites
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
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
ANTH 685 - Language and Culture

Credits: 3
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.

Prerequisites
Graduate standing, or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

ANTH 687 - Culture and Curing

Credits: 3
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.

Prerequisites
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: 1-6
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.

Prerequisites
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.
ANTH 699 - Contemporary Issues in Sociocultural Anthropology

Credits: 3
Explores current issues and debates in sociocultural anthropology.

Prerequisites
Graduate standing, or permission of instructor.

Notes
Variable topics.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

ANTH 710 - Contemporary Issues in Archaeology and Biological Anthropology

Credits: 3
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.

Prerequisites
ANTH 620 and 625, completion of 24 graduate credits, and approval of graduate advisor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

ANTH 721 - Culture, Power, and Conflict

Credits: 3
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.

Prerequisites
Graduate standing, or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0
ANTH 750 - Ethnographic Genres

Credits: 3
"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.

Prerequisites
Graduate standing, or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

ANTH 769 - Gender, Sexuality, and Culture

Credits: 3
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.

Prerequisites
Graduate standing, or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

ANTH 797 - Anthropology Colloquium

Credits: 1
Public forum for the presentation and discussion of contemporary anthropological research.

Prerequisites
Graduate standing in anthropology, or permission of graduate coordinator.

Hours of Lecture or Seminar per week
1

Hours of Lab or Studio per week
0

ANTH 798 - Thesis Proposal
Credits: 3-6
Work on research proposal that forms basis for master's thesis.

Prerequisites
Completion of 18 credits, including all core courses.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
0

ANTH 799 - Master's Thesis

Credits: 1-5
Master's thesis research and writing under direction of thesis committee.

Prerequisites
Completion of ANTH 798 and approval of thesis proposal.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
0

ARAB 101 - Introduction to the Arabic Language

Credits: 3

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
1

ARAB 102 - Introduction to the Arabic Language

Credits: 3

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.
Prerequisites
ARAB 101, or permission of instructor.

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
1

ARAB 110 - Elementary Arabic

Credits: 6
Introduces elements of grammar, vocabulary, oral skills, listening comprehension, and reading.

Notes
Lab work required. 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
1

ARAB 201 - Intermediate Arabic I

Credits: 3
Further development of listening, speaking, reading, and writing skills. Advanced level of vocabulary. Grammar covers past tenses, subordinated conjunctions, and introduction to passive voice.

Prerequisites
ARAB 102 or equivalent.

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
1

ARAB 202 - Intermediate Arabic II
Credits: 3
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.

Prerequisites
ARAB 201 or equivalent.

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
1

ARAB 210 - Intermediate Arabic

Credits: 3
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.

Prerequisites
ARAB 110 or appropriate placement score.

Notes
Lab work required. 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
1

ARAB 250 - Gateway to Advanced Arabic

Credits: 3
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.

Prerequisites
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
1
ARAB 325 - Major Arab Writers/Stories

Credits: 3
Studies works of major Arab writers or collections such as *The Arabian Nights*.

**Prerequisites**
ENGL 101 or permission of instructor

**Notes**
Writers and tales to be studied vary. Course work in English; knowledge of Arabic language helpful but not required. 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

ARAB 330 - Reading and Conversation I

Credits: 3
Development of conversational fluency and reading skills in modern standard Arabic through class discussion, reports, and presentations. Readings include selections from newspapers, journals, magazines, web sites, literary works, and other sources.

**Prerequisites**
ARAB 250, appropriate placement score or permission of instructor.

**Notes**
Courses I and II 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
Continuation of ARAB 330.

**Prerequisites**
ARAB 250 or equivalent; appropriate placement; or permission of instructor.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0
ARAB 380 - Special Topics: Arabic Dialects

Credits: 3
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. May be repeated once if dialect covered is different.

Prerequisites
ARAB 250, appropriate placement score, or permission of instructor

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

ARTH 101 - Introduction to the Visual Arts

Credits: 3
Introduction to the content and principles of the visual arts. Approach varies with instructor.

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
Themes and imagery in art from early Greece to the modern era.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

ARTH 103 - Introduction to Architecture

Credits: 3
Introduces study, principle, and understanding of art of architecture. Approach varies with instructor; may be historical, geographical, technical, or thematic.

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
Focuses on skills and methods of learning as well as subject matter as a way of introducing the discipline of art history.

Prerequisites
Freshman standing.

Notes
Topics vary.

3
Hours of Lecture or Seminar per week
0

ARTH 200 - Survey of Western Art

Credits: 3
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.

Notes
Designed as a two-course sequence, but each part may be taken independently without prerequisite.

3
Hours of Lecture or Seminar per week
0

ARTH 201 - Survey of Western Art

Credits: 3
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.

Notes
Designed as a two-course sequence, but each part may be taken independently without prerequisite.

3
ARTH 203 - Survey of Asian Art

Credits: 3
Introduces arts of South, Southeast, and east Asia. Examines aspects of culture and history of Asia. Discusses monuments and artifacts in a variety of media and their relation to social and historical contexts.

Notes
For non-Western credit.

ARTH 204 - Survey of Latin American Art

Credits: 3
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.

Notes
Each 300-level course is generally offered once every two years.

ARTH 303 - National Traditions

Credits: 1-3
Studies traditions of art and architecture within a single selected country or historical region.

Prerequisites
24 credits.

Notes
Topic varies. May be repeated for credit with different course content.
ARTh 311 - Design of Cities

Credits: 3
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.

Prerequisites
24 credits.

Notes
May be repeated when course content is different.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

ARTh 315 - Modern Architecture

Credits: 3
Studies in modern architecture from the Beaux Arts movement to the present; an investigation of stylistic, structural, or theoretical innovations.

Prerequisites
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
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.

Prerequisites
24 credits.

Notes
For non-Western credit.

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
Introduction to Islamic art, from the time of Muhammad to present. Cultural and regional approach, utilizing local museum collections.

Prerequisites
24 credits. For non-Western credit.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

ARTH 321 - Greek Art and Archaeology

Credits: 3
History of ancient Greek architecture, sculpture, and painting.

Prerequisites
24 credits.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

ARTH 322 - Roman Art and Archaeology

Credits: 3
History of Roman architecture, sculpture, and painting.

Prerequisites
24 credits.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

ARTH 324 - From Alexander the Great to Cleopatra: The Hellenistic World

Credits: 3
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.

Prerequisites
24 credits.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

ARTH 333 - Early Christian and Byzantine Art

Credits: 3
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.

Prerequisites
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
Aspects of art and architecture in medieval Europe, from the fall of the Roman Empire through the Gothic period.

Prerequisites
24 credits.

Notes
Specific focus may vary with instructor. May be repeated when course content is different.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

ARTH 340 - Early Renaissance Art in Italy, 1300-1500
Credits: 3
Studies in architecture, sculpture, and painting in the age of Giotto, Ghiberti, Masaccio, and Botticelli.

Prerequisites
24 credits.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

ARTH 341 - Northern Renaissance Art

Credits: 3
Studies in the art of France, Germany, and the Netherlands in the age of Van Eyck and Dürer.

Prerequisites
24 credits.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

ARTH 342 - High Renaissance Art in Italy, 1480–1570

Credits: 3
Studies in architecture, sculpture, and painting in the age of Leonardo, Michelangelo, Raphael, and Titian.

Prerequisites
24 credits.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

ARTH 344 - Baroque Art in Italy, France, and Spain, 1600–1750

Credits: 3
Studies in architecture, sculpture, and painting in the age of Caravaggio, Bernini, Velazquez, and Poussin.
Prerequisites
24 credits.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

ARTH 345 - Northern Baroque Art, 1600-1750

Credits: 3
Studies in architecture, sculpture, and painting in the age of Rubens, Van Dyck, Rembrandt, and Vermeer.

Prerequisites
24 credits.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

ARTH 350 - History of Photography

Credits: 3
Development of photography from origins in France in the 19th century to the present.

Prerequisites
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
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.

Prerequisites
24 credits.

Notes
May be repeated once for credit when topic differs.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

ARTH 360 - Nineteenth-Century European Art

Credits: 3
Movements from neoclassicism to symbolism discussed in relation to social, cultural, political, and technological changes in Europe.

Prerequisites
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
Study of major movements (fauvism, cubism, futurism, constructivism, surrealism, and expressionism) and important artists in 20th-century painting and sculpture.

Prerequisites
24 credits.

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
Studies in the history of American architecture or decorative arts in cultural context. Topics range from 17th century to 20th century, depending on instructor.

Prerequisites
24 credits.

Hours of Lecture or Seminar per week
3
**ARTH 372 - Studies in 18th- and 19th-Century Art of the United States**

Credits: 3  
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).

**Prerequisites**
24 credits.

**Notes**
May be repeated once for credit with different topic. Lecture, discussion.

**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  
Developments in 20th-century American visual culture across all media.

**Prerequisites**
24 credits

**Notes**
Focus may vary (postwar American "realisms," women artists, and feminist art). May be repeated once for credit with different topic. Lecture, discussion.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**ARTH 374 - Art Now**

Credits: 3  
Explores visual art production since 1980, drawing on regional resources. Examines social, institutional, and political issues in recent art and its markets.

**Prerequisites**
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
Major movements and important artists in 20th-century Latin American art discussed in relation to social, cultural, and political conditions in the region.

Prerequisites
24 credits.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

ARTH 380 - African Art

Credits: 3
Focuses on sub-Saharan African art in terms of styles and aesthetics; materials and techniques; and geographical, social, cultural, and religious contexts.

Prerequisites
24 credits.

Notes
For non-Western credit. Specific focus may vary with instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

ARTH 382 - Arts of India

Credits: 3
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.
Prerequisites
24 credits.

Notes
For non-Western credit.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

ARTH 383 - Arts of Southeast Asia

Credits: 3
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.

Prerequisites
24 credits.

Notes
For non-Western credit.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

ARTH 384 - Arts of China

Credits: 3
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.

Prerequisites
24 credits.

Notes
For non-Western credit.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

ARTH 385 - Arts of Japan
Credits: 3
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.

Prerequisites
24 credits.

Notes
For non-Western credit.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

ARTH 386 - The Silk Road

Credits: 3
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.

Prerequisites
24 credits.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

ARTH 393 - Art History Internships

Credits: 3-6
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.

Prerequisites
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
0
Hours of Lab or Studio per week
0
**ARTH 394 - The Museum**

Credits: 3  
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.

**Prerequisites**  
6 credits in art history at the 300-level, 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

**ARTH 399 - Special Topics in the History of Art**

Credits: 3  
Topics vary.

**Notes**  
At least one 400- or 500-level course is offered each semester; each topic area is generally offered every two years.

**Hours of Lecture or Seminar per week**  
3

**Hours of Lab or Studio per week**  
0

**ARTH 400 - Historiography and Methods of Research in Art History**

Credits: 3  
Historical investigation of theories, methods, and critiques involved in the discipline of art history. Approach or focus may vary with instructor.

**Prerequisites**  
ENGL 302, and 6 credits in art history at the 300 level; or 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

**ARTH 420 - Advanced Studies in Ancient Art**
Credits: 3
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.

**Prerequisites**
ENGL 302, and 300-level course in ancient art; or 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

**ARTH 430 - Advanced Studies in Medieval or Islamic Art**

Credits: 3
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.

**Prerequisites**
ENGL 302, and a 300-level course in medieval or Islamic art; or 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

**ARTH 440 - Advanced Studies in Renaissance and Baroque Art**

Credits: 3
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.

**Prerequisites**
ENGL 302, and 300-level course in Renaissance or baroque art; or 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
ARTH 460 - Advanced Studies in 20th-Century European Art

Credits: 3  
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.

Prerequisites  
ENGL 302 and 300-level course in the art of 19th- or 20th-century Europe or the Americas; or permission of instructor.

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  
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.

Prerequisites  
ENGL 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  
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.

Prerequisites  
ENGL 302 and 300 level course in 19th- or 20th-century art of Europe or the Americas, or permission of the instructor.

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
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.

Prerequisites
ENGL 302 and 300-level course work in modern or contemporary art, or permission of the instructor

Notes
Content varies; course may be repeated once for credit if topic varies.

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
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.

Prerequisites
ENGL 302, and 300-level course in any area of Asian art; or permission of instructor.

Notes
For non-Western credit. Content varies; course may be repeated for credit.

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
Intensive study of a particular artist, period, or theoretical problem to be conducted by an individual student in consultation with instructor. Study proposal submitted before registration.

Prerequisites
60 credits, ENGL 302, permission of instructor and chair, plus 9 credits in art history beyond ARTH 200, 201.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
0
**ARTH 491 - Independent Study in Art History**

Credits: 3  
Intensive study of a particular artist, period, or theoretical problem to be conducted by an individual student in consultation with instructor. Study proposal submitted before registration.

**Prerequisites**
60 credits, ENGL 302, permission of instructor and chair, plus 9 credits in art history beyond ARTH 200, 201.

**Hours of Lecture or Seminar per week**
0

**Hours of Lab or Studio per week**
0

**ARTH 492 - Honors Directed Readings, Honors Directed Research**

Credits: 3  
Linked individualized courses, usually given by same instructor. Involves directed readings.

**Prerequisites**
Admission to art history honors program, ENGL 302, and permission of instructor.

**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  
Linked individualized courses, usually given by same instructor. Culminates in research paper related to subject of readings.

**Prerequisites**
Admission to art history honors program, ENGL 302, and permission of instructor.

**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**
0

**ARTH 499 - Advanced Studies in Art History**
Credits: 3
Seminar-style discussion on specific subjects in art history.

Prerequisites
ENGL 302 and 300-level course, or permission of instructor.

Notes
For non-Western credit. Topics may vary. May be repeated for credit.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

ARTH 593 - Art History Internships

Credits: 3-6
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.

Prerequisites
Baccalaureate degree 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.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
0

ARTH 594 - The Museum

Credits: 3
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.

Prerequisites
Baccalaureate degree or equivalent, or permission of instructor.

Notes
Specific focus may vary with instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0
ARTH 596 - Independent Study

Credits: 1-3
Independent reading and research on specific project under direction of department member.

Prerequisites
Baccalaureate degree or equivalent, or permission of instructor.

Notes
Written report is required. May be repeated for credit.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
0

ARTH 599 - Special Topics in the History of Art

Credits: 3
Topics vary.

Prerequisites
Baccalaureate degree or equivalent, or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

ARTH 600 - Methods and Research in Art History

Credits: 3
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.

Prerequisites
Admission to the art history MA program.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

ARTH 696 - Independent Directed Readings
Credits: 3
Designed to prepare students for comprehensive exams by integrating past work and filling gaps in expected knowledge before the exam.

Prerequisites
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
0
Hours of Lab or Studio per week
0

ARTH 699 - Topics in Art History

Credits: 3
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.

Prerequisites
Graduate standing.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

ASTR 103 - Astronomy

Credits: 3
Introduction to origin of life, Earth, planets and sun, stars, galaxies, quasars, nature of space radiation, and general theory of relativity.

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
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.

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
Laboratory course associated with ASTR 111.

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
0
Hours of Lab or Studio per week
3

ASTR 113 - Introductory Astronomy: Stars, Galaxies, and the Universe

Credits: 3
Topics include electromagnetic radiation, stellar evolution, interstellar medium, galaxies, cosmology, scientific method, and critical thinking.

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
Laboratory course associated with ASTR 113.

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
0
ASTR 301 - Astrobiology

Credits: 3
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 search for extraterrestrial life.

Prerequisites
MATH 113 and PHYS 160.

ASTR 302 - Foundations of Cosmological Thought

Credits: 3
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.

Notes
No advanced background in mathematics or natural sciences required.

ASTR 328 - Introduction to Astrophysics

Credits: 3
Cross-Listed with PHYS 328
Topics include physical concepts; magnitudes of stars; Hertzsprung-Russell diagram; stellar radiation; stellar structure and evolution; white dwarfs, red giants, supernovas, neutron stars, and 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.

Prerequisites
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
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.

ASTR 401 - Computer Simulation in Astronomy

Credits: 3
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.

Prerequisites
MATH 213 and ASTR 328.

Notes
Emphasizes hands-on projects.

ASTR 402 - Methods of Observational Astronomy

Credits: 3
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.

Prerequisites
ASTR 111, 112, 113, 114.

Notes
This course meets the writing-intensive requirement.

**ASTR 403 - Planetary Sciences**

Credits: 3
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.

Prerequisites
MATH 213 and PHYS 160.

**ASTR 404 - Galactic Astronomy**

Credits: 3
Comprehensive introduction to observational and theoretical aspects of the study of galaxies. Topics include our own galaxy, normal galaxies and their hierarchical structures (groups and clusters), star forming and active galaxies, and colliding galaxies.

Prerequisites
MATH 214, ASTR 328, and PHYS 308.

**ASTR 408 - Senior Research**

Credits: 3
Independent work under guidance of faculty member on research project in experimental, observational, or theoretical astronomy.

Prerequisites
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
Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

ASTR 409 - Astronomy Internship

Credits: 3
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.

Prerequisites
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 and Cosmology

Credits: 3
Cross-Listed with PHYS 428

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.

Prerequisites
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 490 - Astronomy Capstone

Credits: 3
Capstone course providing a learning experience, integrating knowledge from previous astronomy courses with selected readings from current scientific papers and an opportunity to effectively present that synthesis. Emphasizes student participation and
student-led class discussions.

**Prerequisites**
Completion of ASTR core courses or concurrent enrollment in final core courses.

**Notes**
Required of all astronomy majors.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

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**ASTR 530 - Astrophysics**

Credits: 3
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.

**Prerequisites**
PHYS 303, 305, 308; MATH 214.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

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**ASTR 535 - Space Instrumentation and Exploration**

Credits: 3
**Cross-Listed with** CSI 660
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.

**Prerequisites**
PHYS 262 and MATH 213.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

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**ASTR 590 - Selected Topics in Astronomy and Astrophysics**
Credits: 1-6
Advanced topics from recent theoretical or observational developments and their applications. Satisfies needs of professional community to keep abreast of current developments.

Hours of Lecture or Seminar per week
0-6

Hours of Lab or Studio per week
0

ASTR 680 - Physics of Interstellar Media

Credits: 3
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.

Prerequisites
PHYS 402 or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

ASTR 703 - Planetary Sciences

Credits: 3
This course will cover the processes and events that have played a central role in the origin and evolution of the solar system, with special emphasis on the terrestrial planets. The unique history of Earth and how it has evolved into a habitable world will be covered in detail.

Prerequisites
MATH 213 and PHYS 160.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

ASTR 760 - Space Plasma Physics

Credits: 3
Cross-Listed with PHYS 760

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.
Prerequisites
PHYS 622 or 513, 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
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.

Prerequisites
PHYS 502 and 513, and ASTR 530; or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

ASTR 766 - Relativity and Cosmology

Credits: 3
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.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

ASTR 769 - Topics in Space Sciences

Credits: 3
Cross-Listed with CSI 769

Selected topics in space sciences not covered in fixed-content space sciences courses.

Prerequisites
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

ASTR 790 - Advanced Topics in Astronomy and Astrophysics

Credits: 1-6
Advanced topics from recent theoretical or observational developments and applications.

Prerequisites
Graduate standing and permission of instructor.

Notes
Satisfies need of professional community to keep abreast of current developments.

Hours of Lecture or Seminar per week
0-6
Hours of Lab or Studio per week
0

ASTR 796 - Directed Reading and Research

Credits: 1-6
Reading and research on a specific topic in astronomy, astrophysics, or related field under direction of faculty member.

Prerequisites
Admission to master's program and permission of instructor.

Notes
May be repeated as needed.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
0

ASTR 798 - Research Project

Credits: 3
Research project chosen and completed under guidance of graduate faculty member resulting in an acceptable technical report.

Prerequisites
9 credits and permission of instructor.

**Notes**
May not be repeated.

**Hours of Lecture or Seminar per week**
0

**Hours of Lab or Studio per week**
0

### ASTR 799 - Master's Thesis

Credits: 1-6  
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.

**Prerequisites**
9 credits, and permission of instructor.

**Notes**
May not be repeated.

**Hours of Lecture or Seminar per week**
0

**Hours of Lab or Studio per week**
0

### ASTR 998 - Doctoral Dissertation Proposal

Credits: 1-12  
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.

**Prerequisites**
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**
S/IP
ASTR 999 - Doctoral Dissertation

Credits: 1-12
Doctoral research performed under direction of dissertation director.

Prerequisites
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.

Hints of Lecture or Seminar per week
0

Hours of Lab or Studio per week
0

Grading
S/IP

ATEP 150 - Introduction to Athletic Training and Preventative Care Techniques

Credits: 3
This course presents an introduction to the profession of athletic training and to 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: 4
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.

Prerequisites
BIOL 124

Corequisite
BIOL 125

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
1

ATEP 250 - Physical Assessment of the Lower Body

Credits: 3
An analysis of the principles of physical assessment of the lower body.

Prerequisites
ATEP 150, 180; BIOL 124, 125; HEAL 110; PHED 300

Corequisite
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

ATEP 255 - Clinical Techniques I: Physical Assessment of the Lower Body

Credits: 3
An analysis of physical assessment clinical techniques of the lower body (including the lower extremity and abdomen).

Prerequisites
ATEP 150, ATEP 180, BIOL 124, BIOL 125, HEAL 110, and PHED 300

Corequisite
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

ATEP 256 - Practicum I: Physical Assessment of the Lower Body

Credits: 3
A clinical practicum filed experience under the direct supervision of an Approved Clinical Instructor (ACI) with emphasis on physical assessment of the lower body.

Prerequisites
ATEP 150, 180; BIOL 124, 125; HEAL 110; and PHED 300

Corequisite
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
An analysis of the principles of physical assessment of the upper body.

Prerequisites
ATEP 150, 180, 250, 255, 256; BIOL 124, 125; HEAL 110; PHED 300

Corequisite
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
An analysis of physical assessment clinical techniques of the upper body (including the upper extemity, head, and neck).

Prerequisites
ATEP 150, 180, 250, 255, 256; BIOL 124, 125; HEAL 110; and PHED 300

Corequisite
ATEP 260, 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 266 - Practicum II: Physical Assessment of the Upper Body

Credits: 3
A clinical practicum field experience under the direct supervision of an Approved Clinical Instructor (ACI) with emphasis on physical assessment of the upper body.

Prerequisites
ATEP 150, 180, 250, 255, 256, BIOL 124, BIOL 125, HEAL 110, and PHED 300

Corequisite
ATEP 260 and 265

Notes
Formal acceptance to the professional phase of the ATEP; Emergency Cardiac Care (ECC) Certification

ATEP 270 - General Medical Conditions and Pharmacology in Physically Active Populations

Credits: 3
An examination of assessment and management techniques of general medical conditions and pharmacological principles in physically active populations.

Prerequisites
ATEP 150 and 180; BIOL 124 and 125; HEAL 110 and 230; PHED 300

Notes
Formal acceptance to the professional phase of the ATEP

ATEP 350 - Therapeutic Modalities

Credits: 3
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.

Prerequisites
ATEP 150, ATEP 180, ATEP 250, ATEP 255, ATEP 256, ATEP 260, ATEP 265, ATEP 266, ATEP 270, BIOL 124, BIOL 125, HEAL 110, HEAL 230, and PHED 300

Corequisite
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
An examination of the scientific theory and standard operating procedures necessary for the safe application of therapeutic modalities in a physically active patient population.

Prerequisites
ATEP 150, 180, 250, 255, 256, 260, 265, 266, 270; BIOL 124, 125; HEAL 110, 230; PHED 300

Corequisite
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
A clinical practicum field experience under the direct supervision of an Approved Clinical Instructor (ACI) with emphasis on therapeutic modalities.

Prerequisites
ATEP 150, 180, 250, 255, 256, 260, 265, 266, 270; BIOL 124, 125; HEAL 110, 230; and PHED 300

Corequisite
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
A study of the indications, contradictions, physiological effects, special programs, and resistance methods that are used in the prevention and rehabilitation of athletic injuries.

Prerequisites
ATEP 365 - Clinical Techniques IV: Therapeutic Rehabilitation

Credits: 3

A study of the indications, contraindications, physiological effects, special programs, and resistance methods that are used in the prevention and rehabilitation of athletic injuries.

Prerequisites
Formal acceptance to the professional phase of the ATEP; ATEP 150, 180, 250, 255, 256, 260, 265, 266, 270, 350, 355, 356, BIOL 124 and 125; HEAL 110 and 230; PHED 300 and 450

Corequisite
Concurrent enrollment in ATEP 365 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

A clinical practicum field experience under the direct supervision of an Approved Clinical Instructor (ACI) with emphasis on therapeutic rehabilitation.

Prerequisites
ATEP 150, 180, 250, 255, 256, 260, 265, 266, 270, 350, 355, 356; BIOL 124, 125; HEAL 110 and 230; PHED 300 and 450

Corequisite
ATEP 360 and 365

Notes
Formal acceptance into the professional phase of the ATEP; Current Emergency Cardiac Care (ECC) Certification.
ATEP 441 - Practicum in Athletic Training

Credits: 3
Techniques and procedures in the care and prevention of athletic injuries in a selected environment under certified athletic trainer supervision.

Prerequisites
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

ATEP 450 - Administration and Management in Athletic Training

Credits: 3
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.

Prerequisites
ATEP 150, 180, 250, 255, 256, 260, 265, 266, 270, 350, 355, 360, 365, 366; BIOL 124, 125; HEAL 110, 230; PHED 300 and 450

Corequisite
ATEP 456

Notes
Formal acceptance into the professional phase of the ATEP.

ATEP 456 - Practicum V: Professional Integration
Credits: 6
A clinical practicum field experience under the direct supervision of an Approved Clinical Instructor (ACI) with emphasis on professional skill integration.

Prerequisites
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
ATEP 450

Notes
Formal acceptance into the professional phase of the ATEP; Current Emergency Cardiac Care (ECC) Certification.

Hours of Lecture or Seminar per week
6
Hours of Lab or Studio per week
0

AVT 101 - New Majors Colloquium

Credits: 1
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
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.

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
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.

Hours of Lecture or Seminar per week
2
Hours of Lab or Studio per week
4

AVT 105 - Studio Fundamentals II

Credits: 4
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.

Prerequisites
AVT 104 or permission of instructor.

Hours of Lecture or Seminar per week
2
Hours of Lab or Studio per week
4

AVT 180 - Computers in the Creative Arts

Credits: 3
Introduces computing from artist's perspective. Emphasizes computer use for artistic creation and research. Overview of hardware, software, operating systems, peripherals, two-dimensional graphics, and web design.

Hours of Lecture or Seminar per week
1
Hours of Lab or Studio per week
2

AVT 204 - Visual Thinking

Credits: 3
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.
AVT 206 - Color

Credits: 4
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.

Prerequisites
AVT 104 or permission of instructor.

AVT 215 - Typography

Credits: 4
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.

Prerequisites
AVT 104 and 180, or permission of instructor.

AVT 222 - Drawing I

Credits: 4
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.

Notes
AVT majors encouraged to take AVT 222 with AVT 104.
AVT 232 - Painting I

Credits: 4

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.

AVT 243 - Printmaking I

Credits: 4

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.

AVT 252 - Photography I

Credits: 4

Introduction to basic principles and aesthetics of photography, 35-mm camera operation, and darkroom practices, including film processing and print development. Students learn constructive analytical techniques of photography, and explore their personal tastes and judgements as they broaden their artistic development.

AVT 253 - Introduction to Digital Photography
Credits: 4
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.

**Hours of Lecture or Seminar per week**
2

**Hours of Lab or Studio per week**
4

**AVT 262 - Sculpture I**

Credits: 4
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.

**Hours of Lecture or Seminar per week**
2

**Hours of Lab or Studio per week**
4

**AVT 272 - Interdisciplinary Arts**

Credits: 4
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.

**Hours of Lecture or Seminar per week**
4

**Hours of Lab or Studio per week**
2

**AVT 280 - Introduction to Digital Arts**

Credits: 4
Investigates ways in which contemporary artists employ tools of digital culture. Students create meaningful works of art that demonstrate conceptual awareness and technical skill.

**Prerequisites**
AVT 104 and 180, or permission of instructor.

**Hours of Lecture or Seminar per week**
2

**Hours of Lab or Studio per week**
4
AVT 300 - Artsbus Attendance

Credits: 0
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
0

Hours of Lab or Studio per week
0

Grading
S/NC

AVT 301 - Visual Voices Colloquium

Credits: 1
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
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
Credits: 3
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.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

AVT 309 - Art as Social Action

Credits: 3
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.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

AVT 311 - Graphic Design Methods and Principles

Credits: 4
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.

Prerequisites
AVT 215 or permission of instructor.

Hours of Lecture or Seminar per week
2

Hours of Lab or Studio per week
4

AVT 313 - Editorial Design

Credits: 4
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.

Prerequisites
AVT 311 or permission of instructor.

Hours of Lecture or Seminar per week
AVT 318 - History of Graphic Design

Credits: 3
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

AVT 323 - Drawing II

Credits: 4
Students develop observational, sketching, and rendering skills. Introduction to a range of materials, methods, formal concepts, drawing in series, and critique vocabulary.

Prerequisites
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
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.

Prerequisites
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
This course 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.

**Prerequisites**
AVT 222 or permission of instructor.

**Hours of Lecture or Seminar per week**
2

**Hours of Lab or Studio per week**
4

### AVT 333 - Painting II

Credits: 4
Course focuses on the development of formal and technical skills, with an emphasis on paint application, color interaction, and support building and preparation. Concepts, methodologies, and approaches relevant to contemporary painting are introduced.

**Prerequisites**
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
Using contemporary painting practices as starting place, students explore a variety of experimental and conceptual approaches to painting.

**Prerequisites**
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
Working primarily with live models, students explore the human form as the main subject for a variety of visual and expressive inquiries.

**Prerequisites**
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
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.

Prerequisites
AVT 243 or permission of instructor.

Hours of Lecture or Seminar per week
2
Hours of Lab or Studio per week
4

AVT 345 - Artists' Books as Visual Language

Credits: 4
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.

Prerequisites
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
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.

Prerequisites
AVT 180 or permission of the instructor.

Hours of Lecture or Seminar per week
2
AVT 353 - Photography II

Credits: 4
With further investigation into the aesthetics of photography through experimentation with new films, developers, papers, and development of a portfolio of photographic images.

Prerequisites
AVT 252 or permission of instructor.

Notes
Continuation of Photography I.

AVT 354 - Digital Photo

Credits: 4
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.

Prerequisites
AVT 252 and 180, or permission of the instructor.

AVT 356 - Studio Lighting I

Credits: 4
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.

Prerequisites
AVT 353 or permission of instructor.
AVT 363 - Sculpture II

Credits: 4
Expands on the principles and processes introduced in Sculpture I, developing a higher level of technical competence and critical sophistication.

Prerequisites
AVT 262 or permission of instructor.

Notes
Lectures, independent student research, and gallery and museum visits required. Vigorous critiques.

Hours of Lecture or Seminar per week
2
Hours of Lab or Studio per week
4

AVT 370 - Entrepreneurship in the Arts

Credits: 4
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
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
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
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.

Prerequisites
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 and Vision

Credits: 4
Explores the function and use of sound in conjunction with time-based media and installation. Students learn digital tools for selection, editing, processing, and integration of sound and music (postproduction) into video, animation, and installation projects.

Prerequisites
AVT 180 or 280, or permission of instructor.

Hours of Lecture or Seminar per week
2

Hours of Lab or Studio per week
4

AVT 376 - Live Movies

Credits: 4
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.

Prerequisites
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
Traces the ways that cinema, music, fiction, cultural theory, visual art, television, theater, and performance have embraced and been shaped by cyberpunk and cybertulture. 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
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 - Digital Art and Animation

Credits: 4
Introduces conceptual, technical, and aesthetic practices of two-dimensional computer animation. Students learn to animate hand-drawn and computer-generated images. Students work to develop and create an imaginative and meaningful short animation with sound.

Prerequisites
AVT 280 or permission of instructor.

Hours of Lecture or Seminar per week
2
Hours of Lab or Studio per week
4
AVT 383 - Three-Dimensional Digital Art

Credits: 4
Students create thoughtful and imaginative, three-dimensional scenes with scaled objects, surface textures, lights, and shadows. These scenes serve as environments for short animations. Emphasis on idea generation, contemporary practices, visual aesthetics, and technique.

Prerequisites
AVT 382 or AVT 390, or permission of instructor.

Hours of Lecture or Seminar per week
2
Hours of Lab or Studio per week
4

AVT 390 - Digital Media and Video Art

Credits: 4
Integrates study of contemporary art theory, montage theory, and artistic practices with application to new media and technology. Special focus on video, visual digital, video art, sound design, and the sociopolitical implications of digital work.

Prerequisites
AVT 280 or permission of the instructor.

Hours of Lecture or Seminar per week
2
Hours of Lab or Studio per week
4

AVT 392 - Gallery Practices

Credits: 4
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.

Prerequisites
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
Introductory working and learning experience with an organization or individual in the arts, or as a teaching assistant.

Prerequisites
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
0
Hours of Lab or Studio per week
0

AVT 394 - Honors Seminar

Credits: 1
Offers highly motivated students opportunities to interact with art world professionals through field trips, research, critiques, and creative assignments.

Prerequisites
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
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.

Prerequisites
ENGL 302 or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0
AVT 396 - Introduction to Art Teaching and Learning

Credits: 3
Explores art-teaching profession through readings, discussion, hands-on 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.

Prerequisites
Junior standing, completion of ENGL 302, and completion of at least 20 credits of AVT course work (including AVT 307); or permission of art education advisor.

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 399 - Special Topics in Art and Visual Technology

Credits: 1-6
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
1-6

Hours of Lab or Studio per week
0-6

AVT 414 - Corporate Design and Branding

Credits: 4
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.

Prerequisites
AVT 252 or 253, AVT 311, and AVT 395, or permission of instructor.

Hours of Lecture or Seminar per week
2

Hours of Lab or Studio per week
4

AVT 415 - Web Design and Usability
Credits: 4
Introduces students to web design, usability, and the use of popular applications for static, interactive, and motion-based web development.

**Prerequisites**
AVT 252 or 253, AVT 311, and AVT 395 or permission of instructor.

**Hours of Lecture or Seminar per week**
2

**Hours of Lab or Studio per week**
4

**AVT 419 - Topics in Graphic Design**

Credits: 1-6
Rotating subjects give students a deep look into and appreciation of a specific topic in design practice.

**Prerequisites**
AVT 311 and AVT 313 or 414.

**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 422 - Drawing III**

Credits: 4
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.

**Prerequisites**
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
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.

Prerequisites
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
Intermediate course with an emphasis on developing personal content, concepts, painting strategies, and a practical understanding of contemporary ideas in painting.

Prerequisites
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
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.

Prerequisites
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
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.

Prerequisites
AVT 433 or permission of instructor.
AVT 435 - Painting VI

Credits: 4
Advanced directed research in painting. Employing rigorous concepts, presentation strategies, and in-depth critique, students develop independent projects into a cohesive body of work.

Prerequisites
AVT 434 or permission of instructor.

AVT 442 - Printmaking III

Credits: 4
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.

Prerequisites
AVT 343 or permission of the instructor.

AVT 443 - Printmaking IV

Credits: 4
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.

Prerequisites
AVT 442 or permission of the instructor.
AVT 444 - Printmaking V

Credits: 4
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.

Prerequisites
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
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.

Prerequisites
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 Photographic Printing I

Credits: 4
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 critical discussions.

Prerequisites
AVT 353 or permission of instructor.

Hours of Lecture or Seminar per week
2
Hours of Lab or Studio per week
4
AVT 453 - Advanced Photographic Printing II

Credits: 4
Students produce a photographic portfolio based on technique, content, personal expression, photographic criticism, and knowledge of contemporary trends. Includes critical discussions, and reading and writing assignments.

Prerequisites
AVT 452 or permission of instructor.

Notes
Intensive continuation of AVT 452.

Hours of Lecture or Seminar per week
2
Hours of Lab or Studio per week
4

AVT 454 - Alternative Photo Processes

Credits: 4
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.

Prerequisites
AVT 353 or permission of instructor.

Hours of Lecture or Seminar per week
2
Hours of Lab or Studio per week
4

AVT 455 - Advanced Digital Photo

Credits: 4
Digital Photo with further exploration into digital techniques and personal expression. The semester is spent developing and creating a portfolio of photographic images.

Prerequisites
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
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.

Prerequisites
AVT 353 or permission of instructor.

Hours of Lecture or Seminar per week
2
Hours of Lab or Studio per week
4

AVT 457 - Documentary Photography

Credits: 4
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.

Prerequisites
AVT 452 or permission of instructor.

Hours of Lecture or Seminar per week
2
Hours of Lab or Studio per week
4

AVT 458 - Advanced Studio Lighting

Credits: 4
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.

Prerequisites
AVT 356 or permission of instructor.

Hours of Lecture or Seminar per week
2
Hours of Lab or Studio per week
4

AVT 459 - About Photography: Practice and Research

Credits: 4
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.

**Prerequisites**
One course from AVT 452-458 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 462 - Sculpture III**

Credits: 4
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.

**Prerequisites**
AVT 363 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 463 - Sculpture IV**

Credits: 4
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.

**Prerequisites**
AVT 462 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 464 - Sculpture V**

Credits: 4
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.

**Prerequisites**
AVT 463 or permission of instructor.
AVT 465 - Sculpture VI

Credits: 4
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.

Prerequisites
AVT 464 or permission of instructor.

Notes
Continuation of advanced work in AVT 465.

AVT 472 - Critical Theory in the Visual Arts

Credits: 3
Examination of currents in theory and criticism that inform contemporary practice and critical analysis in the visual arts.

Prerequisites
ARTH 374 or permission of instructor.

AVT 473 - Advanced Performance Studio

Credits: 4

Prerequisites
AVT 373 or permission of instructor.
AVT 482 - Advanced Two-Dimensional Digital Art

Credits: 4
In-depth look at advanced digital imaging techniques and contemporary practices. Students are required to create a portfolio of large format high-resolution digital prints and further develop visual critical analysis skills through active participation in critiques.

Prerequisites
AVT 280 or permission of instructor.

AVT 483 - Internet Art

Credits: 4
Investigates Internet as space for making art while detailing a selection of tools, concepts, issues, and history pertaining to Internet art.

Prerequisites
AVT 382 or AVT 390, or permission of instructor.

AVT 487 - Advanced Digital Media

Credits: 4
Integrates media art techniques, including rotoscoping, stop motion, layer compositing, hand drawing, and experimental animation, with digital video editing and DVD authoring. Special focus on intersection of traditional techniques, installation, and contemporary media art theory.

Prerequisites
AVT 382 or AVT 390, or permission of instructor.
AVT 489 - Internship in Art and Visual Technology

Credits: 1-6
Unpaid professional-level work experience in a professional organization or with an individual artist, related to the student's concentration and career plans.

Prerequisites
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.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
0

AVT 491 - Independent Study in Art and Visual Technology

Credits: 1-6
Opportunity for development of advanced skills and concepts in a field of interest. Study proposal must be approved by instructor prior to registration.

Prerequisites
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.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
0

AVT 493 - Teaching Visual Thinking Through Media, PK-12

Credits: 3
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.

Prerequisites
AVT 396 or permission of art education advisor.

Hours of Lecture or Seminar per week
3
AVT 494 - Teaching Critical Response to Art, PK-12

Credits: 3
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.

Prerequisites
AVT 396 or permission of art education advisor.

AVT 497 - Senior Project

Credits: 4
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.

Prerequisites
Senior art and visual technology major, completion of 12 concentration credits, and completion of or concurrent enrollment in all required general education courses.

AVT 498 - Senior Design Project

Credits: 4
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.

Prerequisites
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.
AVT 522 - Drawing V

Credits: 4
Drawing on an advanced level, emphasizing individual decision-making and personal initiative.

Prerequisites
Admission to AVT graduate program or permission of instructor for AVT 522; or permission of instructor for 523.

Hours of Lecture or Seminar per week
2
Hours of Lab or Studio per week
4

AVT 523 - Drawing VI

Credits: 4
Drawing on an advanced level, emphasizing individual decision-making and personal initiative.

Prerequisites
Admission to AVT graduate program or permission of instructor for AVT 522; AVT 522; or permission of instructor for 523.

Hours of Lecture or Seminar per week
2
Hours of Lab or Studio per week
4

AVT 596 - Independent Study

Credits: 1-6
Independent reading and research on specific project under department faculty member's direction.

Prerequisites
BA or equivalent, 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
Exploration of topical studies in AVT, including theoretical and critical aspects of art or studio production.

**Prerequisites**
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
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.

**Prerequisites**
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 605 - Issues and Research in Art Education

Credits: 3
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.

**Prerequisites**
Admission to the MAT program and permission of instructor.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

### AVT 610 - Graduate Seminar

Credits: 1-4
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.

**Prerequisites**

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 4 credits.

**AVT 611 - Graduate Design Seminar**

Credits: 1

A laboratory for the exploration of contemporary design theory and practice through writing and design making, this class will have rotating topical content.

**Prerequisites**

Admission to graphic design MA (or MFA) program, or permission of instructor.

**Notes**

Can be repeated.

**AVT 612 - Thesis Research**

Credits: 1

Provides the development and research phase in preparation for AVT 794: Thesis, the capstone course in the graphic design masters program. Students will prepare their written thesis proposal for presentation to the AVT GD Graduate Faculty Committee.

**Prerequisites**

Admission to AVT graphic design graduate program and completion of 30 graduate credits.

**Notes**

To be completed prior to enrolling in AVT 794: Thesis

**Hours of Lecture or Seminar per week**

0

**Hours of Lab or Studio per week**

0
AVT 613 - Graphic Design History

Credits: 3
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.

Prerequisites
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
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.

Hours of Lecture or Seminar per week
2

Hours of Lab or Studio per week
4

AVT 615 - Technology for Art Teachers

Credits: 3
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.

Prerequisites
Admission to the MAT program and permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

AVT 616 - Networked Art Practice
Studio, lecture course investigating art as networked activity. Particular attention focused on Internet as context for creation, distribution, and patronage of art.

Prerequisites
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 617 - Advanced Typography

Credits: 4
Students will produce a body of work exploring the opportunities and limitations of typographical design.

Prerequisites
Admission to graphic design MA (or MFA) program, or permission of the instructor

Hours of Lecture or Seminar per week
2
Hours of Lab or Studio per week
4

AVT 619 - Advanced Web Design

Credits: 4
Develops skills for the application of information, interaction, usability, and visual design for web site development. 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.

Hours of Lecture or Seminar per week
2
Hours of Lab or Studio per week
4

AVT 620 - Theory, Criticism, and the Visual Arts

Credits: 3
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.

Prerequisites
Admission to AVT graduate program or permission of instructor.
AVT 622 - Advanced Drawing

Credits: 4
Advanced directed research in drawing with continued development of individual aesthetic. Study of historical and philosophical precedents integral.

Prerequisites
Admission to AVT graduate program or permission of instructor.

AVT 632 - Graduate Painting I

Credits: 5
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.

Prerequisites
Admission to AVT graduate program or permission of instructor.

AVT 633 - Graduate Painting II

Credits: 5
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.

Prerequisites
AVT 632, or permission of instructor.
AVT 634 - Advanced Graduate Painting

Credits: 5
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.

Prerequisites
AVT 633, or permission of instructor.

Hours of Lecture or Seminar per week
2

Hours of Lab or Studio per week
6

AVT 642 - Graduate Printmaking I

Credits: 5
Directed research and practice in printmaking focuses on individualized development of content and technique. Explores intellectual and expressive aspects of printmaking process.

Prerequisites
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 643 - Graduate Printmaking II

Credits: 5
Directed research and practice in printmaking focuses on individualized development of content and technique. Explores intellectual and expressive aspects of printmaking process.

Prerequisites
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 644 - Advanced Graduate Printmaking

Credits: 5
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.

Prerequisites
AVT 643, or permission of instructor.

Hours of Lecture or Seminar per week
2
Hours of Lab or Studio per week
6

AVT 652 - Graduate Photography I

Credits: 5
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.

Prerequisites
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 653 - Graduate Photography II

Credits: 5
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.

Prerequisites
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
2
AVT 654 - Advanced Graduate Photography

Credits: 5
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.

Prerequisites
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.

AVT 662 - Graduate Sculpture I

Credits: 5
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.

Prerequisites
Admission to AVT graduate program or permission of instructor.

AVT 663 - Graduate Sculpture II

Credits: 5
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.

Prerequisites
AVT 662 or permission of instructor.
AVT 664 - Advanced Graduate Sculpture

Credits: 5
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.

Prerequisites
AVT 663 or permission of instructor.

Notes
Writing and reading components.

AVT 667 - Two-Dimensional Art Making: Form, Theme, and Context

Credits: 4
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.

Prerequisites
Admission to the MAT program and permission of the instructor based on a portfolio review.

Hours of Lecture or Seminar per week
2

Hours of Lab or Studio per week
4

AVT 668 - Three-Dimensional Art Making across Cultures

Credits: 4
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.

Prerequisites
Admission to the MAT program and permission of the instructor.

Hours of Lecture or Seminar per week
2
AVT 669 - Four Dimensional Art Making: Technology and New Media

Credits: 4
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: 3 or 6
Supervised classroom teaching practicum in Mason's undergraduate program or community college program.

Prerequisites
Admission to AVT graduate program or permission of instructor.

Notes
May be repeated for total of 6 credits.

Hours of Lecture or Seminar per week
3 or 6

Hours of Lab or Studio per week
0

AVT 672 - Performance Studio I

Credits: 5
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.

Prerequisites
Admission to AVT graduate program or permission of instructor.

Notes
Substantial research project required.

Hours of Lecture or Seminar per week
2

Hours of Lab or Studio per week
6
AVT 673 - Performance Studio II

Credits: 5
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.

Prerequisites
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 674 - Advanced Performance Studio

Credits: 5
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.

Prerequisites
AVT 673 or permission of instructor.

Hours of Lecture or Seminar per week
2
Hours of Lab or Studio per week
6

AVT 675 - Advanced Performance Topics

Credits: 5
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.

Prerequisites
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 - Sound and Music for Video and Animation

Credits: 5
Combined lecture and studio course focusing on selection, editing, processing, and integration of sound and music (postproduction) into video and animation. Studies time, frequency, and amplitude domain and processing. Students postproduce sound and music for 15-minute film or animation due at semester end.

Prerequisites
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 678 - Interface and CD-ROM Design

Credits: 5
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.

Prerequisites
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 682 - The Art of 2D Animation

Credits: 5
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.

Prerequisites
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 684 - Two-Dimensional Digital Art

Credits: 5
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.

Prerequisites
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 685 - Video Art

Credits: 5
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.

Prerequisites
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 686 - Three-Dimensional Digital Art

Credits: 5
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.

Prerequisites
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 687 - Advanced Digital Media

Credits: 5
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.

Prerequisites
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 - Digital Animation

Credits: 5
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.

Prerequisites
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 691 - Elementary Art Education

Credits: 3
Concepts and methods in early childhood and elementary art education.

Prerequisites
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
Concepts and methods in secondary art education.

Prerequisites
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 or 6
Apprenticeship at a local business conforming to students' interests in visual information technologies.

Prerequisites
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
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.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

AVT 695 - Internship in Art Education (Student Teaching)
Credits: 6
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.

Prerequisites
Completion of all other MAT program requirements.

Corequisite
AVT 696.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
0

AVT 696 - Seminar for Student Teachers

Credits: 1
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
AVT 695.

Hours of Lecture or Seminar per week
2
Hours of Lab or Studio per week
0

AVT 697 - Advanced Strategies and Curricular Innovations in the Visual Arts

Credits: 2
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.

Prerequisites
Completion of all ASTL art education concentration courses.

Hours of Lecture or Seminar per week
2
Hours of Lab or Studio per week
0

AVT 794 - Independent Design Project

Credits: 4
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.

**AVT 796 - Directed Project, Directed Reading, Thesis**

Credits: 1-9
Involves a study of historical basis for studio project, independent creative production suitable for public viewing, and written thesis documenting evolution of the creative problem and exploring the intention, purpose, and relative success of the finished production.

**Prerequisites**
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, Directed Reading, Thesis**

Credits: 3
Involves a study of historical basis for studio project, independent creative production suitable for public viewing, and written thesis documenting evolution of the creative problem and exploring the intention, purpose, and relative success of the finished production.

**Prerequisites**
Admission to AVT graduate program or permission of instructor.

**Notes**
One of three courses comprising the MFA comprehensive experience for AVT students.

**AVT 799 - Directed Project, Directed Reading, Thesis**

Credits: 1-3
Involves a study of historical basis for studio project, independent creative production suitable for public viewing, and written
thesis documenting evolution of the creative problem and exploring the intention, purpose, and relative success of the finished production.

**Prerequisites**
Admission to AVT graduate program or permission of instructor.

**Notes**
One of three courses comprising the MFA comprehensive experience for AVT students.

**BENG 401 - Bioengineering Instrumentation and Design**

Credits: 4
Exposes students to the engineering design process with special focus in medical and biological applications. Tools to be explored range from specialized software (LabView, OrCad, Matlab) to laboratory and machine shop facilities. The semester culminates in the presentation of a group project. Students are expected to leverage their background and apply it to a problem in bioengineering.

**Prerequisites**
BIOL 213; ECE 320 and 333, or permission of instructor.

**Hours of Lecture or Seminar per week**
0

**Hours of Lab or Studio per week**
0

**BENG 402 - Bioengineering Instrumentation and Design Laboratory**

Credits: 1
Introduces a project-based laboratory where students are exposed to all available tools from several electrical and computer engineering disciplines. Students will physically implement their own team-based project using a subset of those tools.

**Prerequisites**
BIOL 213, ECE 320 and 333, or permission of instructor.

**Corequisite**
BENG 401

**Notes**
Projects are demonstrated during oral presentations toward the end of the semester.

**Hours of Lecture or Seminar per week**
0

**Hours of Lab or Studio per week**
3
BENG 492 - Senior Advanced Design Project I

Credits: 2
Conception of senior design project in bioengineering and determination of feasibility of proposed project. Work includes developing preliminary design and implementation plan.

Prerequisites
90 credit hours applicable to the BSEE degree and COMM 100 and ENGL 302.

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
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. Completing this course with a C or better satisfies university's general education synthesis requirement.

Prerequisites
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 499 - Special Topics in Bioengineering

Credits: 0-4
Topics of special interest to undergraduates.

Prerequisites
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
0

Hours of Lab or Studio per week
0
BINF 354 - Foundations in Mathematical Biology

Credits: 3
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.

Prerequisites
Completion or concurrent enrollment in all other required general education courses; chemistry and integral calculus; or permission of instructor.

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
Topics are presented as three-week units: protein sequence, structure prediction, and modeling methods; nucleic acid sequence and structure prediction, and evolutionary models; gene structure prediction in prokaryotes and eukaryotes; image analysis, and biomedical applications.

Prerequisites
BIOL 213, IT 108, IT 208, or CS 112 (instead of IT 108 and IT 208), STAT 344, or STAT 250.

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
Topics are presented as three-week units: the design and use of parallel genomics platforms, mapping the measurements to biomolecules; approaches for inferring biological pathways; simulation methods for the dynamics of biomolecules; systems approaches to biology.

Prerequisites
BINF 401 and BINF 403.

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  
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**
BINF 401.

0  
Hours of Lecture or Seminar per week
3

**BINF 404 - Bioinformatics and Computational Biology Lab II**

Credits: 1  
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.

**Prerequisites**
Concurrent enrollment in BINF 402 and passing grades in BINF 401 and 403.

0  
Hours of Lecture or Seminar per week
3

**BINF 450 - Bioinformatics for Life Sciences**

Credits: 4  
The use of bioinformatics has become pervasive throughout the life sciences. This course will teach students how to understand the basis of and use of bioinformatics software in database searching, sequence analysis, gene identification, genomics, protein structure and phylogeny.

**Prerequisites**
BIOL 213 and either BIOL 482 or BIOL 483/CHEM 463.

3  
Hours of Lecture or Seminar per week
**BINF 470 - Molecular Biophysics**

Credits: 3  
**Cross-Listed with** PHYS 370

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.

**Prerequisites**  
PHYS 307 or CHEM 331 and CHEM 332 or permission of instructor.

**Hours of Lecture or Seminar per week**  
3

**BINF 491 - Senior Thesis in Bioinformatics**

Credits: 1  
A project is chosen and completed under the guidance of a Bioinformatics Department faculty member.

**Prerequisites**  
The bioinformatics minor core classes.

**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  
A project is chosen and completed under the guidance of a Bioinformatics Department faculty member.

**Prerequisites**  
BINF 491.

**Notes**  
A written thesis in standard format is required.

**Hours of Lecture or Seminar per week**
BINF 630 - Bioinformatics Methods

Credits: 3
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.

Prerequisites
Graduate standing, or permission of instructor.

BINF 631 - Molecular Cell Biology for Bioinformatics

Credits: 3
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.

Prerequisites
Undergraduate background in biochemistry or cell biology, or permission of instructor.

BINF 633 - Molecular Biotechnology

Credits: 3
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.

Prerequisites
Graduate standing or permission of instructor.
Hours of Lab or Studio per week
0

BINF 634 - Bioinformatics Programming

Credits: 3
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.

Prerequisites
Graduate standing and computer programming experience, or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

BINF 636 - Microarray Methodology and Analysis

Credits: 3
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.

Prerequisites
BINF 633, or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

BINF 637 - Forensic DNA Sciences

Credits: 3
Intensive introduction to parameters affecting data QC and analysis, including factors arising from biochemistry, chemistry, genetics, statistics, instrumentation, and software.

Prerequisites
Graduate standing or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0
BINF 639 - Introduction to Biometrics

Credits: 3
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.

Prerequisites
Programming experience such as CSI 603 and 604, or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

BINF 650 - Introduction to Bioinformatics Database Design

Credits: 3
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.

Prerequisites
BINF 634 or equivalent, or permission of the instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

BINF 690 - Numerical Methods for Bioinformatics

Credits: 3
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.

Prerequisites
Calculus and knowledge of a programming language, such as CS 112 and MATH 113, or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

BINF 701 - Biochemical Systematics (Biochemistry) Core for Doctoral Studies in Biosciences and Bioinformatics
Credits: 3  
**Cross-Listed with BIOS 701**

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.

**Prerequisites**  
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  
**Cross-Listed with BIOS 702**

Trains students in research methodologies for life sciences. Covers the three phases of biological research projects: experimental design, data collection, and data analysis.

**Prerequisites**  
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

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**BINF 703 - Bioinformatics Lab Rotation**

Credits: 1  
Short-term introductory research on a specific topic in computational sciences and informatics under direction of faculty member.

**Prerequisites**  
Permission of instructor.

**Notes**  
May be repeated.

**Hours of Lecture or Seminar per week**  
0

**Hours of Lab or Studio per week**  
1
BINF 704 - Colloquium in Bioinformatics

Credits: 1
Seminar presentations in a variety of areas of bioinformatics and computational biology by COS faculty, staff, advanced PhD students, and professional visitors.

Prerequisites
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
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.

Prerequisites
Permission of instructor.

Hours of Lecture or Seminar per week
1

Hours of Lab or Studio per week
0

BINF 730 - Biological Sequence Analysis

Credits: 3
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.

Prerequisites
BINF 702 or previous courses in programming, molecular biology, and probability, 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
Computational methods for analyzing, classifying, and predicting three-dimensional protein structures. Covers theoretical approaches, techniques, and computational tools for protein structure analysis.

Prerequisites
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
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.

Prerequisites
BINF 730 or previous courses in biology, numerical methods, and programming; 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
Analyzes gene expression data. Topics include cluster analysis and visualization of expression data, inference of genetic regulatory networks, and theoretical models of genetic networks.

Prerequisites
Programming experience and course in molecular biology, or permission of instructor; S-Plus or Matlab experience may be helpful.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

BINF 734 - Advanced Bioinformatics Programming
Credits: 3
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.

Prerequisites
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
Selected topics in bioinformatics not covered in fixed-content bioinformatics courses.

Prerequisites
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
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.

Prerequisites
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
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.

**Prerequisites**
BINF 690 and 701, and knowledge of computer programming language; or permission of instructor.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**BINF 751 - Biochemical and Cellular Systems Modeling**

Credits: 3
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.

**Prerequisites**
Calculus and knowledge of a computer programming language; and BINF 690 and 701; or permission of instructor.

**Notes**
Course in differential equations is recommended.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**BINF 760 - Machine Learning for Bioinformatics**

Credits: 3
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.

**Prerequisites**
Familiarity with bioinformatics methods and databases (e.g., BINF 630), molecular cell biology (e.g., BINF 631), bioinformatics programming (e.g., BINF 634), or permission of the instructor.

**Notes**
In addition to lectures from the instructor, students will present papers from the literature and complete a machine learning project.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0
BINF 796 - Directed Reading and Research

Credits: 3
Reading and research on specific topic in computational sciences and informatics under direction of faculty member.

Notes
May be repeated.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

BINF 798 - Research Project

Credits: 3
Project chosen and completed under guidance of graduate faculty member that results in acceptable technical report.

Prerequisites
12 graduate credits and permission of instructor.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
0

BINF 799 - Master's Thesis

Credits: 1-6
Project chosen and completed under guidance of graduate faculty member that results in acceptable technical report (master's thesis) and oral defense.

Prerequisites
12 graduate credits and permission of instructor.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
0
Grading
S/IP

BINF 820 - Advanced Topics in Molecular Cell Biology
Credits: 3
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.

Prerequisites
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
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.

Prerequisites
BINF 731, or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

BINF 841 - Research Topics in Biomolecular Simulations

Credits: 3
Research-oriented course combining lectures and work on individual projects in biomolecular simulations. Topics include protein and peptide aggregation, binding, and unfolding and folding.

Prerequisites
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: 1-12
Reading and research on specific topic in computational sciences and informatics under direction of faculty member.

Prerequisites
Admission to doctoral program and permission of instructor.

Notes
May be repeated.

Hours of Lecture or Seminar per week
0

Hours of Lab or Studio per week
0

BINF 998 - Doctoral Dissertation Proposal

Credits: 1-12
Covers development of research proposal, which forms basis for doctoral dissertation, under guidance of dissertation director and doctoral committee.

Prerequisites
Permission of advisor.

Notes
May be repeated.

Hours of Lecture or Seminar per week
0

Hours of Lab or Studio per week
0

Grading
S/IP

BINF 999 - Doctoral Dissertation

Credits: 1-12
Doctoral dissertation research under direction of dissertation director.

Prerequisites
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

BIOD 604 - Introduction to Biodefense I: Bacterial and Toxin Agents

Credits: 3
Covers pathology, metabolism, and threat of bacterial 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 605 - Introduction to Biodefense II: Viral Agents

Credits: 3
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
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: 1-4
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.

Prerequisites
BIOD 604 and 605 or permission of instructor.
BIOD 610 - Advanced Topics in Biodefense

Credits: 1-4
Different topics, depending on instructor's specialty. Topics include legal, ethical, scientific, and political aspects of biodefense, emphasizing current problems and research.

Prerequisites
BIOD 604 and 605 or permission of instructor.

Notes
May be repeated when topic is different.

BIOD 620 - Health and Security

Credits: 3
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.

Prerequisites
BIOD 604 and 605 or permission of instructor

BIOD 621 - Ethics and International Security

Credits: 3
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.
BIOD 622 - Negotiating in the International Arena

Credits: 3
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.

BIOD 702 - Biodefense Colloquium

Credits: 1
Forum for presentation and discussion of original and current research in biodefense.

Notes
May be repeated for credit.

BIOD 705 - Intelligence: Theory and Practice

Credits: 3
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.

Prerequisites
BIOD 604 and 605, or permission of instructor.
BIOD 706 - Nuclear, Biological, and Chemical Weapons Policy and Security

Credits: 3
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.

Prerequisites
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
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.

Prerequisites
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
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.

Prerequisites
BIOD 604 and 605.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0
BIOD 722 - Examining Terrorist Groups

Credits: 3
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.

Prerequisites
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
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.

Prerequisites
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
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.

Prerequisites
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
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.

Prerequisites
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
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.

Prerequisites
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
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.

Prerequisites
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
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.

Prerequisites
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 761 - Dispersal Patterns of Biological Agents

Credits: 3
Introduction to military and terrorist methods of dispersal patterns. Covers physics of aerosols; engineering and mechanics of building ventilation systems; and mechanical dissemination, including hand-held, automatic, vehicle, and truck-mounted systems. Includes viability of specific agents involved.

Prerequisites
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
Introductory course covers methodology of working in a Biosafety Level 3 or 4 environment. Special attention to responding to biowarfare or bioterrorism related event.

Prerequisites
BIOD 604 and 605, or permission of instructor

Hours of Lecture or Seminar per week
2

Hours of Lab or Studio per week
0

BIOD 766 - Development of Vaccines and Therapeutics

Credits: 3
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.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**BIOD 780 - Master's Supervised Internship**

Credits: 1-6
Internship under supervision of qualified professional in biodefense at a government agency, consulting firm, industrial firm, or other acceptable agency.

**Prerequisites**
Permission of program director or advisor.

**Hours of Lecture or Seminar per week**
0

**Hours of Lab or Studio per week**
0

**BIOD 793 - Directed Studies in Biodefense**

Credits: 1-3
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.

**Prerequisites**
Permission of the instructor and program director.

**Hours of Lecture or Seminar per week**
0

**Hours of Lab or Studio per week**
0

**BIOD 798 - Master's Research Project in Biodefense**

Credits: 3
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.

**Prerequisites**
24 credits in BIOD and permission of project director.

**Hours of Lecture or Seminar per week**
0

**Hours of Lab or Studio per week**
0
BIOD 799 - Master's Thesis in Biodefense

Credits: 1-6
Master's thesis research under direction of thesis committee.

Prerequisites
24 credits in BIOD and permission of thesis committee.

Hours of Lecture or Seminar per week
0

Hours of Lab or Studio per week
0

Grading
S/NC

BIOD 810 - Advanced Seminar in Biodefense

Credits: 3
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.

Prerequisites
BIOD 604 and 605, or permission of advisor.

Notes
May be repeated for credit twice 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
Internship under supervision of qualified biodefense professional at government agency, consulting firm, industrial firm, or other acceptable agency.

Prerequisites
Permission of program director or advisor.

Hours of Lecture or Seminar per week
0
BIOD 899 - Directed Research in Biodefense

Credits: 1-12
Research on a pertinent topic in biodefense; scope and subject determined by instructor.

Prerequisites
Approval of program director.

BIOD 996 - Doctoral Reading and Research

Credits: 1-9
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.

BIOD 998 - Doctoral Dissertation Proposal

Credits: 1-12
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.
BIOD 999 - Doctoral Dissertation

Credits: 1-12
Doctoral dissertation research under direction of dissertation chair.

Prerequisites
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

BIOL 103 - Introductory Biology I

Credits: 4
Topics include chemistry of life, cell structure and function, Mendelian genetics, evolution, and diversity of life.

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
F, S, SUM

BIOL 104 - Introductory Biology II

Credits: 4
Topics include animal (including human) structure, function, homeostatic mechanisms, organ systems, behavior, higher plant systems, and major concepts in ecology.

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
F, S, SUM
BIOL 105 - Introductory Biology I Laboratory

Credits: 1
The chemical basis of life, the structure and function of the cell, Mendelian and human genetics, and the major animal phyla are presented.

Prerequisites
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
0
Hours of Lab or Studio per week
3

BIOL 106 - Introductory Biology II Laboratory

Credits: 1
The structure and function of major organ systems of animals and an examination of the structure and function of plants, emphasizing the higher plants.

Prerequisites
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
0
Hours of Lab or Studio per week
3

BIOL 124 - Human Anatomy and Physiology

Credits: 4
Introduction to structure and function of body's major organ systems.

Notes
Should be taken in sequence. Does not satisfy natural science requirement for BA in CAS.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
3
BIOL 125 - Human Anatomy and Physiology

Credits: 4
Introduction to structure and function of body's major organ systems.

Notes
Should be taken in sequence. Does not satisfy natural science requirement for BA in CAS.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
3
When Offered
F, S, SUM

BIOL 213 - Cell Structure and Function

Credits: 4
For science majors and preprofessionals in life sciences. Introduction to cell chemistry, metabolism, and genetics.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
3
When Offered
F, S, SUM

BIOL 225 - Human Reproduction and Sexuality

Credits: 3
Examines anatomy and physiology of human reproductive systems, physiology of sexual intercourse, normal pregnancy, birth, congenital conditions, sex determination and its expression, diseases of reproductive organs, and technical developments related to reproduction.

Notes
Not available for biology major or minor credit.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0
When Offered
F
BIOL 246 - Introductory Microbiology

Credits: 3
Introduction to microbial cell structure, physiology, and pathogenicity. Emphasizes control of microorganisms, host-parasite interactions including immunology, and viral and bacterial pathogens.

Prerequisites
C or better in BIOL 124 and 125, one year of general biology, or permission of instructor.

Corequisite
BIOL 306.

Notes
Not available for biology major credit. Not available to students who have taken BIOL 213 or 418.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

When Offered
F, S

BIOL 301 - Biology and Society

Credits: 3
Cross-Listed with EVPP 421

Biological problems facing society including pollution, cloning, emerging diseases, global warming, and overpopulation.

Prerequisites
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
Emphasizes structure and function of vertebrates, but surveys all animal groups and protozoa. Also covers evolutionary theory, and evolutionary history of major animal groups.
Prerequisites
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
F, S, SUM

BIOL 304 - Plant Biology

Credits: 4
Introduction to study of plants, their structure, development, nutrition, and ecology. Emphasizes flowering plants, but surveys all groups and their phylogenetic relationships.

Prerequisites
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
F, S, SUM

BIOL 305 - Biology of Microorganisms

Credits: 3
Morphology, physiology, and pathogenicity of certain groups of bacteria, fungi, and viruses; stresses host-parasite interactions.

Prerequisites
C or better in BIOL 213, or permission of instructor.

Corequisite
BIOL 306.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0
When Offered
F, S, SUM

BIOL 306 - Biology of Microorganisms Laboratory
Credits: 1
Laboratory techniques in culturing, staining, and identifying microorganisms.

Corequisite
BIOL 246 or 305.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
3
When Offered
F, S, SUM

BIOL 307 - Ecology

Credits: 4
Physical environment, energy flow, structure and function of populations, dynamics of communities, and succession.

Prerequisites
BIOL 303 and 304, or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
3
When Offered
F, S, SUM

BIOL 309 - Introduction to Oceanography

Credits: 3
Cross-Listed with GEOL 309

Introduction to chemical, biological, and geological aspects of oceanic environment.

Prerequisites
GEOL 101 and BIOL 103, or 213 or EVPP 110, 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
F
BIOL 311 - General Genetics

Credits: 4
Basic principles of heredity and modern developments in this field.

Prerequisites
BIOL 213, 303, 304, 305, 306 all completed with no more than one D; or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
3
When Offered
F, S, SUM

BIOL 312 - Biostatistics

Credits: 4
Use of probability and descriptive and inferential statistical techniques in interpreting biological data.

Prerequisites
BIOL 303 and 304, or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
2
When Offered
F

BIOL 313 - Human Genetics for the Social Sciences

Credits: 3
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.

Prerequisites
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
S, odd
BIOL 318 - Conservation Biology

Credits: 3
Introduction to science used to identify species in need of conservation, and techniques to manage and protect organisms.

Prerequisites
BIOL 307 and 311, 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
Compares anatomy and morphology of major chordate groups. Lab emphasizes shark, mudpuppy, cat, and rabbit.

Prerequisites
BIOL 303, or permission of instructor.

Hours of Lecture or Seminar per week
2
Hours of Lab or Studio per week
6
When Offered
AF

BIOL 322 - Developmental Biology

Credits: 4
Principles of embryonic development and differentiation in animal species at cellular, molecular, tissue, and whole organism levels.

Prerequisites
BIOL 303 and 311, or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
3
When Offered
F
BIOL 326 - Animal Physiology

Credits: 3
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.

Prerequisites
BIOL 213, 303, and 60 credits.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

BIOL 327 - Animal Physiology Laboratory

Credits: 2
Investigation of invertebrate and vertebrate physiology. Emphasizes responses to environmental changes.

Prerequisites/Corequisites
BIOL 326 and permission of instructor.

Hours of Lecture or Seminar per week
1
Hours of Lab or Studio per week
3

BIOL 331 - Invertebrate Zoology

Credits: 4
Survey of invertebrate phyla, excluding insects, showing morphology, phylogeny, and general biology of these groups.

Prerequisites
BIOL 303, 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
Survey of insects including taxonomy, morphology, physiology, behavior, ecology, and economic importance.
Prerequisites
BIOL 303, or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
3

BIOL 333 - Vertebrate Zoology

Credits: 4
Introduces vertebrates with emphasis on systematics, life history, behavior, and ecology. Laboratory emphasis on identification and natural history of local fauna.

Prerequisites
BIOL 307 or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
3

BIOL 342 - Plant Morphology

Credits: 4
Origin and development of organs, tissue systems, and life cycles of green plants, with phylogenetic comparisons from algae to angiosperms.

Prerequisites
BIOL 304, or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
3

BIOL 344 - Taxonomy of Flowering Plants

Credits: 4
Study of terminology and identification of flowering plants with emphasis on local flora.

Prerequisites
BIOL 304, or permission of instructor.

Hours of Lecture or Seminar per week
3
**BIOL 345 - Plant Communities**

Credits: 4  
Plant associations and formations and their successions in North America.

**Prerequisites**  
BIOL 304, or permission of instructor.

**Notes**  
Three Saturday or Sunday field trips required.

**BIOL 350 - Freshwater Ecosystems**

Credits: 4  
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.

**Prerequisites**  
CHEM 211/212, and either EVPP 110/111 or BIOL 307.

**BIOL 355 - Ecological Engineering and Ecosystem Restoration**

Credits: 4  
Cross-Listed with EVPP 355

This undergraduate course will provide definition, classification and practice of ecological engineering and ecosystem restoration. The course describes general system ecology, ecosystem restoration, and the utilization of natural processes to provide ecosystem services to society and benefits to nature. The content of the course is broad and transdisciplinary, drawing extensively from the natural sciences, the social sciences and the humanities. The objective of this course is to provide students with a systems-oriented perspective on environmental studies. Specifically, the course 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).
Prerequisites
CHEM 211, BIOL 307 and PHYS 243.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
3

BIOL 374 - Biogeography: Space, Time, and Life

Credits: 3
Cross-Listed with EOS 321

A survey of the relationship between the distribution of plants and animals on the earth surface and the physical geography and environmental characteristics.

Prerequisites
BIOL 303 and 304 or EOS 122 or GEOG 102 or permission of instructor

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

BIOL 377 - Applied Ecology

Credits: 3
Introduction to ecosystem concepts and their applications to natural and managed ecosystems.

Prerequisites
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 385 - Biotechnology and Genetic Engineering

Credits: 3
Emphasizes theory and applications, including significance and societal implications of biotechnology applied to medicine, agriculture, and environment.

Prerequisites
BIOL 311; CHEM 211, 212; MATH 110 or 113.

Hours of Lecture or Seminar per week
BIOL 402 - Applied and Industrial Microbiology

Credits: 3
Biology of microorganisms of ecological and industrial significance. Includes food production, spoilage and preservation, fermentation technology, waste disposal, water purification, biodeterioration, and decomposition.

Prerequisites
BIOL 213, 305, 306; CHEM 211, 212; or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

BIOL 403 - Techniques in Applied and Industrial Microbiology

Credits: 1
Lab exercises illustrate basic and applied methodologies, including isolation of commercially useful strains. Discusses production and purification of industrial products.

Prerequisites
BIOL 213, 305, 306; CHEM 211, 212.

Corequisite
BIOL 402, or permission of instructor.

Hours of Lecture or Seminar per week
0

Hours of Lab or Studio per week
3

BIOL 404 - Medical Microbiology

Credits: 3
Basic principles of infectious diseases caused by bacteria and viruses. Discusses genetics and molecular mechanisms of pathogenicity.

Prerequisites
BIOL 305 and 306.

Hours of Lecture or Seminar per week
3
BIOL 405 - Microbial Genetics

Credits: 4
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.

Prerequisites
BIOL 305 and 306.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
3

BIOL 406 - Microbial Physiology and Metabolism

Credits: 4
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.

Prerequisites
BIOL 305 and 306.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
3

BIOL 407 - Microbial Diversity

Credits: 4
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.

Prerequisites
BIOL 305 and 306.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
3
BIOL 411 - Advanced General Genetics

Credits: 3
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.

Prerequisites
2.00 or better in BIOL 311, or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

BIOL 417 - Selected Topics in Molecular and Cellular Biology

Credits: 1-4
Study of current topics in molecular and cellular biology. Lecture, laboratory.

Prerequisites
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
Study of current topics in microbiology.

Prerequisites
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

Prerequisites
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
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.

Prerequisites
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

Credits: 3
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."

Prerequisites
BIOL 311.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

BIOL 425 - Human Physiology
Credits: 3
Organ system approach to study of homeostasis, including cardiovascular, respiratory, renal, digestive, endocrine, and nervous system functions.

Prerequisites
BIOL 213, 303, or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

BIOL 433 - Selected Topics in Plant Biology

Credits: 1-4
Lecture or field course in botany. Topic varies with instructor's specialty.

Prerequisites
BIOL 304, 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
Topics vary with instructor's specialty. May be repeated only with permission of department chair.

Prerequisites
Permission of instructor.

Hours of Lecture or Seminar per week
1-3
Hours of Lab or Studio per week
0-6

BIOL 440 - Field Biology

Credits: 1-4
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.

Prerequisites
BIOL 303, 304, and 60 credits, or permission of instructor.
Notes
Students bear cost of required field trips. May be repeated once with permission of department chair. Total limit for 440, 495, and 497 is 6 credits toward 44 credits required for BS, and only 4 credits toward 32 credits for BA, not to exceed 4 credits in any one semester.

Hours of Lecture or Seminar per week
0-2
Hours of Lab or Studio per week
3-9

BIOL 446 - Environmental Physiology
Credits: 3
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.

Prerequisites
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
Plants and animals of marine environments and physical and chemical conditions that affect their existence.

Prerequisites
BIOL 307 and BIOL/GEOL 309, or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

BIOL 452 - Immunology
Credits: 3
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.

Prerequisites
BIOL 213, 305, 306, and 311; or permission of instructor.

Hours of Lecture or Seminar per week
**BIOL 453 - Immunology Laboratory**

Credits: 1  
Techniques relevant to BIOL 452, including enzyme-linked immunoabsorbant assay, immunodiffusion, protein electrophoresis, and immune fixation.

**Prerequisites/Corequisites**  
BIOL 452

**Hours of Lecture or Seminar per week**  
0

**Hours of Lab or Studio per week**  
3

**BIOL 459 - Fungi and Ecosystems**

Credits: 3  
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.

**Prerequisites**  
BIOL 304, course in microbiology, or permission of instructor.

**Hours of Lecture or Seminar per week**  
3

**Hours of Lab or Studio per week**  
0

**BIOL 465 - Histology**

Credits: 4  
Microscopic structure of animal tissues and organs, with emphasis on vertebrates.

**Prerequisites**  
BIOL 303 and 60 credits, or permission of instructor.

**Hours of Lecture or Seminar per week**  
3

**Hours of Lab or Studio per week**  
3
BIOL 470 - Dinosaur Biology

Credits: 3
An introduction to the evolution, diversity, and biology of the dinosaurs and their descendents. How current biological knowledge is used to estimate and inter the morphology, physiology and ecology of these extinct animals will be emphasized.

Prerequisites/Corequisites
Completion of 60 hours and BIOL 307 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
Process of evolution emphasizing role of genetics, properties of populations, and population differentiations.

Prerequisites
BIOL 311, or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0
When Offered
S

BIOL 472 - Introductory Animal Behavior

Credits: 3
Study of mechanisms, functions, and evolution of behavior.

Prerequisites
BIOL 213, 303, or permission of instructor and 60 credits.

Corequisite
BIOL 473.

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
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.

Corequisite
BIOL 472.

Hours of Lecture or Seminar per week
0

Hours of Lab or Studio per week
3

BIOL 482 - Introduction to Molecular Genetics

Credits: 3
Basic concepts of structure and function of genetic material at molecular level.

Prerequisites
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

Prerequisites
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
Structure and function of cell membranes and organelles with regard to cellular transport, sorting, compartmentalization, signaling, motility, and cell division.
Prerequisites
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
Laboratory experiments using cell biology techniques, including microscopy, spectrophotometry, centrifugation, chromatography, and electrophoresis.

Corequisite
BIOL 484 or permission of instructor.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
3

BIOL 486 - Molecular Biology and Biotechnology Laboratory

Credits: 2
Introduction to theory, techniques, and practices used in modern molecular biotechnology laboratories.

Prerequisites
BIOL 385 or 482.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
6

BIOL 492 - Senior Seminar

Credits: 1
Weekly seminar course dealing with recent advances in biology. Topics selected from recent publications in the field. May be repeated for credit.

Prerequisites
90 credits or permission of instructor.

Hours of Lecture or Seminar per week
1
Hours of Lab or Studio per week
BIOL 493 - Honors Research in Biology

Credits: 1  
Laboratory or field investigation under supervisor's guidance.

Prerequisites  
Admission to the Biology Honors Program.

Hours of Lecture or Seminar per week  
0

Hours of Lab or Studio per week  
0

BIOL 494 - Honors Seminar in Biology

Credits: 1  
Weekly seminar course dealing with recent advances in biology.

Prerequisites  
Admission to department 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  
F, S

BIOL 495 - Directed Studies in Biology

Credits: 1-2  
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.

Prerequisites  
Permission of instructor and department chair.

Notes  
May be taken for 1 to 2 credits and repeated once for a total of 2 credits. Total limit for 440, 495, and 497 is 6 credits toward 44 credits required for BS, and only 4 credits toward 32 credits for BA, not to exceed 4 credits in any one semester.
**BIOL 497 - Special Problems in Biology**

Credits: 1-4  
Lab or field project leading to written report of research. Research and paper completed under instructor's guidance.

**Prerequisites**  
60 credits, and permission of instructor and department chair.

**Notes**  
Total limit for 440, 495, and 497 is 6 credits toward 44 credits required for BS, and only 4 credits toward 32 credits for BA, not to exceed 4 credits in any one semester.

**BIOL 501 - Microbial Diversity: An Organismal Approach**

Credits: 3  
In-depth study of nonpathogenic microbial world, emphasizing detection, enumeration, and classification of microorganisms; their physiological and evolutionary relationships; and biotechnological applications.

**Prerequisites**  
Undergraduate course in microbiology, or permission of instructor.

**BIOL 506 - Selected Topics in Microbiology**

Credits: 1-4  
Topic depends on instructor's specialty.

**Prerequisites**  
BIOL 305, 306, or permission of instructor.

**Notes**  
May be repeated only with permission of department chair.
BIOL 507 - Selected Topics in Ecology

Credits: 1-4
Topic depends on instructor's specialty.

Prerequisites
Course in ecology and permission of instructor.

Notes
May be repeated only with permission of department chair.

BIOL 508 - Selected Topics in Animal Biology

Credits: 1-4
Topic depends on instructor's specialty.

Prerequisites
BIOL 303, or permission of instructor.

Notes
May be repeated only with permission of department chair.

BIOL 515 - Introduction to Neurobiology

Credits: 2
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.

Prerequisites
Completion of 60 credits, including PSYC 372; or BIOL 213 and 303.
BIOL 516 - Mammalian Neurobiology

Credits: 3
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.

Prerequisites
BIOL 515.

BIOL 518 - Conservation Biology

Credits: 3
Introduction to science used to identify species in need of conservation, and techniques to manage and protect organisms.

Prerequisites
BIOL 307, 311, or equivalent.

BIOL 520 - Systematics in Complex Angiosperm Families

Credits: 3
Morphology and speciation of more complex families such as Poaceae, Cyperaceae, and Asteraceae. Laboratory emphasizes identification of specimens, and acquaintance with taxonomic literature.

Prerequisites
BIOL 344 or 534, or permission of instructor.
BIOL 532 - Animal Behavior

Credits: 3
Ecological aspects of animal behavior.

Prerequisites
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
Topic depends on instructor's specialty.

Prerequisites
BIOL 304, 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 534 - Advanced Plant Taxonomy

Credits: 3
Laboratories consist of field trips, and collection and identification of specimens.

Prerequisites
Course in plant taxonomy, or permission of instructor.

Hours of Lecture or Seminar per week
1

Hours of Lab or Studio per week
6

BIOL 535 - Ancient Plants and their Environment

Credits: 3
Study of factors involved in origin, history, and extinction of fossil plants, including adaptations, paleoecology, and major
geological events.

**Prerequisites**
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

**Cross-Listed with** EVPP 536

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.

**Prerequisites**
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

Study of evolution, systematics, physiology, ecology, and behavior of birds, emphasizing field work.

**Prerequisites**
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**
AS

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**BIOL 538 - Mammology**

Credits: 4

Study of evolution, systematics, physiology, ecology, and behavior of mammals, emphasizing field work.

**Prerequisites**
BIOL 539 - Herpetology

Credits: 4
Study of evolution, systematics, physiology, ecology, and behavior of amphibians and reptiles, emphasizing field work.

Prerequisites
Course in ecology, or permission of instructor.

BIOL 543 - Tropical Ecosystems

Credits: 4
Terrestrial, aquatic, and marine ecosystems in tropics, emphasizing plant communities, plant-animal interactions, and role of humans in the tropics.

Prerequisites
Course in ecology, or permission of instructor.

Notes
Field trip to tropics required as part of laboratory.

BIOL 547 - Terrestrial Plant Ecology

Credits: 4
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.

Prerequisites
Course in ecology.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
3

**BIOL 553 - Advanced Topics in Immunology**

Credits: 3
Comprehensive study of immunologic mechanisms as they pertain to immunologic diseases and transplantation.

**Prerequisites**
BIOL 452, or permission of instructor.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**BIOL 556 - Advanced Topics in Microbial Physiology and Metabolism**

Credits: 3
Comprehensive study of microorganisms including growth, nutrition, transport, autotrophic and heterotrophic metabolism, regulation, and differentiation.

**Prerequisites**
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
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.

**Prerequisites**
BIOL 304 or a course in microbiology, or permission of instructor.

**Hours of Lecture or Seminar per week**
3
BIOL 561 - Comparative Animal Physiology

Credits: 3
Detailed study of selected physiological systems of invertebrates and vertebrates, emphasizing current research.

Prerequisites
BIOL 326, or permission of instructor.

Hours of Lecture or Seminar per week
3

BIOL 563 - Virology

Credits: 3
Fundamental concepts of nature of viruses, virus classification, cultivation, and biochemistry. Emphasizes bacteriophage and animal viruses.

Prerequisites
BIOL 482, or permission of instructor.

Hours of Lecture or Seminar per week
3

BIOL 564 - Techniques in Virology

Credits: 1
Basic techniques of animal virus propagation, isolation, and quantitation.

Prerequisites
BIOL 563, virology, and entrance into the PhD/biosciences or MS/biology program; or permission of instructor.

Hours of Lecture or Seminar per week
0

Hours of Lab or Studio per week
3
BIOL 566 - Cancer Genomics

Credits: 3
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.

Prerequisites
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
Comprehensive study of regulatory mechanisms controlling gene expression in viruses, prokaryotes, and eukaryotes, emphasizing current research.

Prerequisites
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
Inheritance of humans emphasizing current problems, including genetic control of metabolic diseases, effects of radiation and chemical agents in environment, and directed genetic change.

Prerequisites
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
Genetic approaches to problem of eukaryotic development, emphasizing current research on regulation of gene enzyme systems.
Prerequisites
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: 3
Genetic structure and dynamics of populations, both real and ideal.

Prerequisites
BIOL 307 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
Different topics in different years, including molecular, developmental, physiological, and classical genetics, emphasizing current problems and research.

Prerequisites
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
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.

Prerequisites
BIOL 305, 306, or permission of instructor.
**BIOL 577 - Biogeochemistry: A Global Perspective**

Credits: 3  
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.

**Prerequisites**  
Introductory courses in ecology and chemistry, or permission of instructor.

**BIOL 578 - Mutation, DNA Repair, and Environmental Contamination**

Credits: 3  
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.

**Prerequisites**  
BIOL 307 and 311.

**BIOL 579 - Molecular Evolution and Conservation Genetics**

Credits: 3  
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.

**Prerequisites**  
BIOL 311.

**Corequisite**
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

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.

**Prerequisites**
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

Emphasizes marine biology of estuarine and coastal habitats of Chesapeake Bay region, and factors affecting distribution and abundance of organisms.

**Prerequisites**
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

Continues EVPP 546/BIOL 546 as the laboratory section focusing on the approach and methods of estuarine research, including analysis and communication of results.

**Prerequisites/Corequisites**
EVPP 546/BIOL 546

**Hours of Lecture or Seminar per week**
0
Hours of Lab or Studio per week
3

BIOL 583 - General Biochemistry

Credits: 4
Structure and function of proteins, carbohydrates and lipids, enzymology, and metabolism and its controls. Emphasizes chemistry of nitrogen compounds.

Prerequisites
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
Selected topics of laboratory procedures used in the study of eukaryotic cells.

Prerequisites
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
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.

Prerequisites
Introductory courses 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
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.

Prerequisites
Introductory courses 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 589 - Teaching Practicum

Credits: 1
Experience teaching biology in laboratory or in field under supervision of faculty member.

Prerequisites
Permission of instructor, chair, and course coordinator (if any).

Notes
Undergraduate assists instructor. May be repeated once.

Hours of Lecture or Seminar per week
0

Hours of Lab or Studio per week
3

BIOL 607 - Fundamentals of Ecology

Credits: 3
Cross-Listed with EVPP 607

Overview of concepts in physiological, population, community, and ecosystem ecology. Restricted to graduate students with little or no background in ecology.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0
BIOL 608 - Topics in Biology

Credits: 1-4
In-service course to strengthen and update teacher's knowledge of biology. Topics include organismal biology, cell biology, ecology, microbiology, or genetics.

Prerequisites
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
Provides basis for understanding proper application of bioremedial technologies to treatment for hazardous wastes. Includes evaluation of data to determine successful treatment.

Prerequisites
Course in microbiology and organic chemistry or biochemistry, 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
Laboratory exercises illustrate techniques to demonstrate microbial degradation, detection of microbes, isolation, and evaluation of physiological and genetic characteristics.

Prerequisites
Laboratory course in microbiology, or permission of instructor.

Notes
Open first to those enrolled in BIOL 610.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
4
BIOL 622 - Methods and Principles of Animal Taxonomy

Credits: 3
Theoretical basis of techniques in animal classification, emphasizing practical application to laboratory problem dealing with a particular animal group.

**Prerequisites**
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
Patterns of climate and weather, tectonics, soil formation, and surface water and groundwater movements.

**Prerequisites**
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
Study of relationships between microorganisms and their natural environment, and methodology for observing their natural environment and biochemical activities in that environment.

**Prerequisites**
Course in microbiology, or permission of instructor.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
3

BIOL 648 - Population Ecology
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.

**Prerequisites**
Course in 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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**BIOL 649 - Biological Resource Management**

Credits: 3
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.

**Prerequisites**
Course in 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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**BIOL 665 - Environmental Hazards to Human Health**

Credits: 3
Health effects of chemical contaminants of air, water, and food resulting from industrialized society. Includes identifying, evaluating, and controlling hazards.

**Prerequisites**
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

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**BIOL 666 - Human Genetics Concepts for Health Care**

Credits: 4
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.

**Prerequisites**
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
Experimental studies using current methods for purification and characterization of biologically important compounds. Provides training for research in molecular biology.

**Prerequisites**
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
Molecular mechanisms of bacterial pathogenicity, and immune response in infectious diseases.

**Prerequisites**
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**

Credits: 3
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.

**Prerequisites**
Course in ecology, environmental biology, or permission of instructor.
BIOL 675 - Aerosol Biology

Credits: 4
This course 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.

Prerequisites
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
Advanced course in applying probability and statistics to research in life sciences. Examples drawn from environmental, medical, physiological, genetic, and chemical biology.

Prerequisites
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
Structure and function of biomembranes, cytoskeleton, and transport systems. Also discusses protein trafficking, cell cycle, and cell adhesion molecules.

Prerequisites
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 690 - Introduction to Graduate Studies in Biology**

Credits: 1-2  
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

**BIOL 691 - Current Topics in Biology**

Credits: 1-4  
**Notes**  
May be repeated for credit.

**Hours of Lecture or Seminar per week**  
1-3  
**Hours of Lab or Studio per week**  
0-6

**BIOL 692 - Seminar in Biology**

Credits: 1  
Topics vary.

**Notes**  
May be repeated for credit.

**Hours of Lecture or Seminar per week**  
1  
**Hours of Lab or Studio per week**  
0

**BIOL 693 - Directed Studies in Biology**

Credits: 1-8  
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.

**Prerequisites**  
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
Review and discussion of recent literature in specialized area. Includes student presentations.

Notes
May be repeated for credit.

**BIOL 715 - Microbial Physiology**

Credits: 3
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.

Prerequisites
Undergraduate lecture/lab course in microbiology, and course in biochemistry.

**BIOL 718 - Techniques in Microbial Pathogenesis**

Credits: 3
Laboratory-based class in which students perform current techniques in microbial pathogenesis.

Prerequisites
Admission to biosciences PhD or biology MS program, and permission of instructor.
BIOL 720 - Microbial Metabolism

Credits: 3
Discussions of catabolic and anabolic pathways of bacterial pathogens, and regulation and integration of these pathways.

Prerequisites
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 745 - Environmental Toxicology

Credits: 3
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.

Prerequisites
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
Library, laboratory, or field investigation under supervisor's guidance.

Prerequisites
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
0
Hours of Lab or Studio per week
0

BIOL 798 - Master's Research Project
Credits: 1-3
Experimental or theoretical research project chosen and completed under guidance of graduate faculty member. Comprehensive report acceptable to student's advisory committee is required.

Prerequisites
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
0
Hours of Lab or Studio per week
0
Grading
S/NC

BIOL 799 - Thesis

Credits: 1-6
Thesis research under direction of supervisor.

Prerequisites
8 graduate credits in BIOL, and 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 799.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
0
Grading
S/NC

BIOL 800 - Studies for the Doctor of Philosophy in Education

Credits: variable
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.

Prerequisites
Admission to PhD in education program to study in biology.

Notes
Enrollment may be repeated.
BIOS 701 - Biochemical Systematics

Credits: 3
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?"

Prerequisites
General biochemistry.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

BIOS 702 - Research Methods

Credits: 3
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.

Prerequisites
Admission to PhD program in biosciences.

Hours of Lecture or Seminar per week
0

Hours of Lab or Studio per week
0

BIOS 703 - Laboratory Rotation

Credits: 1
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.

Prerequisites
Admission to PhD program in biosciences.

Notes
Should be repeated three times (except by permission of concentration director).

Hours of Lecture or Seminar per week
0

Hours of Lab or Studio per week
4
**BIOS 704 - Topics in Biosciences**

Credits: 1  
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.

**Prerequisites**  
Admission to PhD program in biosciences.

**Notes**  
Required of all students during each semester prior to advancement to candidacy. Should be repeated three times (except by permission of concentration director).

**Hours of Lecture or Seminar per week**  
1

**Hours of Lab or Studio per week**  
0

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**BIOS 710 - Current Topics in Bioscience**

Credits: 1-3  
Studies current topic in biosciences.

**Prerequisites**  
Admission to biosciences PhD or biology MS program.

**Notes**  
Topics vary. May be repeated for credit with permission of concentration director.

**Hours of Lecture or Seminar per week**  
1-3

**Hours of Lab or Studio per week**  
0

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**BIOS 740 - Laboratory Methods in Functional Genomics and Biotechnology**

Credits: 3  
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.

**Prerequisites**  
Admission to PhD program in biosciences, or permission of instructor.

**Hours of Lecture or Seminar per week**  
2

**Hours of Lab or Studio per week**  
3
BIOS 741 - Genomics

Credits: 3
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.

Prerequisites
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

BIOS 742 - Biotechnology

Credits: 3
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.

Prerequisites
Undergraduate course work in genetics and molecular biology.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

BIOS 743 - Genomics, Proteomics, and Bioinformatics

Credits: 3
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.

Prerequisites
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
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.

Prerequisites
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
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
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.

Prerequisites
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
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
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
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 898 - Directed Studies in Biosciences**

Credits: 1-12
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.

**Prerequisites**
Permission of research advisor.

**Hours of Lecture or Seminar per week**
0
**Hours of Lab or Studio per week**
0

**BIOS 899 - Directed Research in Biosciences**
Research on a pertinent topic in biosciences. Scope and subject of research to be determined by instructor.

**Prerequisites**
Permission of research advisor.

**Hours of Lecture or Seminar per week**
0

**Hours of Lab or Studio per week**
0

**BIOS 998 - Doctoral Dissertation Proposal**

Credits: 1-6
Research and writing of research proposal for doctoral dissertation.

**Prerequisites**
Permission of research advisor.

**Hours of Lecture or Seminar per week**
0

**Hours of Lab or Studio per week**
0

**Grading**
S/IP

**BIOS 999 - Doctoral Dissertation Research**

Credits: 1-24
Research in concentration pertinent to students' program of study.

**Prerequisites**
Approved dissertation proposal.

**Notes**
Maximum of 24 credits can be applied toward degree.

**Hours of Lecture or Seminar per week**
0

**Hours of Lab or Studio per week**
0

**Grading**
S/IP

**BIS 300 - Understanding Multidisciplinary Studies**
Credits: 3
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
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.

**Prerequisites**
BIS 300, 2.00 or above in ENGL 302.

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 391 - The Research Process for Honors**

Credits: 3
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.

**Prerequisites**
admission to BIS honors program, 3.5 or better in ENGL 302

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**BIS 399 - Special Topics**
Credits: 1-3
Selected topics reflecting interest in specialized areas.

Prerequisites
Open only to degree students in BIS.

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
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
0
Hours of Lab or Studio per week
0

BIS 490 - Senior Project

Credits: 3
Project or thesis on a topic directly relevant to student's concentration. Guided by student's faculty advisor and 490 instructor.

Prerequisites
BIS 390;

Corequisite
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
0
Hours of Lab or Studio per week
0

BIS 491 - Senior Project Presentation
Credits: 1
Focuses on preparation and delivery of a formal presentation of student's BIS 490 project. Includes review of basic presentation techniques.

Prerequisites
BIS 390;

Corequisite
BIS 490.

Notes
Open only to BIS majors.

Hours of Lecture or Seminar per week
1

Hours of Lab or Studio per week
0

**BIS 495 - Career Practicum**

Credits: 1-6
Supervised experience in application of specified area.

Prerequisites
Permission of instructor and BIS director.

Hours of Lecture or Seminar per week
1-6

Hours of Lab or Studio per week
0

**BULE 302 - Legal Environment of Business**

Credits: 3
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.

Prerequisites
Sophomore standing.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

When Offered
Fall, Spring, Summer.
BULE 402 - Commercial Law

Credits: 3
Survey of commercial law emphasizing the Uniform Commercial Code. Lecture, discussion, cases.

Prerequisites
BULE 302, degree status.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0
When Offered
Fall, Spring.

CDS 101 - Introduction to Computational and Data Sciences

Credits: 3
Introduction to the use of computers in scientific discovery through simulations and data analysis. Covers historical development and current trends in the field.

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
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.

Hours of Lecture or Seminar per week
1
Hours of Lab or Studio per week
0

CDS 301 - Scientific Information and Data Visualization

Credits: 3
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.

Prerequisites
CDS 101, CS 211, MATH 125, MATH 113.
CDS 302 - Scientific Data and Databases

Credits: 3
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.

Prerequisites
STAT 354, MATH 125.

CDS 385 - Materials Science with Applications to Renewable Energy

Credits: 3
Cross-Listed with PHYS 385
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.

Prerequisites
PHYS 262 or 266 or 245 and a C or better in MATH 113

CDS 401 - Scientific Data Mining

Credits: 3
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.

Prerequisites
CDS 302.
CDS 410 - Modeling and Simulations I

Credits: 3
Cross-Listed with MATH 447

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.

Prerequisites
MATH 214 or 216, and 446.

CDS 411 - Modeling and Simulations II

Credits: 3
This course covers the application of modeling and simulation methods to various scientific applications, including fluid dynamics, solid mechanics, materials science, molecular mechanics, and astrophysics. It will also provide an introduction to modeling and simulation software, as well as high-performance computing.

Prerequisites
CDS 410 or Math 447.

CDS 421 - Introduction to Computational Fluid Dynamics

Credits: 3
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.
Prerequisites
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
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.

Prerequisites
PHYS 510 and MATH 446.

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
Covers selected topics in computational and data sciences not covered in fixed content courses.

Prerequisites
Permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

CDS 487 - Electronic Structure Computations

Credits: 3
Covers computational aspects of materials science, such as first-principles methods of electronic structure calculations of 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.

Prerequisites
CDS 490 - Directed Study and Research

Credits: 3
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 up to a total of 6 credits.

Prerequisites
Permission of the instructor and the department chair. For computational and data science majors and minors in their junior or senior year only.

CDS 491 - Internship

Credits: 3
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 up to a total of 6 credits.

Prerequisites
Permission of the instructor and the department chair. For computational and data science majors and minors in their junior or senior year only.

CEIE 100 - Environmental Engineering around the World

Credits: 3
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.
CEIE 197 - Industrial Internship I-A

Credits: 0
Prepares for summer work experience in civil and infrastructure engineering positions with land development, architecture/engineering, and construction firms, or government.

Prerequisites
Civil and Infrastructure Engineering majors only.

Corequisite
ENGR 183.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
0
When Offered
S

CEIE 198 - Industrial Internship I-B

Credits: 0
Supervised 10-week summer work experience in civil and infrastructure engineering positions with land development, architecture/engineering and construction firms, or government.

Prerequisites
Grade of C or better in CEIE 197 and ENGR 183. Civil and Infrastructure Engineering majors only.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
0
When Offered
SUM

CEIE 199 - Industrial Internship I-C

Credits: 1
Evaluation of summer work experience in civil and infrastructure engineering positions with land development, architecture/engineering and construction firms, or government. Requires written report and presentation.
Prerequisites
Grade of C or better in CEIE 197 and ENGR 183. Civil and Infrastructure Engineering majors only.

Hours of Lecture or Seminar per week
1
Hours of Lab or Studio per week
0
When Offered
F

CEIE 230 - Hydraulics

Credits: 3
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.

Prerequisites
Grade of C or better in PHYS 160.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0
When Offered
F, S

CEIE 290 - Engineering Computation and Design

Credits: 3
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.

Prerequisites
Grade of C or better in ENGR 183.

Hours of Lecture or Seminar per week
2
Hours of Lab or Studio per week
3
When Offered
F, S

CEIE 297 - Industrial Internship II-A
CEIE 298 - Industrial Internship II-B

Credits: 0
Prepares for summer work experience in civil and infrastructure engineering positions with land development, architecture/engineering, and construction firms, or government.

Prerequisites
Civil and Infrastructure Engineering majors only.

Corequisite
ENGR 183

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
0
When Offered
S

CEIE 299 - Industrial Internship II-C

Credits: 1
Evaluation of summer work experience in civil and infrastructure engineering positions with land development, architecture/engineering and construction firms, or government. Requires written report and presentation.

Prerequisites
Grade of C or better in CEIE 297 and ENGR 183. Civil and Infrastructure Engineering majors only.

Hours of Lecture or Seminar per week
1
Hours of Lab or Studio per week
0
When Offered
F
CEIE 301 - Engineering and Economic Models in Civil Engineering

Credits: 3
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.

Prerequisites
Grade of C or better in STAT 344 and ENGR 117 or CS 112.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

When Offered
F

CEIE 305 - Soil Mechanics

Credits: 3
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.

Prerequisites
Grade of C or better in ENGR 210.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

When Offered
f, S

CEIE 311 - Structural Analysis

Credits: 3
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.

Prerequisites
Grade of C or better in ENGR 310.
CEIE 340 - Water Resource Engineering

Credits: 3
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.

Prerequisites
Grade of C or better in CEIE 230.

CEIE 355 - Environmental Engineering and Science

Credits: 3
A course in environmental science and engineering to introduce 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.

Prerequisites
Grade of C or better in CEIE 230, CHEM 211 or CHEM 251, and PHYS 266

CEIE 360 - Introduction to Transportation Engineering

Credits: 3
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.

**Prerequisites**  
Grade of C or better in ENGR 210, ENGL 302, and CEIE 290.

**Notes**  
Fulfills writing-intensive requirement for civil and infrastructure engineering major.

**Hours of Lecture or Seminar per week**  
2

**Hours of Lab or Studio per week**  
3

**When Offered**  
F, S

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**CEIE 370 - Construction Systems**

Credits: 3  
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.

**Prerequisites**  
Grade of C or better in CEIE 301

**Hours of Lecture or Seminar per week**  
3

**Hours of Lab or Studio per week**  
0

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**CEIE 397 - Industrial Internship III-A**

Credits: 0  
Prepares for summer work experience in civil and infrastructure engineering positions with land development, architecture/engineering, and construction firms, or government.

**Prerequisites**  
Civil and Infrastructure Engineering majors only.

**Corequisite**  
ENGR 183

**Hours of Lecture or Seminar per week**  
0

**Hours of Lab or Studio per week**  
0
When Offered
S

CEIE 398 - Industrial Internship III-B

Credits: 0
Supervised 10-week summer work experience in civil and infrastructure engineering positions with land development, architecture/engineering and construction firms, or government.

Prerequisites
Grade of C or better in CEIE 397 and ENGR 183. Civil and Infrastructure Engineering majors only.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
0
When Offered
SUM

CEIE 399 - Industrial Internship III-C

Credits: 1
Evaluation of summer work experience in civil and infrastructure engineering positions with land development, architecture/engineering and construction firms, or government. Requires written report and presentation.

Prerequisites
Grade of C or better in CEIE 397 and ENGR 183. Civil and Infrastructure Engineering majors only.

Hours of Lecture or Seminar per week
1
Hours of Lab or Studio per week
0
When Offered
F

CEIE 400 - Civil Engineering Planning and Management

Credits: 3
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.

Prerequisites
Grade of C or better in CEIE 311, CEIE 340, CEIE 355 and CEIE 360.
CEIE 401 - Sustainable Land Development

Credits: 3
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.

Prerequisites
Grade of C or better in CEIE 355, CEIE 340 and CEIE 360.

Corequisite
CEIE 400

CEIE 410 - Geographic Information Systems in Engineering

Credits: 3
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.

Prerequisites
Grade of C or better in CS 112 or ENGR 117, CEIE 355 and CEIE 360.

Notes
Credit is not given for both CEIE 410 and 510.
CEIE 411 - Introduction to Design and Inventive Engineering

Credits: 3
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.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0
When Offered
f

CEIE 412 - Structural Steel Design

Credits: 3
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.

Prerequisites
Grade of C or better in CEIE 311

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0
When Offered
s

CEIE 413 - Reinforced Concrete Design

Credits: 3
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.

Prerequisites
Grade of C or better in CEIE 311.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0
CEIE 440 - Water Supply and Distribution

Credits: 3
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.

Prerequisites
Grade of C or better in CEIE 230.

Notes
Credit is not given for both CEIE 440 and 550.

Hours of Lecture or Seminar per week
2
Hours of Lab or Studio per week
3
When Offered
f

CEIE 442 - Open Channel Flow

Credits: 3
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.

Prerequisites
Grade of C or better in CEIE 230

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
s

CEIE 450 - Environmental Engineering Systems
Credits: 3
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.

Prerequisites
Grade of C or better in CEIE 355.

Notes
Credit is not given for both CEIE 450 and CEIE 550.

CEIE 452 - Wastewater Management

Credits: 3
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. Also covers consequences of environmental policies; environmental impact assessments; and federal, state, and local government laws and regulations related to wastewater collection, treatment, and disposal.

Prerequisites
Grade of C or better in CEIE 355.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

When Offered
S

CEIE 456 - Environmental Law

Credits: 3
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.

Prerequisites
Grade of C or better in CEIE 355.

Notes
Credit is not given for both CEIE 456 and 556.
CEIE 461 - Traffic Engineering

Credits: 3
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.

Prerequisites
Grade of C or better in CEIE 360.

Notes
Credit is not given for both CEIE 461 and 561.

CEIE 462 - Urban Transportation Planning

Credits: 3
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.

Prerequisites
Grade of C or better in CEIE 360.

Notes
Credit is not given for both CEIE 462 and CEIE 562.
CEIE 470 - Construction Systems

Credits: 3
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.

Prerequisites
Grade of C or better in CEIE 301.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

When Offered
f, S

CEIE 471 - Construction Administration

Credits: 3
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.

Prerequisites
Grade of C or better in CEIE 370

Notes
Credit is not given for both CEIE 471 and CEIE 571.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

When Offered
f

CEIE 472 - Building Information Modeling

Credits: 3
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.
Prerequisites
Grade of C or better in CEIE 290 and CEIE 370.

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

CEIE 490 - Senior Design Project

Credits: 3
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 analyses, 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.

Prerequisites
Grade of C or better in CEIE 355, CEIE 400 and CEIE 440, CEIE 412 or CEIE 413.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

When Offered
F, S

CEIE 498 - Independent Study in Civil Engineering

Credits: 1-3
Directed self-study of special topics of current interest.

Prerequisites
60 credits; must be arranged with an instructor and approved by department chair before registering.

Notes
May be repeated for maximum 6 credits if topics are substantially different.

Hours of Lecture or Seminar per week
0

Hours of Lab or Studio per week
0
CEIE 499 - Special Topics in Civil Engineering

Credits: 3
Vary with nature of topic. Topics of special interest to undergraduates.

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

CEIE 500 - Land Development Engineering

Credits: 3
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.

Prerequisites
Graduate standing in CEIE.

Notes
Credit is not given for both CEIE 400 and 500.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

When Offered
F

CEIE 501 - Sustainable Development

Credits: 3
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.

Prerequisites
Graduate standing.
CEIE 510 - Geographic Information Systems in Engineering

Credits: 3
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.

Notes
Credit is not given for both CEIE 410 and 510.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0
When Offered
F

CEIE 511 - Introduction to Design and Inventive Engineering

Credits: 3
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
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

Prerequisites
CEIE 311

Notes
Credit is not given for both CEIE 412 and 512.

When Offered
s
CEIE 513 - Reinforced Concrete Design

Credits: 3
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.

Prerequisites
CEIE 311

Notes
Credit is not given for both CEIE 413 and 513.

When Offered

CEIE 516 - Engineering Law and Ethics

Credits: 3
Overview of body of law surrounding design, construction, and facilities maintenance and operations. Introduces tort law and its relationship to design and construction contracting. Uses case studies of contract form, general and special conditions, ethics, contract administration, claims, dispute resolution, arbitration, and appeals process.

Prerequisites
CEIE 400.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

CEIE 530 - Water Resource Systems Analysis

Credits: 3
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.

Prerequisites
CEIE 601 or equivalent.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0
When Offered
F

CEIE 540 - Water Supply and Distribution

Credits: 3
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.

Prerequisites
A course in hydraulics or fluid mechanics.

Notes
Credit is not given for both CEIE 440 and 540.

CEIE 542 - Open Channel Flow

Credits: 3
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.

Prerequisites
A course in hydraulics or fluid mechanics.

Notes
Credit is not given for both CEIE 442 and 542.

CEIE 550 - Environmental Engineering Systems

Credits: 3
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.

Prerequisites
CEIE 555.

Notes
Credit is not given for both CEIE 450 and 550.
**CEIE 552 - Wastewater Engineering**

Credits: 3  
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.

**Prerequisites**
CEIE 555.

**CEIE 555 - Introduction to Environmental Engineering**

Credits: 3  
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  
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.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

When Offered
S

CEIE 560 - Public Transportation Systems

Credits: 3
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.

Prerequisites
CEIE 360.

Notes
Credit is not given for both CEIE 460 and 560.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

When Offered
F

CEIE 561 - Traffic Engineering

Credits: 3
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.

Prerequisites
CEIE 360.

Notes
Credit is not given for both CEIE 461 and 561.
CEIE 562 - Urban Transportation Planning

Credits: 3
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.

Prerequisites
CEIE 360.

Notes
Credit is not given for both CEIE 462 and 562.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

When Offered
S

CEIE 565 - Design of Transport Systems

Credits: 3
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; guiderail 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.

Prerequisites
CEIE 360.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

CEIE 571 - Construction Administration

Credits: 3
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 CEIE471 and 571.

CEIE 572 - Building Information Modeling

Credits: 3
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 600 - Civil Engineering Infrastructure Planning and Management

Credits: 3
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
3

Hours of Lab or Studio per week
0

CEIE 601 - Infrastructure Modeling

Credits: 3
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.

Prerequisites
CEIE 605

Hours of Lecture or Seminar per week
3
CEIE 605 - Infrastructure Systems Analysis

Credits: 3
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.

Prerequisites
STAT 344.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

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CEIE 610 - Construction Systems and Management

Credits: 3
Studies applications of construction management concepts and techniques to the production of constructed system. Explores construction industry and environment through project cycle design and construction phases, emphasizing estimating, planning, scheduling, labor, money, materials, machines, time, and information. Uses popular scheduling software with class projects and case study.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

CEIE 631 - Water Resources Engineering I: Principles and Practice

Credits: 3
Introduction to the principles of hydrology and hydraulics, and their application to the planning, design and management of modern water resources.

Prerequisites
CEIE 340 or equivalent.

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CEIE 632 - Groundwater Systems Modeling

Credits: 3
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.

Prerequisites
CEIE 601

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

CEIE 660 - Urban Transportation Planning

Credits: 3
Quantitative and qualitative techniques in urban transportation planning. Topics include different levels of urban transportation planning; technical transportation planning process, including travel demand estimation, establishment of transportation strategies, and utility analysis; and activity center planning including on-site vehicle and pedestrian circulation, transportation interface, environmental planning, and planning administration.

Prerequisites
CEIE 601.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

CEIE 663 - Intelligent Transportation Systems

Credits: 3
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.

Prerequisites
CEIE 561 or 562.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0
CEIE 670 - Civil Engineering Decision Methods and Tools

Credits: 3
Principles of decision making and knowledge acquisition to build knowledge-based decision support tools for civil, environmental, and infrastructure engineering. Includes solving complex problems from several areas of urban systems engineering and using various decision-support tools based on Bayesian decision theory and principles of artificial intelligence, including knowledge-based systems and learning systems.

Prerequisites
CEIE 605

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

CEIE 671 - Best Engineering Management Practices

Credits: 3
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.

Prerequisites
Graduate standing.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

CEIE 673 - Leading Engineering Innovation

Credits: 3
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.

Prerequisites
Graduate standing

CEIE 674 - Infrastructure Finance
Credits: 3
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.

**Prerequisites**
Graduate standing

### CEIE 675 - Developing the Technical Enterprise

Credits: 3
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.

**Prerequisites**
Graduate standing

### CEIE 680 - Introduction to Infrastructure and Security Engineering

Credits: 3
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.

**Prerequisites**
BS in civil engineering, or permission of instructor.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

### CEIE 681 - Security of Structural Systems

Credits: 3
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.

**Prerequisites**
BS in civil engineering, or CEIE 412 or CEIE 413.

**Hours of Lecture or Seminar per week**
3
CEIE 683 - Water and Wastewater Systems Security

Credits: 3
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.

Prerequisites
BS in civil engineering, or CEIE 355 and 440.

CEIE 685 - Civil Engineering Information Management

Credits: 3
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.

CEIE 686 - Transportation System Security and Safety

Credits: 3
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.

**Prerequisites**
BS in engineering or permission of instructor.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

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**CEIE 690 - Topics in Civil Engineering**

Credits: 3
Topics not covered in the regular civil engineering offerings.

**Prerequisites**
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**
3

**Hours of Lab or Studio per week**
0

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**CEIE 732 - Water Resources Engineering II: Water Resource Systems**

Credits: 3
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.

**Prerequisites**
CEIE 631 or equivalent.

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**CEIE 762 - Transportation System Planning Models**

Credits: 3
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.
Prerequisites
CEIE 562 or 660; CEIE 601.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

CEIE 767 - Traffic Engineering Modeling and Analysis

Credits: 3
Covers basic principles of simulation; queuing 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.

Prerequisites
CEIE 561, 601.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

CEIE 795 - Civil and Infrastructure Engineering Seminar

Credits: 0
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.

Prerequisites
Graduate standing.

Hours of Lecture or Seminar per week
1

Hours of Lab or Studio per week
0

CEIE 796 - Directed Reading

Credits: 1-3
Reading on specific topic under direction of faculty member.

Prerequisites
Graduate standing and permission of instructor.
Notes
May be repeated with change in topic.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
0

CEIE 798 - Research Project in Civil Engineering

Credits: 3
Analyzes and investigates contemporary problem in civil, environmental, and infrastructure engineering. Requires prior approval by faculty member who supervises student's work.

Prerequisites
Permission of instructor

Corequisite
CEIE 795.

Notes
Written report also required.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
0

CEIE 799 - Master's Thesis

Credits: 1-6
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.

Prerequisites
18 credits of graduate-level course work and permission of instructor.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
0

CFRS 500 - Introduction to Technologies of Forensics Value

Credits: 3
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.
Prerequisites
Graduate standing

CFRS 660 - Network Forensics

Credits: 3
Cross-Listed with TCOM 660

This course 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.

Prerequisites
TCOM 509 and TCOM 529 and a working knowledge of computer programming.

CFRS 661 - Digital Media Forensics

Credits: 3
Cross-Listed with TCOM 661

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.

Prerequisites
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

CFRS 663 - Operations of Intrusion Detection for Forensics

Credits: 3
Cross-Listed with TCOM 663

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.

Prerequisites
TCOM 509 and TCOM 529 and a working knowledge of computer programming.

CFRS 664 - Incident Response Forensics
Cross-Listed with TCOM 664

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.

Prerequisites
TCOM 509 and TCOM 529.

CFRS 760 - Legal and Ethical Issues in IT

Credits: 3
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.

Prerequisites
CFRS 500

CFRS 770 - Fraud and Forensics in Accounting

Credits: 3
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.

Prerequisites
CFRS 500

CFRS 780 - Advanced Topics in Computer Forensics

Credits: 3
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.

Prerequisites
Permission of instructor

Notes
Repeatable within degree.
CFRS 790 - Advanced Computer Forensics

Credits: 3
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.

Prerequisites
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.

CHEM 101 - Introduction to Modern Chemistry

Credits: 3
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.

Notes
Not open to students majoring in chemistry. Credit will not be given for this course and CHEM 103. Fundamental principles of chemistry. No previous knowledge of chemistry assumed or required.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

CHEM 102 - Introduction to Organic, Biochemical, Pharmacological, and Fuel Chemistry

Credits: 3
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.

Prerequisites
Not open to students majoring in chemistry.

Notes
Not open to students majoring in chemistry. Course cannot be used in place of CHEM 313 or 314. Credit will not be given for this course and CHEM 104.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

CHEM 103 - Chemical Science in a Modern Society

Credits: 4
Terminal course in chemistry for nonscience and nursing majors. Principles and application of chemistry.

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.

3
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

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.)

Prerequisites
Not open to students majoring in chemistry.

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.

3
Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
3

CHEM 155 - Introduction to Environmental Chemistry I

Credits: 4
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.

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
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.

Prerequisites
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
Fundamental principles of atomic and molecular structure; chemical bonding; basic concepts of chemical reactions and thermochemistry; and properties of gases, liquids, and solids.

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
3

Hours of Lab or Studio per week
0

CHEM 202 - Introductory Chemistry II
Credits: 3
Fundamentals of reaction rates and equilibrium. Topics include kinetics, properties of solutions, ionic equilibrium, chemical thermodynamics, electrochemistry, and nuclear chemistry.

Prerequisites
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
3
Hours of Lab or Studio per week
0

CHEM 211 - General Chemistry

Credits: 4
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.

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
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.

Prerequisites
CHEM 211.

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
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.

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
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.

Prerequisites
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
3
Hours of Lab or Studio per week
0

CHEM 313 - Organic Chemistry

Credits: 3
Theoretical, synthetic, industrial, and biological aspects of the chemistry of carbon compounds.

Prerequisites/Corequisites
Corequisite CHEM 315

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0
CHEM 314 - Organic Chemistry

Credits: 3
Theoretical, synthetic, industrial, and biological aspects of the chemistry of carbon compounds.

Prerequisites
CHEM 313.

Corequisite
CHEM 318.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

CHEM 315 - Organic Chemistry Lab I

Credits: 2
Lab techniques and reactions arranged to accompany CHEM 313.

Prerequisites/Corequisites
Corequisite: CHEM 313.

Notes
One-hour recitation.

Hours of Lecture or Seminar per week
1
Hours of Lab or Studio per week
3

CHEM 318 - Organic Chemistry Lab II

Credits: 2
Continuation of CHEM 315, arranged to accompany CHEM 314.

Prerequisites
CHEM 315.

Corequisite
CHEM 314.

Notes
One-hour recitation.

Hours of Lecture or Seminar per week
CHEM 321 - Elementary Quantitative Analysis

Credits: 4
Principles of chemical analysis emphasizing ionic equilibria. Lab consists of gravimetric, volumetric, and instrumental methods illustrating principal types of quantitative determinations.

Hours of Lecture or Seminar per week
2

Hours of Lab or Studio per week
6

CHEM 322 - General and Biochemical Equilibrium

Credits: 2
Study of general and biochemical equilibria in gas phase, ionic, and heterogeneous systems. Topics include gas reactions, polyfunctional acids and bases, complexion formation, solubility and free energy relationships, and the use of computer algorithms to solve equilibrium problems.

Prerequisites
CS 103, 112, or 161.

Hours of Lecture or Seminar per week
2

Hours of Lab or Studio per week
0

CHEM 331 - Physical Chemistry I

Credits: 3
Yearlong survey covering topics including thermodynamics, equilibria, kinetics, solution properties, elementary quantum theory, electrochemistry, atomic and molecular structure, and nuclear chemistry.

Prerequisites
MATH 113, 114.

Prerequisites/Corequisites
PHYS 243 or 160.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0
CHEM 332 - Physical Chemistry II

Credits: 3
Yearlong survey covering topics including thermodynamics, equilibria, kinetics, solution properties, elementary quantum theory, electrochemistry, atomic and molecular structure, and nuclear chemistry.

Prerequisites
MATH 113, 114, CHEM 331.

Prerequisites/Corequisites
PHYS 243 or 160.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

CHEM 333 - Physical Chemistry for the Life Sciences I

Credits: 3
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.

Prerequisites
CHEM 211, 212; MATH 113.

Prerequisites/Corequisites
MATH 114.

Notes
Credit will not be given for both this course sequence and CHEM 331, 332.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

CHEM 334 - Physical Chemistry for the Life Sciences II

Credits: 3
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.

Prerequisites
CHEM 211, 212; MATH 113; CHEM 333.
Prerequisites/Corequisites
MATH 114.

Notes
Credit will not be given for both this course sequence and CHEM 331, 332.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

CHEM 336 - Physical Chemistry Lab I

Credits: 2
Quantitative experimental study of physicochemical principles. CHEM 336 and 337 constitute an introduction to the practice and theory of experimental physical chemistry.

Prerequisites/Corequisites
CHEM 331 or 333.

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
Continuation of CHEM 336.

Prerequisites/Corequisites
CHEM 332 or 334.

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
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**
3

**Hours of Lab or Studio per week**
0

**CHEM 350 - Computer Techniques for Chemistry**

Credits: 3
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.

**Prerequisites**
CHEM 313.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**CHEM 355 - Undergraduate Research**

Credits: 1-3
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.

**Prerequisites**
30 credits, chemistry major or minor.

**Hours of Lecture or Seminar per week**
0

**Hours of Lab or Studio per week**
1-6

**CHEM 401 - The Research Experience**

Credits: 3
Introduction to research on current problem in chemical sciences, under supervision of faculty advisor. Includes literature search, writing research proposal, attendance at scheduled seminars, written report including impact statement, and oral presentation.

**Prerequisites**
Completion or concurrent enrollment in all other required general education courses.
CHEM 422 - Instrumental Analysis

Credits: 3
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.

Prerequisites
CHEM 314, 321, and 331.

Hours of Lecture or Seminar per week
1
Hours of Lab or Studio per week
6

CHEM 423 - Instrumental Analysis Laboratory

Credits: 2
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.

Prerequisites
CHEM 422.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
6

CHEM 441 - Properties and Bonding of Inorganic Compounds

Credits: 3
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; and stereochemical, electronic, and magnetic properties of transition metal complexes and metal atom cluster compounds.

Prerequisites
CHEM 314 and 332.

Hours of Lecture or Seminar per week
3
**CHEM 445 - Inorganic Preparations and Techniques**

Credits: 2  
Application of techniques of inorganic chemistry to preparation, purification, and spectroscopic characterization of selected substances.

*Prerequisites*  
CHEM 321 and 441.

**Hours of Lecture or Seminar per week**  
0

**Hours of Lab or Studio per week**  
6

**CHEM 446 - Bioinorganic Chemistry**

Credits: 3  
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.

*Prerequisites*  
CHEM 314.

**Hours of Lecture or Seminar per week**  
3

**Hours of Lab or Studio per week**  
0

**CHEM 451 - Special Projects in Chemistry**

Credits: 2  
Introduction to chemical research or development. Includes literature search, conferences, and lab.

*Prerequisites*  
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**  
0
CHEM 452 - Special Projects in Chemistry

Credits: 2
Introduction to chemical research or development. Includes literature search, conferences, and lab.

Prerequisites
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
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.

Prerequisites
CHEM 313, 314, 321, 331-332 or 333-334; admission to Chemistry Department Honors Program; and permission of department research committee.

Notes
Credit will not be given for both these courses and CHEM 451, 452.

CHEM 456 - Honors Research in Chemistry

Credits: 3
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.

Prerequisites
CHEM 313, 314, 321, 331-332 or 333-334; admission to Chemistry Department Honors Program; and permission of department research committee.
research committee.

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 463 - General Biochemistry I

Credits: 4
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.

Prerequisites
CHEM 313, BIOL 213.

Hours of Lecture or Seminar per week
4

Hours of Lab or Studio per week
0

CHEM 464 - General Biochemistry II

Credits: 3
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.

Prerequisites
CHEM 463/BIOL 483.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

CHEM 465 - Biochemistry Lab

Credits: 2
Introduction to modern biochemical experimental methods of studying chemical and physical properties of biological molecules. Includes separation, identification, and characterization of biomolecules.

Corequisite
CHEM 463.
CHEM 467 - The Chemistry of Enzyme-Catalyzed Reactions

Credits: 3
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.

Prerequisites
CHEM 313 and 463.

CHEM 468 - Bioorganic Chemistry

Credits: 3
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.

Prerequisites
CHEM 314 and 463.

CHEM 470 - Laboratory Instructional Methods for Chemistry

Credits: 3
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.

Prerequisites
CHEM 314.

Hours of Lecture or Seminar per week
0

Hours of Lab or Studio per week
6
CHEM 490 - Undergraduate Seminar

Credits: 1
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.

Prerequisites
60 credits and must be a chemistry major or minor.

CHEM 500 - Selected Topics in Modern Chemistry

Credits: 3
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.

CHEM 505 - Hazardous Materials Waste Management

Credits: 1-3
Comprehensive review of subjects most frequently encountered in hazardous chemicals management.

Prerequisites
CHEM 313 or permission of instructor.

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CHEM 513 - Synthetic and Mechanistic Organic Chemistry

Credits: 3
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.

Prerequisites
CHEM 313 and 314.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

CHEM 521 - Theory of Analytical Processes

Credits: 3
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.

Prerequisites
CHEM 422 or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

CHEM 529 - Instrumental Techniques of Analysis

Credits: 2
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.

Prerequisites
CHEM 321 and 422 or 521, or permission of department.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
6
CHEM 531 - Elements of Physical Chemistry

Credits: 3
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.

Prerequisites
CHEM 314; PHYS 243, 245; and MATH 113; or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

CHEM 554 - Geochemistry of Environmental Hazards

Credits: 3
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.

Prerequisites
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: 3
Previous course in biology recommended but not required. Important biological compounds, including proteins, carbohydrates, lipids, and nucleic acids, and their interrelations.

Prerequisites
CHEM 313 and 314.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

CHEM 564 - General Biochemistry II
Credits: 3
Previous course in biology recommended but not required. Important biological compounds, including proteins, carbohydrates, lipids, and nucleic acids, and their interrelations.

Prerequisites
CHEM 313, 314; CHEM 563.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

CHEM 567 - The Chemistry of Enzyme-Catalyzed Reactions

Credits: 3
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.

Prerequisites
CHEM 313 and 463.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

CHEM 568 - Bioorganic Chemistry

Credits: 3
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.

Prerequisites
CHEM 314 and 463.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

CHEM 579 - Special Topics

Credits: 1-6
Current topics in chemistry, depending on instructor's specialty.
Prerequisites
CHEM 314 or permission of instructor.

Notes
May be repeated with different topics, with department approval.

Hours of Lecture or Seminar per week
1-6

Hours of Lab or Studio per week
0

CHEM 613 - Modern Polymer Chemistry

Credits: 3
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.

Prerequisites
CHEM 513 or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

CHEM 614 - Physical Organic Chemistry

Credits: 3
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.

Prerequisites
CHEM 314 or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

CHEM 617 - Organic Structural Spectroscopy

Credits: 3
Spectroscopic determination of organic molecular structure using 1H, 13H, 19F, and 31P nuclear magnetic resonance
spectroscopy and infrared, mass, ultraviolet and visible, and Raman spectroscopy. Organic core course.
Prerequisites
CHEM 314 or equivalent.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

CHEM 620 - Modern Instrumentation

Credits: 3
Cross-Listed with PHYS 533

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.

Prerequisites
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

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.

Prerequisites
CHEM 422 or 521, or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

CHEM 625 - Electroanalytical Chemistry

Credits: 3

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.
Prerequisites
CHEM 321 and 331.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

CHEM 633 - Chemical Thermodynamics and Kinetics

Credits: 3
Cross-Listed with CSI 711

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.

Prerequisites
CHEM 331 and 332.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

CHEM 646 - Bioinorganic Chemistry

Credits: 3
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.

Prerequisites
CHEM 441 or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

CHEM 651 - Environmental Chemistry of Organic Substances

Credits: 3
Prerequisites
One semester of physical chemistry, or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

CHEM 660 - Protein Biochemistry

Credits: 3
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.

Prerequisites
CHEM 463 or equivalent or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

CHEM 661 - Antibiotic Chemistry and Resistance

Credits: 3
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.

Prerequisites
CHEM 463 (or equivalent), or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

CHEM 662 - Modern Methods of Drug Discovery

Credits: 3
Introduction to the process of drug discovery. Covers modern methods and strategies of target identification, lead identification, and lead optimization. Biochemistry core course.

Prerequisites
CHEM 463 (or equivalent), or permission of instructor.
3
Hours of Lab or Studio per week
0

CHEM 665 - Protein-Protein Interactions: Methods and Applications

Credits: 3
Introduction to the fundamental principles of protein-protein interactions, including experimental design considerations and methods for quantification of these interactions.

Prerequisites
CHEM 463 (or equivalent), or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

CHEM 670 - Teaching Practicum

Credits: 1-2
Prelaboratory lecture and laboratory teaching in chemistry. Students work closely with faculty and are responsible for all aspects of teaching undergraduate laboratory techniques.

Prerequisites
Enrollment in graduate program and demonstrated proficiency in English language.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
0

CHEM 728 - Introduction to Solid Surfaces

Credits: 3
Cross-Listed with CSI 712
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.

Prerequisites
CHEM 422 or equivalent.

Hours of Lecture or Seminar per week
3
CHEM 730 - Statistical Mechanics

Credits: 3
Cross-Listed with CSI 782/PHYS 711

Statistical methods, systems of particles, thermodynamics, macroscopic parameters, the ideal gas, kinetic theory, quantum statics, and transport processes.

Prerequisites
Permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

CHEM 732 - Quantum Chemistry

Credits: 3
Cross-Listed with CSI 713

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.

Prerequisites
CHEM 332.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

CHEM 733 - Polymer Physical Chemistry

Credits: 3

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, piezo and pyroelectric behavior, and nonlinear optical properties.

Prerequisites
CHEM 332 or permission of instructor.

Hours of Lecture or Seminar per week
CHEM 735 - Astrophysical Chemistry of Planetary Bodies

Credits: 3
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.

Prerequisites
CHEM 331, or ASTR 403, or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

CHEM 736 - Computational Quantum Mechanics

Credits: 3
Cross-Listed with CSI 783/PHYS 736

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.

Prerequisites
PHYS 502, 510, or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

CHEM 767 - Industrial Biochemistry

Credits: 3
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.

Prerequisites
CHEM 463 or permission of instructor.

Hours of Lecture or Seminar per week
CHEM 790 - Graduate Seminar

Credits: 1
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.

Prerequisites
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.

CHEM 791 - Graduate Research Methods and Presentation

Credits: 3
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.

Prerequisites
Permission of academic advisor, research advisor and/or research committee.

CHEM 796 - Directed Reading and Research

Credits: 1-6
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.

Prerequisites
Admission to a graduate program in chemistry and biochemistry or affiliated programs.
CHEM 798 - Research Project

Credits: 3-6
Experimental or theoretical research project chosen and completed under guidance of graduate faculty member.

Prerequisites
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.

CHEM 799 - Master's Thesis

Credits: 1-6
Laboratory thesis research and writing under direction of supervisor.

Prerequisites
Permission of department.

Notes
Minimum of 3 credits for first two enrollment periods.

CHEM 998 - Doctoral Dissertation Proposal

Credits: 1-12
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
doctrinal degree requirements, with no more than 12 credits of CHEM 998.

**Prerequisites**
Permission of research advisor and/or graduate committee.

**CHEM 999 - Doctoral Dissertation Research**

Credits: 1-12
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.

**Prerequisites**
Admission to candidacy in Chemistry and Biochemistry Doctoral Program.

**CHIN 101 - Elementary Chinese**

Credits: 3
Introduction to Mandarin, including basic grammar, oral expression, listening comprehension, reading, and writing.

**Notes**
Lab work required. Students may not receive credit for CHIN 101 and CHIN 109 or 110.

**CHIN 102 - Elementary Chinese**

Credits: 3
Continuation of CHIN 101.
Prerequisites
CHIN 101.

Notes
Lab work required. 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
1

CHIN 109 - Intensive Elementary Chinese

Credits: 6
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. Lab work required. 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
2

CHIN 110 - Elementary Chinese

Credits: 6
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
Further development of skills acquired in CHIN 101 and 102, including grammar, oral expression, listening comprehension, reading, and writing.

Prerequisites
CHIN 102 or equivalent.

Notes
CHIN 201 and 202 must be taken in sequence. Lab work required. 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
1

CHIN 202 - Intermediate Chinese II

Credits: 3
Continuation of CHIN 201.

Prerequisites
CHIN 201 or equivalent.

Notes
Lab work required. 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
1

CHIN 209 - Intensive Intermediate Chinese

Credits: 6
Recommended for students who desire training in Chinese to an intermediate level of competence in a relatively short period of time.

Prerequisites
CHIN 102, 109, appropriate placement score, or permission of instructor.

Notes
Equivalent to CHIN 201 and 202 taught in single semester. Lab work required. 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
2

CHIN 210 - Intermediate Chinese
Credits: 3
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.

Prerequisites
CHIN 110 or appropriate placement score.

Notes
Lab work required. 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
1

CHIN 250 - Gateway to Advanced Chinese

Credits: 3
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. Taught in Chinese.

Prerequisites
CHIN 210, appropriate placement score, or permission of department.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

CHIN 300 - Reading Skills Development

Credits: 3
Develops reading proficiency, emphasizing vocabulary and grammar of standard written Chinese. Introduction to discourse structure, sociolinguistic and cultural knowledge, and strategies for reading Chinese at advanced level.

Prerequisites
CHIN 250, appropriate placement score or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

CHIN 301 - Advanced Grammar and Syntax

Credits: 3
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.

**Prerequisites**
CHIN 250 or equivalent; 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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**CHIN 305 - Chinese for the Business World**

Credits: 3
Introduces terminology and structure of business Chinese. Emphasizes acquiring vocabulary and developing facility in Chinese business articles and correspondence.

**Prerequisites**
CHIN 250 or equivalent; appropriate placement score; or permission of instructor.

**Notes**
May be repeated for credit with permission of department when content is different.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

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**CHIN 310 - Survey of Chinese Literature**

Credits: 3
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.

**Prerequisites**
ENGL 101, or permission of instructor.

**Notes**
Knowledge of Chinese language helpful but not required. Course work in English. May be repeated for credit once when course content 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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**CHIN 311 - Modern Chinese Literature in Translation**
Credits: 3
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.

Prerequisites
ENGL 101, or permission of instructor.

Notes
Knowledge of Chinese language helpful but not required. Course work in English. May be repeated for credit once when course content is different, with approval from 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
Introduces basic structures and vocabulary of Classical Chinese, which still has a large influence on the formal written prose of modern newspapers and documents.

Prerequisites
CHIN 250, appropriate placement score, or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

CHIN 320 - Contemporary Chinese Film

Credits: 3
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
Knowledge of Chinese language helpful but not required. Course work in English.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

CHIN 325 - Major Chinese Writers
Studies works of major Chinese writers.

Prerequisites
ENGL 101, or permission of instructor.

Notes
Writers vary. Course work in English. May be repeated for credit up to two times with permission of department. Knowledge of Chinese helpful but not required.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

CHIN 328 - Asian American Women Writers

Credits: 3
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.

Notes
Knowledge of Asian languages not required. Course work in English.

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
Close readings and discussions of primary texts covering major periods in Chinese poetry to 1949. Analyzes variety of themes, forms, and styles.

Prerequisites
CHIN 300, or permission of instructor.

Notes
Knowledge of Chinese required. May be repeated once for credit.

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
Close readings and discussions of primary texts after Cultural Revolution. Analyzes themes, subjects, language, and styles.

Prerequisites
CHIN 300, or permission of instructor.

Notes
Knowledge of Chinese required. May be repeated once for credit.

Hours of Lecture or Seminar per week
3

CHIN 470 - Special Topics in Chinese Studies

Credits: 3
Special topics on Chinese language, literature, or culture organized by theme, genre approach, or era. May be repeated once for credit when topic is different with permission of department.

Hours of Lecture or Seminar per week
3

CHIN 480 - Fourth-Year Chinese I

Credits: 3
Advanced work in major grammatical and lexical topics of Chinese. Applies theoretical principles to guided written and oral exercises.

Prerequisites
CHIN 300 and 301; appropriate placement score or permission of instructor.

Hours of Lecture or Seminar per week
3

CHIN 481 - Fourth-Year Chinese II

Credits: 3
Advanced work in major grammatical and lexical topics of Chinese. Applies theoretical principles to guided written and oral exercises.
Prerequisites
CHIN 300, 301, 480; and appropriate placement score or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

CHSS 101 - Presenting and Processing Information Using Technology

Credits: 1-3
Presents practical experience in computer applications.

Prerequisites
Varies with topic.

Notes
Topics vary; most require laboratory work. May be repeated for credit when course content differs.

Hours of Lecture or Seminar per week
0-3
Hours of Lab or Studio per week
0-3

CHSS 200 - Introduction to Science and Society

Credits: 2
Provides students in the interdisciplinary minor in science and society with general background information and a 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 CHSS 400.

Hours of Lecture or Seminar per week
2
Hours of Lab or Studio per week
0

CHSS 313 - Mystery, Madness, and Murder

Credits: 3
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.

Prerequisites
Completion or concurrent enrollment in all other required general education courses.
CHSS 390 - Peer Tutoring in Writing across the Disciplines

Credits: 1
Student must submit two faculty recommendations and a sample of recent academic writing, and complete an interview with the director of the Writing Center. 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.

Prerequisites
Grade of A in ENGL 302, 60 credits, and overall GPA of 3.00 or higher with a GPA in major of 3.50 or higher.

Notes
May be repeated up to three times.

CHSS 395 - Technology Apprenticeship

Credits: 3
Experiential learning course in using technology in instruction.

Prerequisites
30 credits; GPA of 2.50 or higher; ability to use Internet browser; and skills in keyboarding, data entry, and word processing.

Notes
Students receive up to 45 hours of instruction and work 90 hours with faculty members, assisting with technology project. Students submit faculty recommendation and application to technology apprenticeship coordinator. May be repeated once for credit.

CHSS 400 - Perspectives on Science and Society

Credits: 1
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.

Prerequisites
CHSS 200 and completion of 17 credits toward the minor in science and society.

Hours of Lecture or Seminar per week
1

Hours of Lab or Studio per week
0

CHSS 485 - International Internship

Credits: 3-9
Students should contact faculty director one semester prior to semester of enrollment. Work at oversees locations under faculty director and site supervisor. Predeparture orientation; minimum 45 hours of work for each credit (in 3-, 6-, and 9-credit increments); and written assignments as specified in learning contract approved by faculty director, including journals, work products and reports, reflective essays, and research papers.

Prerequisites
60 credits, 2.50 GPA, and successful completion of application and selection process.

Hours of Lecture or Seminar per week
0

Hours of Lab or Studio per week
0

CHSS 490 - Faculty-Student Research Apprenticeship

Credits: 3
Open only to recipients of the provost's Faculty-Student Apprenticeship Award. Introduces scholarship in action in major field of study. Complements and enriches required course material, and provides undergraduates the unique opportunity to work collaboratively with faculty on research projects.

Prerequisites
60 credits, and permission of instructor.

Hours of Lecture or Seminar per week
0

Hours of Lab or Studio per week
0

CL 300 - Introduction to Comparative Literature

Credits: 3
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.

Prerequisites
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
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.

Prerequisites
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

CLAS 240 - Greek and Latin Elements in English

Credits: 3
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.

Prerequisites
ENGL 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
Illustrates role of classical myths in classical and modern literature and art.

Prerequisites
ENGL 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
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.

Prerequisites
ENGL 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
Examines development of classical epic as genre, from beginnings with Homer to transformations in the works of later Greek and Roman authors.

Prerequisites
ENGL 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
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.

**Prerequisites**
ENGL 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

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**CLAS 360 - Greek and Roman Comedy**

Credits: 3
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.

**Prerequisites**
ENGL 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

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**CLAS 370 - Greek and Roman Historians**

Credits: 3
Examines writings of major Greek and Roman historians, including Herodotus, Thucydides, Sallust, Livy, and Tacitus; their interpretations of the past; and their influence.

**Prerequisites**
ENGL 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 380 - Greek and Roman Novels

Credits: 3
Examines novels written in antiquity, and influences on postclassical and modern literature. Emphasizes works of Longus, Heliodorus, Petronius, and Apuleius.

Prerequisites
ENGL 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 390 - Topics in Classical Literature and Culture

Credits: 3
Certain topics may have other CLAS courses as prerequisites. Studies forms, contexts, and developments of distinctive literary genre or cultural phenomenon in Greco-Roman world.

Prerequisites
ENGL 101 or equivalent, or permission of instructor.

Notes
Course work in English. May be repeated once for credit.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

CLAS 499 - Senior Seminar in Classical Studies

Credits: 3
Individual research on specialized topic culminating in seminar paper. Fulfills writing-intensive requirement. Subject of seminar determined by instructor in consultation with student.

Prerequisites
Modern and classical languages majors concentrating in classical studies, 90 credits, and permission of instructor.

Notes
Permission must be obtained in advance. Students may present no more than 3 credits for graduation.

Hours of Lecture or Seminar per week
3
**CLIM 101 - Weather, Climate, and Society**

Credits: 3
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.

**Prerequisites**
None.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**CLIM 662 - Statistical Methods in Climate Research**

Credits: 3
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.

**Prerequisites**
Undergraduate-level linear algebra and STAT 344 (or equivalent), 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
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.

**Prerequisites**
BS or MS in mathematics or a physical science, or permission of instructor.
CLIM 711 - Introduction to Atmospheric Dynamics

Credits: 3
Cross-Listed with PHYS 676

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.

Prerequisites
BS or MS in mathematics or a physical science, or permission of instructor.

CLIM 712 - Physical and Dynamical Oceanography

Credits: 3
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.

Prerequisites
BS or MS in mathematics or a physical science, or permission of instructor.

CLIM 713 - Atmosphere-Ocean Interactions

Credits: 3
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.
Prerequisites
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
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.

Prerequisites
BS or MS in mathematics or physical science, or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

CLIM 715 - Numerical Methods for Climate Modeling

Credits: 3
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.

Prerequisites
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 750 - Geophysical Fluid Dynamics

Credits: 3
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.

**Prerequisites**
CLIM 711, or permission of instructor.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

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**CLIM 751 - Predictability of Weather and Climate**

Credits: 3
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.

**Prerequisites**
CLIM 711 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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**CLIM 752 - Ocean General Circulation**

Credits: 3
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.

**Prerequisites**
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

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**CLIM 753 - General Circulation of the Atmosphere**
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.

**Prerequisites**
CLIM 710 and 711.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

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**CLIM 759 - Topics in Climate Dynamics**

Credits: 3
Covers selected topics in climate dynamics not covered in fixed-content courses.

**Prerequisites**
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

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**CLIM 762 - Statistical Methods in Climate Research**

Credits: 3
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.

**Prerequisites**
Undergraduate-level linear algebra and STAT 344 (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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**CLIM 796 - Directed Reading and Research**
Credits: 1-6
Reading and research on a specific topic in climate dynamics under the direction of a faculty member.

**Prerequisites**
Admission into climate dynamics doctoral program and permission of instructor.

**Notes**
May be repeated as necessary.

**Hours of Lecture or Seminar per week**
0

**Hours of Lab or Studio per week**
0

**CLIM 991 - Climate Dynamics Seminar**

Credits: 1
Presentations in climate dynamics field by Mason faculty and invited speakers.

**Prerequisites**
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**

Credits: 1-6
Reading and research on a specific topic in climate dynamics under the direction of a faculty member.

**Prerequisites**
Admission into climate dynamics doctoral program and permission of instructor.

**Notes**
May be repeated as necessary.

**Hours of Lecture or Seminar per week**
0

**Hours of Lab or Studio per week**
0

**CLIM 998 - Doctoral Dissertation Proposal**
Credits: 1-12
Covers development of research proposal under guidance of dissertation director and doctoral committee. Proposal forms basis for climate dynamics doctoral dissertation.

Prerequisites
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.

CLIM 999 - Doctoral Dissertation

Credits: 1-12
Doctoral dissertation research under direction of dissertation director.

Prerequisites
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.

COMM 100 - Public Speaking

Credits: 3
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.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0
**COMM 101 - Interpersonal and Group Interaction**

Credits: 3  
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.

_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  
Intensive work in creative forensics events, including rhetorical criticism and informative, persuasive, extemporaneous, after-dinner, and impromptu speaking.

_prerequisites_  
Audition.

_notes_  
May be taken four times.

_hours of lecture or seminar per week_  
0

_hours of lab or studio per week_  
6

**COMM 141 - Forensics Seminar in Recreative Arts**

Credits: 1  
Intensive work in recreative forensic events, including dramatic duo, program interpretation, poetry interpretation, dramatic interpretation, and prose interpretation.

_prerequisites_  
Audition.

_notes_  
May be taken four times.

_hours of lecture or seminar per week_  
0

_hours of lab or studio per week_  
6

**COMM 142 - Forensics Seminar in Debate: Affirmative Strategies**
Credits: 1
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**
0
**Hours of Lab or Studio per week**
6

**COMM 143 - Forensics Seminar in Debate: Negative Strategies**

Credits: 1
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
**Hours of Lab or Studio per week**
6

**COMM 145 - Newspaper Workshop I**

Credits: 1
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
Practical experience in production, news writing, promotions, advertising, public relations, programming, or newscasting for student radio station WGMU.

Prerequisites
100-level COMM course, or permission of instructor.

**Notes**  
May be taken three times.

**Hours of Lecture or Seminar per week**  
1

**Hours of Lab or Studio per week**  
3

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**COMM 150 - Communication Skills for International Students**

Credits: 3  
Introduction to speaking, listening, and nonverbal skills required to communicate appropriately in university study.

**Prerequisites**  
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

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**COMM 157 - Video Workshop**

Credits: 1  
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

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**COMM 200 - Introduction to Communication**

Credits: 3  
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.

**Notes**  
May be repeated only once.
COMM 201 - Small Group Communication

Credits: 3
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.

Prerequisites
COMM 101 or equivalent course.

COMM 202 - Mass Media and Communication Systems

Credits: 3
Study of the development of various telecommunications and media systems in the United States, including print media, motion pictures, recording industry, telegraphy and telephony, broadcasting and cable, and new communications technologies.

COMM 203 - Introduction to Journalism

Credits: 3
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.

COMM 210 - Voice and Articulation
Credits: 3
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
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.

**Hours of Lecture or Seminar per week**
3
**Hours of Lab or Studio per week**
0

**COMM 255 - Introduction to Media Literacy**

Credits: 3
Principles and practices of media literacy. Emphasizes critical viewing, listening, and reading media skills; and media effects on consumer.

**Hours of Lecture or Seminar per week**
3
**Hours of Lab or Studio per week**
0

**COMM 260 - Basic Debate Theory and Practice**

Credits: 3
Theory and practice of formal debate, including approaches to analytical reasoning, research, delivery, and conceptual basis for debate. Does not require tournament participation.

**Hours of Lecture or Seminar per week**
1
**Hours of Lab or Studio per week**
3

**COMM 261 - Theories of Argumentation**
Credits: 3
Analyzes argument within communicative settings. Emphasizes deductive and inductive forms of reasoning, fallacies in reasoning, tests of evidence, and models for such analyses.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

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**COMM 300 - Foundations of Public Communication**

Credits: 3
Theories and principles of public communication, emphasizing methods of persuasion, critical analysis, speaker-listener alignments in public setting, and measurements of effective public communication.

**Prerequisites**
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

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**COMM 301 - Foundations of Interpersonal Communication**

Credits: 3
Theories and principles of interpersonal communication emphasizing models of communication, verbal and nonverbal message systems, and analysis of communicative relationships.

**Prerequisites**
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

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**COMM 302 - Foundations of Mass Communication**

Credits: 3
Theories and principles of mass communication emphasizing effects, the media as institution, and role of society.

**Prerequisites**
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
COMM 303 - Writing across the Media

Credits: 3
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.

Prerequisites
30 credits and ENGL 302.

Notes
Prerequisite for all communication media writing courses. Lab work required.

COMM 305 - Foundations of Intercultural Communication

Credits: 3
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.

Prerequisites
3 credits of 100 or 200-level COMM courses or 60 credits; grade of C or better in COMM 200.

COMM 306 - Issues in Intercultural Communication

Credits: 3
Applies basic principles of intercultural communication to analyze specific situations involving communication and cultural differences.

Prerequisites
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

Credits: 3
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.

Prerequisites
Permission of instructor

Notes
May be repeated once with a different field of study.

COMM 310 - Oral Interpretation

Credits: 3
Principles and theories of oral interpretation. Practice in oral communication of prose, poetry, and drama.

COMM 320 - Business and Professional Communication

Credits: 3
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.
Social and political forces of contemporary era from communication perspective, emphasizing political leadership, pressures for social and political change, and transformations in communicative environment.

Prerequisites
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
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.

Prerequisites
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
Theory, principles, and methods to analyze nonverbal communication. Emphasizes physical behavior, facial expression, personal space and territoriality, physical appearance, vocal cues, and environment.

Prerequisites
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
Theory, practice, and methods to analyze communication in organizations. Emphasizes process and structure, interaction formats, mechanisms for modification, and career paths in organizational communication.
Prerequisites
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
Intensive work in various types of creative forensics events, including rhetorical criticism and informative, persuasive, extemporaneous, after-dinner, and impromptu speaking.

Prerequisites
4 credits of COMM 140, or 60 credits and audition.

Notes
May be taken four times.

Hours of Lecture or Seminar per week
0

Hours of Lab or Studio per week
6

COMM 341 - Forensics Seminar in Recreative Arts

Credits: 1
Intensive work in various types of recreative forensics events, including dramatic duo, program interpretation, poetry interpretation, dramatic interpretation, and prose interpretation.

Prerequisites
4 credits of COMM 141, or 60 credits and audition.

Notes
May be taken four times.

Hours of Lecture or Seminar per week
0

Hours of Lab or Studio per week
6

COMM 342 - Forensics Seminar in Debate: Affirmative Strategies

Credits: 1
Work in affirmative research, case construction, and oral presentation directed toward affirmative analysis of intercollegiate
debate proposition.

**Prerequisites**
4 credits of COMM 142, or 60 credits and audition.

**Notes**
May be taken four times.

**Hours of Lecture or Seminar per week**
0

**Hours of Lab or Studio per week**
6

**COMM 343 - Forensics Seminar in Debate: Negative Strategies**

Credits: 1
Work in negative research, case attacks, and oral presentation directed toward negative analysis of intercollegiate debate proposition.

**Prerequisites**
4 credits of COMM 143, or 60 credits and audition.

**Notes**
May be taken four times.

**Hours of Lecture or Seminar per week**
0

**Hours of Lab or Studio per week**
6

**COMM 344 - Parliamentary Procedure**

Credits: 1
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.

**Prerequisites**
60 credits, or permission of instructor.

**Hours of Lecture or Seminar per week**
1

**Hours of Lab or Studio per week**
0

**COMM 345 - Newspaper Workshop II**
Credits: 1
Practical experience in writing and editing for student newspaper or other papers.

Prerequisites/Corequisites
3 credits of COMM 145, COMM 351, or permission of instructor

Notes
May be taken three times.

Hours of Lecture or Seminar per week
1
Hours of Lab or Studio per week
2

COMM 346 - Yearbook Workshop

Credits: 1
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.

Hours of Lecture or Seminar per week
1
Hours of Lab or Studio per week
2

COMM 348 - Radio Workshop II

Credits: 1
Intense practical application of previously acquired skills in production, promotions, advertising, public relations, programming, or news writing for student radio station WGMU.

Prerequisites
COMM 148, or permission of instructor.

Notes
May be taken three times.

Hours of Lecture or Seminar per week
1
Hours of Lab or Studio per week
3

COMM 350 - Mass Communication and Public Policy
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.

**Prerequisites**
COMM 102, 202, or 302; or permission of instructor.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**COMM 351 - News Writing and Reporting**

Credits: 3
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.

**Prerequisites**
COMM 303.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**COMM 352 - News Editing: Print and Beyond**

Credits: 3
Copy preparation, headline writing, news judging, and layout for various forms of print and electronic formats. Introduces working on news copy desks.

**Prerequisites**
COMM 303.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**COMM 353 - Broadcast Journalism**

Credits: 3
Prerequisites
COMM 303.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

COMM 354 - Radio Production

Credits: 3
Theory and practice of operational radio broadcasting. Topics include programming, production, and promotion aspects of commercial and noncommercial radio.

Prerequisites
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

General introduction to video production including camera, audio, lighting, and editing. Lab work required.

Prerequisites
Successful completion of COMM 355 (with a C or better) is a prerequisite for all advance-level production courses.

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
Writing for video, performance skills for on-air work, interviewing.

Hours of Lecture or Seminar per week
COMM 358 - Video Producing and Directing

Credits: 3
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.

Prerequisites
COMM 355 with a grade of 2.00 or portfolio assessment.

Hours of Lecture or Seminar per week
2
Hours of Lab or Studio per week
4

COMM 359 - Media Management

Credits: 3
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
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
Focuses on online journalism, research, reporting, web page and weblog creation, and writing for Internet.

Prerequisites
COMM 303, or permission of instructor

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

COMM 362 - Argument and Public Policy

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.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

COMM 363 - Media Career Seminar

Practicum for students with production experience; students produce a final resume in area of expertise.

Prerequisites
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

Focus on camera techniques such as framing, editing within the camera, shot composition, storyboarding, camera angles, video levels, and continuity.

Prerequisites
COMM 355 with a grade of 2.00 or better or portfolio assessment.

Hours of Lecture or Seminar per week
3
COMM 365 - Women and Media

Credits: 3
Introduces concepts of power, influence of mass media. Allows students to see themselves as products, producers of media influence, and gives sense of women's roles as media professionals and consumers.

Prerequisites
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
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.

Prerequisites
IT 103 and COMM 355.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

COMM 369 - Telecommunications Systems

Credits: 3
Studies evolution and operation of telecommunications systems from wireline telegraphy to wireless voice, video, and data services. Topics include communication coding systems, analog and digital modulation schemes, twisted-pair telephony, broadband coaxial cable, and high-power direct-to-home digital satellite.

Prerequisites
60 credits, or permission of instructor
COMM 370 - Feature Writing

Credits: 3
Introduces aspiring journalists to research techniques and critical writing skills needed to produce publishable magazine or newspaper feature stories.

Prerequisites
COMM 303.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

COMM 371 - Sports Writing and Reporting

Credits: 3
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.

Prerequisites
COMM 303 or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

COMM 373 - Business and Economic Journalism

Credits: 3
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.

Prerequisites
COMM 303 or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0
COMM 374 - Political Journalism

Credits: 3
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.

Prerequisites
COMM 303 or permission of instructor.

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
History, regulation, and ratings of advertising, as well as media buying, advertising campaigns, and strengths and weaknesses of media vehicles used in advertising.

Prerequisites
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
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
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.

**Prerequisites**
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 - Case Studies in Public Relations**

Credits: 3
Focuses on current issues in corporate, government, and nonprofit public relations.

**Prerequisites**
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
Focuses on public relations writing including news releases, client memos, broadcasting, speeches, brochures, journals, and advertisements. Includes writing styles, formats, organization, and writing research.

**Prerequisites**
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
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
COMM 399 - Special Topics in Communication

Credits: 1-3
Topics vary; some require laboratories.

Prerequisites
Permission of instructor.

Notes
May be repeated.

COMM 400 - Research Methods in Communication

Credits: 3
Explores applications for primary research methodologies used in communication. Research project, with focus on survey, critical ethnographic, or experimental methodologies.

Prerequisites
COMM 200; and at least two of COMM 300, 301, 302 or 305.

COMM 401 - Interpersonal Communication in the Workplace

Credits: 3
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.

Prerequisites
COMM 301, or permission of instructor.

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  
**Cross-Listed with GOVT 412**

Covers responsibilities, freedoms of mass media in a democracy; and media influence on citizens' opinions, elections, and decisions of public officials.

**Prerequisites**  
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  
Explores primary theories explaining human communicative behavior, including traditional rhetorical, contemporary social science, critical, and mass communication.

**Prerequisites**  
Minimum satisfactory grade in COMM 200, 300, 301, and 302.

**Hours of Lecture or Seminar per week**  
3  
**Hours of Lab or Studio per week**  
0

**COMM 425 - Honors Seminar in Communication**

Credits: 3  
Examines foundations, connectedness, and applications of numerous communication theories across the discipline.

**Prerequisites**  
80 credits, cumulative GPA of 3.50.

**Notes**  
Honors project required.

**Hours of Lecture or Seminar per week**  
3
COMM 430 - Persuasion

Credits: 3
Theories of persuasive communication including traditional and contemporary attitudinal change; relationship among speaker, message, and audience; and relationship between attitudinal and behavioral change.

Prerequisites
COMM 230 or permission of instructor.

COMM 431 - Information Technology and the Political Process

Credits: 3
Studies impact of information network of wire and wireless communications and computers on political process in advanced industrial countries.

Prerequisites
60 credits or permission of instructor.

COMM 432 - Political Communication

Credits: 3
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.

COMM 434 - Interviewing
Credits: 3
Theory, principles, and practical skills essential to interview process. Emphasizes information gathering, journalistic, persuasive, employment, and performance-appraisal interviews.

Prerequisites
60 credits or permission of instructor

Hours of Lecture or Seminar per week
3

COMM 435 - Computers and Communication

Credits: 3
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.

Prerequisites
60 credits.

Hours of Lecture or Seminar per week
3

COMM 450 - Internship in Communication

Credits: 3
See department for procedures. 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.

Prerequisites
75 credits, major or minor in telecommunications or electronic journalism, 15 credits in COMM for majors, 12 credits for non-COMM majors, and permission of department

Notes
May be repeated up maximum 6 credits.

Hours of Lecture or Seminar per week
1

COMM 451 - Facilitating Communication Education
Credits: 3
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
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.

Prerequisites
COMM 303, 348, or 355.

Hours of Lecture or Seminar per week
1

Hours of Lab or Studio per week
0

COMM 454 - Free Speech and Ethics

Credits: 3
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.

Prerequisites
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
Cross-Listed with HIST 455

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.

Prerequisites
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
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.

Prerequisites
COMM 302 or permission of instructor.

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
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
Course may be repeated with department approval.

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
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.

Prerequisites
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
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.

Prerequisites
60 credits or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

COMM 499 - Independent Study in Communication

Credits: 3
Study of a selected area in communication. Independent study application must be processed before start of semester in which work is to take place.

Prerequisites
75 credits and permission of department.

Notes
May be repeated. 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
0

Hours of Lab or Studio per week
0

COMM 504 - Communication and Interpersonal Conflict

Credits: 3
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.

**COMM 506 - Communication in International Organizations**

Credits: 3
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.

**COMM 510 - Studies in Oral Interpretation**

Credits: 3
Examines role of oral communicator in selection, adaptation, and performance of literature.

**Notes**
Topics vary depending on genre being considered. May be repeated three times for credit if each course devoted to a different genre.

**COMM 530 - Theories of Small Group Communication**

Credits: 3
Advanced-level theory and practice of small group interaction. Examines current research, focusing on learning applications of theories to relevant settings.
COMM 542 - Directing Debate Activities

Credits: 3
Theory and practice of competitive debate. Emphasizes traditional and contemporary theories; administrative activities related to direction of a debate program; and methods of instruction, including analysis of current debate topic. Designed for novice and experienced debate coaches.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

COMM 551 - Developing Students' Speaking and Listening Skills

Credits: 3
Emphasizes development of assignments that develop communication competence in children and adolescents. Covers five communication functions and their development to integrate basic skills at elementary level and direct teaching at secondary level, and philosophies of communication education and curriculum development as well as competency assessment.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

COMM 554 - Telecommunications Policy and Regulation

Credits: 3
Reviews history and principles of telecommunications regulation. Studies relevant policy-making and regulatory institutions and their roles in charting U.S. telecommunications course. Examines role of citizens and lobby groups in regulatory process.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

COMM 590 - Seminar in Communication

Credits: 3
Intensive study of specific topics; content varies.

Notes
May be repeated for credit.

Hours of Lecture or Seminar per week
3
COMM 600 - Introduction to Graduate Studies

Credits: 3
This course offers a broad introduction to the field of communication in terms of communication-based theories and research.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

COMM 601 - Communication in Professional Relationships

Credits: 3
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
Explores theories that have guided development of mass media. Emphasizes major scientific and humanistic approaches to mass media effects.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

COMM 604 - Communication Research Practicum

Credits: 3
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.

Prerequisites
COMM 634 or permission of instructor
COMM 605 - Intercultural Communication

Credits: 3
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 620 - Health Communication

Credits: 3
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 621 - Media Advocacy for Nonprofit Organizations

Credits: 3
Drawing from scholarship in media studies, critical theory, and public health campaign literature, provides graduate-level introduction to media advocacy strategies for nonprofit organizations with limited financial resources.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

COMM 630 - Theories of Public Relations

Credits: 3
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.

**COMM 631 - Approaches to Group Facilitation**

Credits: 3
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
Analyzes contemporary theories, concepts, and approaches to improving interpersonal communication. Examines interpersonal communication research.

**Prerequisites**
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
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  
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  
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 650 - Research Methodologies in Communication**

Credits: 3  
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.

**Prerequisites**  
Graduate standing.

**Hours of Lecture or Seminar per week**  
3  
**Hours of Lab or Studio per week**  
0

**COMM 651 - Communication in the Classroom**

Credits: 3  
Communication theories and skills to manage communicative environment in classroom. Considers nonverbal aspects of space, time, action, and form as they affect teaching choices. Covers verbal patterns for skills of classroom management, including questioning skills, enhancement of students' self-concept, systematic feedback, parental communication, and student development.

**Hours of Lecture or Seminar per week**  
3
**COMM 653 - Graduate Communication: Research and Teaching**

Credits: 3
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**

Credits: 3
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.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**COMM 656 - Global Communication**

Credits: 3
Study of global telecommunication channels and artifacts of international mass communication, with focus on discussing problems of free flow of information, roles of nations and international organizations in fostering global communication, and other technologies. Develops perspectives on worldwide social, political, educational, and economic development.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**COMM 675 - Content Analysis**

Credits: 3
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 694 - Communication Internship

Credits: 3-6
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.

Prerequisites
18 graduate credits and permission of department.

COMM 696 - Directed Readings and Research

Credits: 1-3
Reading and research on specific topic under direction of faculty member. Written report required; oral or written exam may be required.

Prerequisites
Permission of department.

Notes
May be repeated for maximum 6 credits.

COMM 697 - Independent Production

Credits: 1-3
Media or creative production activities under direction of faculty member. Requires completed production; written report, oral exam may be required.

Prerequisites
Permission of department.

Notes
May be repeated for maximum 6 credits.

**COMM 705 - Intercultural Health and Risk Communication**

Credits: 3
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*
0
*Hours of Lab or Studio per week*
0

**COMM 706 - Strategic Communication**

Credits: 3
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.

**Prerequisites**
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
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  
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  
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  
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.

**Prerequisites**  
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  
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.

**Prerequisites**  
COMM 650.
COMM 798 - Communication Studies Project

Credits: 3
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.

COMM 799 - Master's Thesis

Credits: 1-6
Original research endeavor related to student's concentration in communication under supervision of faculty committee.

Prerequisites
24 graduate credits and approval of thesis proposal by faculty committee.

COMM 800 - Studies for the Doctor of Philosophy in Education

Credits: variable
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.

Prerequisites
Admission to doctoral program in communication.

Notes
May be repeated.

COMM 806 - International Public Relations
Credits: 3
Provides a survey of international public relations with an emphasis in three areas: applied knowledge for actual international practice, relevant theory, and ethical issues.

Prerequisites
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
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
Selected topics reflecting specialized areas in communication.

Prerequisites
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 896 - Independent Study

Credits: 3
Independent reading on a topic agreed on by student and faculty member.

Prerequisites
PhD rank or permission of instructor.
COMM 998 - Doctoral Dissertation Proposal

Credits: 1-6
Development of a research proposal that constitutes the basis for a doctoral dissertation.

Prerequisites
Advancement to candidacy.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0
Grading
S/NS

COMM 999 - Doctoral Dissertation Research

Credits: 1-15
Research on an approved dissertation topic under the direction of dissertation committee.

Prerequisites
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.

CONF 101 - Conflict and Our World

Credits: 3
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.
CONF 202 - Dialogue and Difference

Credits: 3
Communicating effectively across differences of age, gender, language, culture, and political orientation, and in different contextual situations is a skill useful for every individual. It is also integral to the success of any attempt to resolve conflict, whether individual, group/institutional, or global. Through this course, students will gain an understanding of the challenges of communicating across differences and the skills required to communicate effectively. Students will engage in preparing and analyzing communication strategies and over the term will participate in a dialogue group that explores the meaning and experience of difference on the Mason campus.

CONF 240 - Social Dynamics of Terrorism, Security, and Justice

Credits: 3
Terrorism is a significant factor in conflict worldwide, yet the underlying causes and conditions that give rise to terrorist activity are often misunderstood and misrepresented. Through case studies of terrorist groups around the world, students are presented with an analytic framework to account for terrorist acts and organizations. Explores the various social dynamics underlying the development of terrorism and responses to it. Topics include, but are not limited to, defining terrorism, recruitment into violent groups, dynamics of terrorist organizations, counter-terrorism and human rights concerns, the role of religious and political ideologies in terrorism and counter-terrorism, media coverage of terrorism, and effects of terrorism on social structures and processes.

CONF 300 - Conflict Resolution Techniques and Practice

Credits: 3
Advanced consideration of CONF 101 topics, introduction of core notion of reflective practice, conflict resolution techniques, practice, third party roles, and ethics.

Prerequisites
CONF 101 or permission of instructor

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0
CONF 301 - Research and Inquiry in Conflict Resolution

Credits: 3
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.

Prerequisites
CONF 101 or permission of instructor

CONF 302 - Identity Conflicts and their Resolution

Credits: 3
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.

CONF 320 - Interpersonal Conflict Analysis and Resolution

Credits: 3
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.

CONF 330 - Community, Group, and Organizational Conflict Analysis and Resolution
Credits: 3
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.

Hours of Lecture or Seminar per week
3

CONF 340 - Global Conflict Analysis and Resolution

Credits: 3
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.

Hours of Lecture or Seminar per week
3

CONF 341 - Global Conflict Resolution Practice

Credits: 1
Building upon CONF340 theories and concepts, this course 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.

Prerequisites/Corequisites
CONF 340

Hours of Lecture or Seminar per week
3

CONF 375 - Special Programs Field Experience

Credits: 1-6
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.

Prerequisites
Permission of instructor and director, controlled enrollment form required.
CONF 385 - International Field Experience

Credits: 3
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.

Prerequisites
CONF 101, and permission of instructor

Notes
May be repeated for up to 6 credits.

CONF 393 - Philosophy, Conflict Theory, and Violence

Credits: 3
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.

Prerequisites
CONF 101 or permission of instructor

CONF 399 - Special Topics in Conflict Analysis and Resolution

Credits: 3
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.
CONF 490 - Integration

Credits: 3
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.

Prerequisites
CONF 101 and degree status; or permission of instructor

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

CONF 495 - Organizations and Actors in the Conflict Field

Credits: 3
This seminar acquaints students with the work of professionals in the conflict field through lectures, guest speakers, and field trips to organizations and institutions located in the region. Topics will vary and may include the role and structure of nongovernmental organizations engaged in conflict resolution, the ethical challenges facing conflict practitioners, and the translation of theoretical concepts into practical action.

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: 1-3
Readings and research conducted on individual basis in consultation with instructor.

Prerequisites
CONF 101 and permission of instructor

Notes
Student may not present more than 3 credits for graduation credit.
CONF 501 - Introduction to Conflict Analysis and Resolution

Credits: 3
*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.

**Prerequisites/Corequisites**
Prerequisite or corequisite for all MS CONF majors

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

CONF 502 - Intensive Introduction to Conflict Analysis and Resolution

Credits: 3
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.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

CONF 595 - Selected Topics

Credits: 3
Topics vary each semester and are announced each academic year.

**Prerequisites**
CONF 501

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

CONF 601 - Theories of Conflict and Conflict Resolution
Credits: 3
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.

**Prerequisites**
CONF 501 or 801

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

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**CONF 610 - Philosophy and Methods of Conflict Research**

Credits: 3
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.

**Prerequisites**
CONF 501 or 801

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

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**CONF 611 - MS Research II**

Credits: 3
Guides students through design, execution, interpretation, analysis, presentation, and evaluation of field research in conflict and resolution.

**Prerequisites**
CONF 501 and 610

**Notes**
Builds on CONF 610.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

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**CONF 642 - Integration of Theory and Practice**
Credits: 3
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.

Prerequisites/Corequisites
Prerequisite or corequisite: CONF 501, 601, 610, and 713

Hours of Lecture or Seminar per week
3

CONF 650 - Conflict Analysis and Resolution Advanced Skills

Credits: 3
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.

Prerequisites/Corequisites
Prerequisite or corequisite: CONF 501 or 502

Hours of Lecture or Seminar per week
3

CONF 651 - Conflict Analysis and Resolution for Collaborative Leadership in Community Planning

Credits: 3
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.

Prerequisites/Corequisites
Prerequisite or corequisite: CONF 501 or 502

Hours of Lecture or Seminar per week
3

CONF 652 - Conflict Analysis and Resolution for Prevention, Reconstruction, and Stabilization Contexts
Credits: 3
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.

**Prerequisites/Corequisites**
Prerequisite or corequisite: CONF 501 or 502

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**CONF 653 - World Religions, Diplomacy, and Conflict Resolution**

Credits: 3
Analyzes ways world religions play role in conflicts, war, diplomacy, peace making, and conflict resolution.

**Prerequisites/Corequisites**
Prerequisite or corequisite: CONF 501 or 502

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**CONF 656 - Integrating Complementary Approaches in Conflict Analysis and Resolution**

Credits: 3
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.

**Prerequisites/Corequisites**
Prerequisite or corequisite: 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
Covers range of skills in group facilitation processes, with emphasis on conflict analysis and resolution approaches to improve group communication. Includes skill-building exercises.

**Prerequisites/Corequisites**
Prerequisite or corequisite: CONF 501 or 502
CONF 658 - Diversity and Difference in Conflict Analysis and Resolution

Credits: 3
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.

Prerequisites/Corequisites
Prerequisite or corequisite: CONF 501 or 502

CONF 659 - Leadership in Conflict Analysis and Resolution

Credits: 3
Covers roles and styles of leadership in interpersonal, organizational, community, group, and international conflicts. Considers cultural roles of leaders as insider-partials, negotiators, facilitators, and mediators.

Prerequisites/Corequisites
Prerequisite or corequisite: CONF 501 or 502

CONF 660 - Conflict Assessment and Program Evaluation

Credits: 3
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.

Prerequisites/Corequisites
Prerequisite or corequisite: CONF 501 or 502
CONF 665 - Special Topics in Conflict Analysis and Resolution

Credits: 3
In-depth study of contemporary areas of conflict resolution practice. Fulfills elective requirement for certificate program. Topics vary.

Prerequisites/Corequisites
CONF 502 or permission of the instructor

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

CONF 668 - Applied Integration for Graduate Certificates

Credits: 3
Capstone course facilitating integration of learning in the graduate certificate programs, and appropriate mentored application and experiential learning.

Prerequisites
CONF 501 or 502; CONF 660; and CONF 650,651,652 or 653

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

CONF 682 - Principles of Environmental Conflict Resolution

Credits: 3
Cross-Listed with EVPP 682

This course 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.

Prerequisites
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
Cross-Listed with EVPP 683

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.

Prerequisites
CONF 682/EVPP 682 or permission of instructor

Hours of Lecture or Seminar per week
3

CONF 684 - Environmental Conflict Resolution and Collaboration: Leadership Practicum/Capstone

Credits: 3
Cross-Listed with EVPP 684

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.

Prerequisites
CONF 682/EVPP 682, CONF 683/EVPP 683

Hours of Lecture or Seminar per week
3

CONF 690 - Practicum in Conflict Analysis and Resolution

Credits: 6
In-depth field study of ongoing conflict situations, and design and delivery of intervention processes to manage or resolve conflicts.

Prerequisites
CONF 501 or 801, and 713

Notes
Two semesters, 3 credits per semester.

Hours of Lecture or Seminar per week
1
CONF 694 - Internship

Credits: 1-6
Students are expected to mesh theory and practice through observation and experience. Includes comprehensive report analyzing experiences.

Prerequisites
21 credits, including CONF 713

Notes
Under direction of internship coordinator, students spend at least 160 hours on project involving study, resolution of conflict for each 3-credit internship.

CONF 695 - Selected Topics

Credits: 3
Topics vary; they are announced each academic year.

CONF 697 - Directed Reading

Credits: 1-3
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.
CONF 701 - Theories of Social Harmony

Credits: 3
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.

Prerequisites
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
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.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

CONF 703 - Conceptions of Practice

Credits: 3
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.

Prerequisites
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: 3
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
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 deeprooted conflicts.

Prerequisites
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
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 713 - Reflective Practice in Interpersonal-Multiparty Conflicts

Credits: 3
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.

**Prerequisites/Corequisites**
Prerequisite or corequisite for all CONF majors: CONF 501 or 801

**CONF 714 - Reflective Practice in Organizational or Community Conflict**

Credits: 3
Moves from conflicts that are simply described to those with multilevel components, such as community and organizational conflicts. Expands skills acquired in CONF 713 by adding recording chronology, identifying roles played by various participants, observing turning points in process, and precisely stating agreed-on solution.

**Prerequisites**
CONF 501 or 801 and 713

**CONF 715 - Reflective Practice in International Conflict and Civil Strife**

Credits: 3
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.

**Prerequisites**
CONF 501, 713, and 714

**CONF 720 - Ethnic and Cultural Factors in Conflict Resolution**

Credits: 3
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.
Prerequisites
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
Cross-Listed with SOCI 523

Addresses historic analyses of racial and ethnic identity conflicts and their resolution.

Prerequisites
CONF 501 or 801

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

CONF 722 - Conflict and Religion

Credits: 3
Explores role of religious ideas, practices, and organizations in conflict, war, peace making, and conflict resolution.

Prerequisites
CONF 501 or 801

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

CONF 723 - Conflict and Gender

Credits: 3
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.

Prerequisites
CONF 501 or 801

Hours of Lecture or Seminar per week

CONF 726 - Moral and Philosophical Foundations of Conflict

Credits: 3
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.

Prerequisites
CONF 501 or 801

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

CONF 727 - Cross-Cultural Analysis of Conflict

Credits: 3
Introduces techniques of participant observation and anthropological research. Provides insights into cross-cultural fieldwork experience, an important skill to facilitate working with groups outside one's "worldview." Highly recommended for students interested in understanding diverse groups and gaining insights into worldviews and values held by different people.

Prerequisites
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
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.

Prerequisites
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
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.

Prerequisites
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
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.

Prerequisites
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
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.

Prerequisites
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
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.

Prerequisites
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: 3
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.

Prerequisites
CONF 501 or 801

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

CONF 735 - Global Context of Conflict

Credits: 3
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.

Prerequisites
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
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.

Prerequisites
CONF 501 or 801

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

CONF 738 - Researching Conflict in Health Systems

Credits: 3
Capstone seminar; final course in graduate certificate program in conflict resolution for health professionals. Involves conducting research and analyzing specific conflict situation in depth. Builds on theory, research, and practice learned in previous courses for this certificate.

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
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.

Prerequisites
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

Credits: 3
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.

Prerequisites
CONF 501 or 801, 713
CONF 741 - Negotiations

Credits: 3
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.

Prerequisites
CONF 501 or 801

CONF 743 - Dynamics of Conflict Termination

Credits: 3
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.

Prerequisites
CONF 501 or 801

CONF 745 - Leadership Roles in Conflict and Conflict Resolution

Credits: 3
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.

Prerequisites
CONF 501 or 801
CONF 746 - Peace Building

Credits: 3
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.

Prerequisites
CONF 501 or 801

Hours of Lecture or Seminar per week
3

CONF 747 - Reconciliation

Credits: 3
Explores processes of acknowledgment, reconciliation, forgiveness, and restitution. Reviews literature, case studies, and other research to assess applicability and impact of these efforts.

Prerequisites
CONF 501 or 801

Hours of Lecture or Seminar per week
3

CONF 748 - Comparative Peace Processes

Credits: 3
Compares case studies drawn from actual peace processes, both successful and unsuccessful, to illuminate principles and complexities.

Prerequisites
CONF 501 or 801, and 601 or 803

Hours of Lecture or Seminar per week
3
CONF 749 - World Religions, Violence, and Conflict Resolution

Credits: 3
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.

Prerequisites
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
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.

Prerequisites
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: 1-3
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.

Prerequisites
CONF 501 or 801

Notes
May be repeated.

Hours of Lecture or Seminar per week
1-3

Hours of Lab or Studio per week
0
CONF 798 - Thesis Proposal

Credits: 1
Covers development of research proposal for master's thesis, including framing a question and literature review, and designing appropriate methodology. Students form master's thesis committee and review Human Subject Review Board's guidelines and procedures.

Prerequisites
CONF 501 and 610

Hours of Lecture or Seminar per week
0

Hours of Lab or Studio per week
0

CONF 799 - Master's Thesis

Credits: 1-6
Two semesters, usually taken as 3 credits per semester. Original research or analysis under direction of thesis committee.

Prerequisites
CONF 501, 713, 610

Hours of Lecture or Seminar per week
0

Hours of Lab or Studio per week
1-6

CONF 801 - Introduction to Conflict Analysis and Resolution

Credits: 3
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.

Prerequisites/Corequisites
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
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.

Prerequisites/Corequisites
Prerequisites or corequisite: CONF 801

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

CONF 803 - Structural Theories

Credits: 3
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.

Prerequisites
CONF 801

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

CONF 810 - Philosophy and Conflict Research

Credits: 3
Philosophy of knowledge acquisition. Assumes close link between ways we think and ways we build and test theories about the world. Explores and critiques thinking of major 20th-century thinkers from the social sciences, thus forming a critical framework for working with multiple research methodologies.

Prerequisites
CONF 801

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

CONF 811 - Advanced Quantitative Research Methods
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.

**Prerequisites**
CONF 711, 801, and 810

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**CONF 812 - Advanced Qualitative Research Methods**

Credits: 3
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.

**Prerequisites**
CONF 801 and 810

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**CONF 890 - Practicum in Conflict Analysis and Resolution**

Credits: 6
In-depth field study of ongoing conflict situations. Design and delivery of intervention processes to manage or resolve conflicts.

**Prerequisites**
CONF 801 and 713; two semesters.

**Hours of Lecture or Seminar per week**
1

**Hours of Lab or Studio per week**
5

**CONF 897 - Directed Reading**

Credits: 3
Independent reading at doctoral level on a specific topic related to conflict and conflict resolution as agreed to by student and faculty member.

**Hours of Lecture or Seminar per week**
3
CONF 900 - Integrating Theory, Practice, and Method in Conflict Analysis

Credits: 3
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.

Prerequisites
CONF 801 and 802, and at least 9 additional credits of required doctoral courses

CONF 998 - Doctoral Dissertation Proposal

Credits: 1-6
Work on research proposal that forms basis for doctoral dissertation.

Prerequisites
Successful completion of all course work and doctoral qualifying exams

Notes
May be repeated.

CONF 999 - Doctoral Dissertation Research

Credits: 1-12
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.
CONS 320 - Conservation in Practice

Credits: 3
Active communication and presentation techniques essential to conservation practitioners. Explores conservation issues from interdisciplinary perspectives.

Notes
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 Science I: Conservation Theory

Credits: 3
Introduces the field of conservation biology and science-based management of threatened wildlife and habitats. Provides theoretical background for understanding the importance of biodiversity conservation and climate change and its potential impacts on conservation.

Notes
Only offered through the Smithsonian Mason Semester.

Hours of Lecture or Seminar per week
2

Hours of Lab or Studio per week
1

CONS 402 - Conservation Science II: Conservation Practice

Credits: 4
An applied scientific approach to the nature of biodiversity and impacts of biodiversity loss. Covers reproductive physiology, semen collection and preservation, and non-invasive endocrine monitoring.

Notes
Only offered through the Smithsonian Mason Semester.

Hours of Lecture or Seminar per week
2

Hours of Lab or Studio per week
2

CONS 410 - Human Dimensions in Conservation
Credits: 3
Presents essential sociological and societal perspectives on conservation issues including human wildlife interactions, environmental economics, public policy, environmental values and public opinion, ecological grief, community-based conflict resolution, and conservation ethics.

Notes
Only offered through the Smithsonian Mason Semester.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**CONS 420 - Human-Wildlife Conflict**

Credits: 3
Covers the impact of human-wildlife conflict on conservation efforts and human health and well being.

Notes
Only offered through the Smithsonian Mason Semester.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**CONS 490 - Integrated Conservation Strategies**

Credits: 3
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.

Notes
Only offered through the Smithsonian Mason Semester.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**CS 101 - Preview of Computer Science**

Credits: 2
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
CS 112. 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

CS 105 - Computer Ethics and Society

Credits: 1
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.

Prerequisites
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
This course 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.

Prerequisites
Satisfaction of prerequisites for MATH 113.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
1

CS 123 - Computing: From the Abacus to the Web

Credits: 3
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.

Prerequisites
None
Notes
Students may not take this course for credit once they have successfully completed CS 211. Intended for nonmajors.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

CS 211 - Object-Oriented Programming

Credits: 3
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.

Prerequisites
Grade of C or better in CS 112.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
1

CS 222 - Computer Programming for Engineers

Credits: 3
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. (Intended as terminal course in computer programming.)

Prerequisites
Grade of C or better in CS 112.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

CS 225 - Culture and Theory of Games

Credits: 3
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
Advanced programming using Java programming language. Other languages may be offered at times.

Prerequisites
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
Introduction to the language C, as well as operating system concepts, in UNIX, to prepare students for topics in systems programming.

Prerequisites
Grade of C or better in CS 211 or CS 222.

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
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.

Prerequisites
CS 105, junior standing (at least 60 credit hours)

Corequisite
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
This course continues to focus 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.

Prerequisites
Grade of C or better in CS 211.

Corequisite
CS105.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

CS 325 - Introduction to Game Design

Credits: 3
Game design, in various electronic entertainment technologies, involves a diverse set of skills and backgrounds from narrative and art to computer programming. This course surveys the technical aspects of the field, with an emphasis on programming.

Prerequisites
Grade of C or better in CS 211.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

CS 330 - Formal Methods and Models

Credits: 3
Abstract concepts that underlie much advanced work in computer science, with major emphasis on formal languages, models of computation, logic, and proof strategies.

Prerequisites
Grade of C or better in CS 211 and MATH 125.
CS 332 - Object-Oriented Software Design and Implementation

Credits: 3
Cross-Listed with SWE 332

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.

Prerequisites
Grade of C or better in CS 211.

CS 363 - Comparative Programming Languages

Credits: 3

Key programming mechanisms described independently of particular machines or languages including control, binding, procedural abstraction, and types. Systematically surveys diverse high-level language capabilities.

Prerequisites
Grade of C or better in CS 262.

CS 367 - Computer Systems and Programming

Credits: 3

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.
Prerequisites
Grade of C or better in CS 262 or 222 and ECE 301 or 331.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

CS 391 - Advanced Programming Lab

Credits: 1
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
Grade of C or better in CS 310 and permission of instructor.

Hours of Lecture or Seminar per week
0

Hours of Lab or Studio per week
1

CS 421 - Software Requirements and Design Modeling

Credits: 3
Cross-Listed with SWE 421

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.

Prerequisites
Grade of C or better in CS 211.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

CS 425 - Game Programming I

Credits: 3
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.

**Prerequisites**
Grade of C or better in CS 325 and 367.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

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**CS 426 - Game Programming II**

Credits: 3
This project-oriented course is a continuation of CS 425 with an emphasis on the implementation of a complete game.

**Prerequisites**
CS 425.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

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**CS 440 - Language Processors and Programming Environments**

Credits: 3
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.

**Prerequisites**
Grade of C or better in CS 310, 330, and 367.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

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**CS 450 - Database Concepts**

Credits: 3
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.
Prerequisites
Grade of C or better in CS 310 and 330.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

CS 451 - Computer Graphics

Credits: 3
Basic graphics principles and programming. Topics include scan conversion, transformation, viewing, lighting, blending, texture mapping, and some advanced graphics techniques.

Prerequisites
Grade of C or better in MATH 203, CS 310, and CS 367.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

CS 455 - Computer Communications and Networking

Credits: 3
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.

Prerequisites
Grade of C or better in CS 310 and 367, and STAT 344.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

CS 465 - Computer Systems Architecture

Credits: 3
Computer subsystems and instruction set architectures. Single-cycle, multiple-cycle, and pipeline architectures. Memory hierarchy, cache, and virtual memory input-output processing.

Prerequisites
Grade of C or better in CS 367.
Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

**CS 468 - Secure Programming and Systems**

Credits: 3
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.

Prerequisites
Grade of C or better in CS 310 and CS 367.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

**CS 471 - Operating Systems**

Credits: 3
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.

Prerequisites
Grade of C or better in CS 310 and 367.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

**CS 475 - Concurrent and Distributed Systems**

Credits: 3
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.

Prerequisites
Grade of C or better in CS 310 and 367.

Hours of Lecture or Seminar per week
CS 480 - Introduction to Artificial Intelligence

Credits: 3
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.

Prerequisites
Grade of C or better in CS 310 and 330.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

CS 482 - Computer Vision

Credits: 3
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.

Prerequisites
Grade of C or better in CS 319, MATH 203 and STAT 344

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

CS 483 - Analysis of Algorithms

Credits: 3
Analyzes computational resources for important problem types by alternative algorithms and their associated data structures, using mathematically rigorous techniques. Specific algorithms analyzed and improved.

Prerequisites
Grade of C or better in CS 310, CS 330 and MATH 125.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0
CS 484 - Data Mining

Credits: 3
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.

Prerequisites
Grade of C or better in CS 310 and STAT 344.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

CS 485 - Autonomous Robotics

Credits: 3
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.

Prerequisites
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
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.

Prerequisites
Grade of C or better in CS 421, 483; two other CS 400-level courses; and senior standing.

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
Research and analysis of selected problems or topics in computer science. Topic must be arranged with instructor and approved by department chair before registering.

Prerequisites
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
0
Hours of Lab or Studio per week
0

CS 499 - Special Topics in Computer Science

Credits: 3
Topics of special interest to undergraduates.

Prerequisites
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
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.

Prerequisites
MATH 125; and CS 310, 330, and 365

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0
**CS 555 - Computer Communications and Networking**

Credits: 3  
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.

**Prerequisites**  
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  
Models of operating systems. Major functions including processes, memory management, I/O, interprocess communication, files, directories, shells, distributed systems, performance, and user interface.

**Prerequisites**  
CS 310 and CS 465.

**Hours of Lecture or Seminar per week**  
3

**Hours of Lab or Studio per week**  
0

**CS 580 - Introduction to Artificial Intelligence**

Credits: 3  
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.

**Prerequisites**  
CS 310 and 330.

**Hours of Lecture or Seminar per week**  
3

**Hours of Lab or Studio per week**  
0

**CS 583 - Analysis of Algorithms**
Credits: 3
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.

Prerequisites
CS 310 and 330, and MATH 125.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

CS 600 - Theory of Computation

Credits: 3
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.

Prerequisites
CS 583 and discrete mathematics.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

CS 631 - Object-Oriented Design Patterns

Credits: 3
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.

Prerequisites
SWE 619 or 620, 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

CS 633 - Computational Geometry

Credits: 3
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.

**Prerequisites**
CS 583

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

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**CS 635 - Foundations of Parallel Computation**

Credits: 3
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.

**Prerequisites**
CS 583, and 540 or 571; or equivalent.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

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**CS 640 - Advanced Compilers**

Credits: 3
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.

**Prerequisites**
CS 540 and 583, or equivalent

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

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**CS 645 - Programming Language Semantics**

Credits: 3
This course introduces basic concepts and techniques in the foundational study of programming languages. The central theme is the view of individual programs and whole languages as mathematical objects about which precise claims may be made and proved. Particular topics include operational techniques for formal definition of language features, type systems and type safety properties, polymorphism and subtyping, and foundations of object-oriented programming.
Prerequisites
CS 540, language processors.

Hours of Lecture or Seminar per week
0

Hours of Lab or Studio per week
0

CS 650 - Database Engineering

Credits: 3
Data models for network, hierarchical, object-oriented, and relational management information systems. Covers development (including internal structures) of a database system.

Prerequisites
CS 540, 571 and 583

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

CS 652 - Computer Graphics

Credits: 3
Graphics principles and programming. Topics include graphics hardware, antialiasing, transformations, viewing, illumination, blending, texture mapping, color models, curves, surfaces, and animation.

Prerequisites
CS 583.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

CS 658 - Networked Virtual Environments

Credits: 3
Cross-Listed with IT 658

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.

**Prerequisites**

CS 555

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**CS 662 - Computer Graphics Game Technologies**

Credits: 4

Addresses some graphics game techniques including collision detection, levels of detail, physics-based simulations, textures, maps, and shadows.

**Prerequisites**

CS 652. Topics include modeling, rendering, and simulation in real time.

**Hours of Lecture or Seminar per week**

3

**Hours of Lab or Studio per week**

1

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**CS 667 - Biometrics**

Credits: 3

**Cross-Listed with** IT 667

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.

**Prerequisites**

CS 580 or permission of the instructor.

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**CS 668 - Computer Architecture Systems**

Credits: 3

Examines principles and practices relating computer architecture to programming execution and efficiency. Presents new approach that stresses performance and cost of architecture. Examines principles of compiler and OS implications, instructions sets, basic processors, pipelines, and memory-hierarchy. Topics may include RISC machines, cache memories, register usage, and vector machines.

**Prerequisites**

CS 540 or 571, or equivalent.

**Hours of Lecture or Seminar per week**

3
CS 671 - Advanced Operating Systems

Credits: 3
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.

Prerequisites
CS 571, or permission of instructor

CS 672 - Computer System Performance Evaluation

Credits: 3
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.

Prerequisites
CS 571 and MATH 351, or permission of instructor

CS 673 - Multimedia Computing and Systems

Credits: 3
Focuses on technological and development environments in developing multimedia applications. Projects involve experience with multimedia authoring tools and simulations to assess performance.

Prerequisites
CS 571.
CS 675 - Distributed Systems

Credits: 3
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.

Prerequisites
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
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.

Prerequisites
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
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.

Prerequisites
CS 580.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0
**CS 682 - Computer Vision**

Credits: 3  
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.

**Prerequisites**  
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  
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.

**Prerequisites**  
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  
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.

**Prerequisites**  
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
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.

Prerequisites
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
Concepts and techniques in image processing. Discusses methods for image capture, transformation, enhancement, restoration, and encoding. Students complete projects involving naturally occurring images.

Prerequisites
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
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.

Prerequisites
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
Cross-Listed with IT 688

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.

Prerequisites
CS 580 or equivalent.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

CS 695 - Topics in Computer Science

Credits: 3
Special topics in computer science not occurring in regular computer science sequence.

Prerequisites
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

CS 697 - Independent Reading and Research

Credits: 1-3
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.

Prerequisites
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
0
Hours of Lab or Studio per week
0
CS 700 - Quantitative Methods and Experimental Design in Computer Science

Credits: 3
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.

Prerequisites
STAT 344, at least two 600-level courses in computer science, and doctoral status.

Hours of Lecture or Seminar per week
0

Hours of Lab or Studio per week
0

CS 706 - Concurrent Software Systems

Credits: 3
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.

Prerequisites
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
Cross-Listed with IT 809

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.

Prerequisites
At least one operating system and one networking course, and admission to VSITE doctoral program.

Notes
Term paper and project required.

Hours of Lecture or Seminar per week
3
CS 732 - Software Maintenance and Reuse

Credits: 3
Cross-Listed with IT 822

Perfective maintenance, reuse of software components and patterns, evolving software systems, principles of object-oriented analysis and development. Presents issues regarding technologies supporting perfective software maintenance and reuse.

Prerequisites
CS/SWE 621 or equivalent, data structures, principles of modern programming, and discrete mathematics; or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

CS 735 - Concurrency

Credits: 3

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.

Prerequisites
CS 635 or 706, or equivalent.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

CS 750 - Theory and Applications of Data Mining

Credits: 3
Cross-Listed with IT 750

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.

Prerequisites
CS 688 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 752 - Interactive Graphics Software

Credits: 3
Advanced graphics methods and tools. Topics include visualization, modeling, rendering, animation, simulation, virtual reality, graphics software tools, and current research topics.

Prerequisites
CS 652.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

CS 753 - Parallel Computation

Credits: 3
Cross-Listed with IT 815

Covers topics illustrating contemporary thinking on architectures, application, development environments, algorithms, operating systems, language requirements, and performance.

Prerequisites
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
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.

Prerequisites
CS 555.
CS 756 - Performance Analysis of Computer Networks

Credits: 3
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.

Prerequisites
CS 555.

CS 771 - Neural Networks

Credits: 3
Cross-Listed with IT 817

Studies adaptive and competitive principles using distributed and parallel computation. Topics include background from statistics, control, adaptive signal processing, and neurosciences. Basic models, such as those suggested by Grossberg, Hopfield, and Kohonen, discussed in terms of analytical characteristics and applications. Neural networks assessed as universal approximators. Connections to fuzzy approach established through the Radial Basis Function approach. Presents applications to perception, knowledge-based systems, and robotics.

Prerequisites
CS 688, or permission of instructor.

CS 773 - Real-Time Systems Design and Development

Credits: 3
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.
Prerequisites
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
Cross-Listed with IT 835

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.

Prerequisites
CS 68 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
Cross-Listed with IT 844

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.

Prerequisites
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
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).

**Prerequisites**
CS 652 or IT 875.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

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**CS 777 - Human-Computer Intelligent Interaction**

Credits: 3

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.

**Prerequisites**
CS 580, and 652 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

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**CS 780 - Data Mining in Multimedia Databases**

Credits: 3

**Cross-Listed with** INFS 780

This course covers advanced algorithms for data management, learning, and mining large multimedia databases. Issues related to handling such data including feature selection, high dimensional indexing, interactive search and information retrieval, pattern discovery, and scalability to large datasets are discussed. Mining techniques and data types to be covered include texts/web, images, videos, DNA, temporal, spatial, spatiotemporal databases, graph mining, stream mining, and data visualization.

**Prerequisites**
INFS 755 or CS 750 or permission of instructor.

**Hours of Lecture or Seminar per week**
3
CS 782 - Machine Learning

Credits: 3
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.

Prerequisites
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

CS 785 - Knowledge Acquisition and Problem Solving

Credits: 3
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.

Prerequisites
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

CS 795 - Advanced Topics in CS

Credits: 3
Advanced topics not occurring in regular sequence.

Prerequisites
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
Master's degree candidates undertake a project using knowledge gained in MS program.

Prerequisites
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: 3-6
Original or expository work evaluated by committee of three faculty members.

Prerequisites
18 credits applicable toward MS in computer science.

CS 800 - Computer Science Colloquium

Credits: 1
Students are required to attend colloquia including talks by distinguished speakers, faculty candidates, and Mason faculty.

Prerequisites
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.
Grading
Students will receive a grade of satisfactory (S) or no credit (NC).

CS 803 - Doctoral Tutorial in Information Technology

Credits: 3
Individualized intensive study of information technology.

Notes
May be repeated as needed.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

CS 804 - Doctoral Tutorial in Information Technology

Credits: 3
Individualized intensive study of information technology.

Notes
May be repeated as needed.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

CS 811 - Research Topics in Machine Learning and Inference

Credits: 3
Cross-Listed with IT 811

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.

Prerequisites
CS 580 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
Cross-Listed with IT 818

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.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

CS 850 - Research Topics in Parallel Computation

Credits: 3
Cross-Listed with IT 915

Discusses current research topics that vary according to student and faculty interest. Possible topics include formal models of concurrency, specification and design of parallel programming languages, logic programming in a parallel environment, and parallel distributed processing (neural networks).

Prerequisites
CS 815.

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
Cross-Listed with IT 910

Special topics in artificial intelligence not occurring in regular computer science sequence.

Prerequisites
Graduate course in artificial intelligence.

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
CS 884 - Advanced Topics in Computer Vision and Robotics

Credits: 3
Cross-Listed with IT 940

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.

Prerequisites
CS 682 or 685, or permission of instructor depending on topics offered.

Notes
Course may be repeated with change of topic.

CS 895 - Research Topics in CS

Credits: 3
Advanced topics not occurring in regular sequence.

Prerequisites
Admission into computer science PhD program, or permission of instructor.

Notes
May be repeated for credit when subject differs. Only one such course should be used for breadth requirements.

CS 990 - Dissertation Topic Presentation

Credits: 1
Cross-Listed with IT 990

Students put together a professional presentation of a research proposal and present it for critique to fellow students and interested faculty.
Prerequisites
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.

CS 998 - Doctoral Dissertation Proposal

Credits: 1-12
Work on research proposal that forms basis for doctoral dissertation.

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

CS 999 - Doctoral Dissertation

Credits: 1-12
Formal record of commitment to doctoral dissertation research under direction of faculty member in computer science.

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

CSI 501 - Introduction to Scientific Programming

Credits: 3
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.

Prerequisites
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
Cross-Listed with SYST 500

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.

Prerequisites
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 601 - Computational Science Tools I

Credits: 1
Introduces basic tools in computational science. Covers UNIX, editors, LaTeX, HTML, and graphics. Emphasizes application and use rather than theory. Substantial portion of instruction delivered via distance-learning web interface.

Prerequisites
Year of college calculus, and course in computer programming.

Notes
Not applicable to 48-credit course total for CSI PhD.

Hours of Lecture or Seminar per week
1
Hours of Lab or Studio per week
0

CSI 602 - Computational Science Tools II

Credits: 1
Covers MATLAB, MAPLE, and GNUPlot. Emphasizes application and use rather than theory. Substantial portion of instruction delivered via distance-learning web interface.

Prerequisites
CSI 601, and knowledge of matrix algebra. Introduces basic tools in computational science.

Notes
Not applicable to 48-credit course total for CSI PhD.
CSI 606 - Scientific Graphics and Visualization Tools

Credits: 1
Introduces use of scientific visualization tools for data analysis. Teaches use of specific packages on rotating basis. Packages include PV-WAVE, S-Plus, SV, XMGR, and pnm tools.

Prerequisites
CSI 601, or permission of instructor.

Notes
Not applicable to 48-credit course total for CSI PhD.

CSI 607 - Database Tools for Scientists

Credits: 1
Covers relational model used in Oracle and other database packages. Includes database design concepts, table operations, triggers, sequences, and introduction to structured query language (SQL).

Prerequisites
CSI 601 and 602, or permission of instructor. Introduces database tools.

Notes
Not applicable to 48-credit course total for CSI PhD.

CSI 610 - Introduction to Computational Sciences

Credits: 3
Covers advanced numerical methods, computer architecture, and scientific software development. Includes software design, construction, and validation techniques commonly used in industry. Also introduces high-performance computing.

Prerequisites
CSI 601, 602, 603, 604, 605, and 700; or permission of instructor.

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
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.

Prerequisites
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 632 - Global Ecology**

Credits: 3
Intensive review to begin research in global change. Covers basic principles of physiological ecology; population dynamics; dynamics of ecological communities and ecosystems; biogeography; biological diversity; and dynamics of biosphere, including effects of life on atmosphere, oceans, and solid surfaces.

Prerequisites
General chemistry, general physics, introductory statistics, and calculus.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

**CSI 638 - The Policy Process for Scientists**

Credits: 3
Introduces relationship among government, science, scientists, and issues and processes that shape science policy. Emphasizes examples taken from space weather and meteorology.

Prerequisites
Graduate standing.

**CSI 639 - Ethics in Scientific Research**

Credits: 3
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.

**CSI 654 - Data and Data Systems in the Physical Sciences**

Credits: 3
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.

**Prerequisites**
Competency in programming at CSI 601-607 level, or permission of instructor.

**CSI 655 - Atmospheric Physics I**

Credits: 3
**Cross-Listed with** PHYS 575

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.

**Prerequisites**
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
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.

**Prerequisites**
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
**Cross-Listed with** ASTR 535

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.

**Prerequisites**
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 - Astrophysics**

Credits: 3
**Cross-Listed with** ASTR 530

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.
Prerequisites
PHYS 303, 305, 308; MATH 214.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

CSI 662 - Space Weather

Credits: 3
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.

Prerequisites
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
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.

Prerequisites
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
Cross-Listed with STAT 652

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.
CSI 674 - Bayesian Inference and Decision Theory

Credits: 3

Cross-Listed with STAT 664/SYST 664

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.

Prerequisites
STAT 544 or CSI 672, or equivalent.

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

Cross-Listed with STAT 658

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.

Prerequisites
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
Covers fundamental concepts, methods, and applications of materials science; structure of modern materials such as metallic alloys and compounds, ceramic materials, semiconductors, polymers, and nanostructured materials; materials properties including mechanical, thermal, and electric; experimental methods of materials characterization; application of computers in materials science; and elements of materials design.

Prerequisites
Undergraduate degree in physics, chemistry, materials, electrical or mechanical engineering, or related sciences; or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

CSI 687 - Solid State Physics and Applications

Credits: 3
Cross-Listed with PHYS 512
Covers crystal structures, binding, lattice vibrations, free electron model, metals, semiconductors and semiconductor devices, superconductivity, and magnetism.

Prerequisites
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
Cross-Listed with MATH 685/OR 682
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.

Prerequisites
MATH 203 and 214, and some programming experience.

Hours of Lecture or Seminar per week
3
CSI 701 - Foundations of Computational Science

Credits: 3
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.

Prerequisites
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
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.

Prerequisites
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
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.

Prerequisites
STAT 554 or CS 652, or permission of instructor.
CSI 709 - Topics in Computational Sciences and Informatics

Credits: 3
Covers selected topics in computational sciences and informatics not covered in fixed-content computational sciences and informatics courses.

Prerequisites
Admission to PhD program, and permission of instructor.

Notes
May be repeated for credit as needed.

CSI 710 - Scientific Databases

Credits: 3
Cross-Listed with IT 864

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.

Prerequisites
INFS 614 or equivalent, or permission of instructor.

CSI 711 - Chemical Thermodynamics and Kinetics

Credits: 3
Cross-Listed with CHEM 633

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.
Prerequisites
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
Cross-Listed with CHEM 728

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.

Prerequisites
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
Cross-Listed with CHEM 732

Illustrates fundamental concepts of quantum mechanics with applications to chemical systems, including atomic and molecular electronic structure and properties, molecular symmetry, and intermolecular forces.

Prerequisites
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
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.
CSI 715 - Quantum Complexity Theory

Credits: 3
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.

Prerequisites
CSI 615 or equivalent, or permission of instructor.

CSI 716 - Quantum Information Theory

Credits: 3
Introduces quantum information theory and its practical applications to information processing and secure communications. Emphasizes applications involving commercial and defense systems.

Prerequisites
CSI 615, and CSI 783 or 784; or permission of instructor.

CSI 717 - Quantum Computer Programming

Credits: 3
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.

Prerequisites
CSI 615 or equivalent, or permission of instructor.
CSI 718 - Quantum Computer Realization

Credits: 3
Introduces physical implementation of quantum computation, and practical applications to developing scalable quantum computers. Special emphasis on various schemes for achieving practical quantum computers.

Prerequisites
CSI 615, and 784 or equivalent; or permission of instructor.

CSI 719 - Topics in Computational Chemistry

Credits: 3
Covers selected topics in computational chemistry not covered in fixed-content computational chemistry courses.

Prerequisites
Permission of instructor.

Notes
May be repeated for credit as needed.

CSI 720 - Fluid Mechanics

Credits: 3
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.

Prerequisites
CSI 700 and 780; or permission of instructor.
CSI 721 - Computational Fluid Dynamics I

Credits: 3
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.

Prerequisites
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
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.

Prerequisites
CSI 721 or permission of instructor.

 CSI 723 - Fluid Mechanics II

Credits: 3
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.

Prerequisites
CSI 720 or permission of instructor.
CSI 729 - Topics in Continuum Systems

Credits: 3
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.

Prerequisites
Permission of instructor.

Notes
May be repeated for credit as needed.

CSI 739 - Topics in Bioinformatics

Credits: 3
Selected topics in bioinformatics not covered in fixed-content bioinformatics courses.

Prerequisites
Permission of instructor.

Notes
May be repeated for credit as needed.

CSI 740 - Numerical Linear Algebra

Credits: 3
Cross-Listed with MATH 625

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.

**Prerequisites**
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
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.

**Prerequisites**
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
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.

**Prerequisites**
Permission of instructor.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**CSI 746 - Wavelet Theory**

Credits: 3
Cross-Listed with MATH 772
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.

Prerequisites
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

CSI 747 - Nonlinear Optimization and Applications

Credits: 3
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.

Prerequisites
MATH 213 and 216, or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

CSI 748 - Symbolic Computation

Credits: 3
Provides mathematical and computational background for computational algebraic geometry and its applications. Includes algebra, geometry, algorithms, concept of Groebner bases, automatic theorem proving, and serial and parallel algorithms and their complexity. Topics are related to applications in engineering and computer science. Students expected to complete projects.

Prerequisites
Undergraduate degree in scientific discipline and course in abstract algebra.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

CSI 749 - Topics in Computational Mathematics
Credits: 3
Selected topics in computational mathematics not covered in fixed-content computational mathematics courses.

Prerequisites
Permission of instructor.

Notes
May be repeated for credit as needed.

Hours of Lecture or Seminar per week
3

CSI 750 - Earth Systems and Global Changes

Credits: 3
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.

Prerequisites
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
Cross-Listed with EOS 754

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.

Prerequisites
EOS 753 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  
Cross-Listed with EOS 757

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.

Prerequisites  
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

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.

Prerequisites  
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  
Cross-Listed with ASTR 761

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.

Prerequisites  
PHYS 613/CSI 780 and CSI 700; or permission of instructor.

Hours of Lecture or Seminar per week  
3
CSI 763 - Statistical Methods in Space Sciences

Credits: 3
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.

Prerequisites
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
Cross-Listed with ASTR 764

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-lanck 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.

Prerequisites
ASTR 530.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

CSI 765 - High-Energy and Accretion Astrophysics

Credits: 3
Cross-Listed with ASTR 765

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.

**Prerequisites**
PHYS 502, ASTR 530, and PHYS 613/CSI 780; or permission of instructor.

**Hours of Lecture or Seminar per week**
3

**CSI 766 - Relativity and Cosmology**

Credits: 3  
**Cross-Listed with** ASTR 766

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.

**Prerequisites**
ASTR 530 and MATH 314, or permission of instructor.

**Hours of Lecture or Seminar per week**
3

**CSI 769 - Topics in Space Sciences**

Credits: 3  
**Cross-Listed with** ASTR 769

Selected topics in space sciences not covered in fixed-content space sciences courses.

**Prerequisites**
Permission of instructor.

**Notes**
May be repeated for credit as needed.

**CSI 771 - Computational Statistics**
Credits: 3

**Cross-Listed with** STAT 751

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.

**Prerequisites**
STAT 544, 554, and 652.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

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**CSI 772 - Statistical Learning**

Credits: 3
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.

**Prerequisites**
CSI 672 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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**CSI 773 - Statistical Graphics and Data Exploration**

Credits: 3

**Cross-Listed with** STAT 663

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.

**Prerequisites**
300-level course in statistics; STAT 554 strongly recommended.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0
CSI 775 - Computational Models of Probabilistic Reasoning

Credits: 3
Cross-Listed with OR 719/STAT 719

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.

Prerequisites
STAT 652 or 664, or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

CSI 776 - Stochastic Differential Equations

Credits: 3
Cross-Listed with IT 746

Introduces modern theory of stochastic calculus. Covers stochastic integrals, martingales, counting processes, diffusion processes, and Ito-type processes in general. Considers applications of these methods to engineering, biology, and economics.

Prerequisites
STAT 652, ECE 630 or 632, or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

CSI 777 - Principles of Knowledge Mining

Credits: 3

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.

Prerequisites
INFS 614 or equivalent, or permission of instructor.
CSI 779 - Topics in Computational Statistics

Credits: 3
Selected topics in computational statistics not covered in fixed-content computational statistics courses.

Prerequisites
Permission of instructor.

Notes
May be repeated for credit as needed.

CSI 780 - Computational Physics and Applications

Credits: 3
Cross-Listed with PHYS 613

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.

Prerequisites
PHYS 502; FORTRAN, C, or C++ programming; or permission of instructor.

CSI 781 - Plasma Science

Credits: 3
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.
Prerequisites
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
Cross-Listed with PHYS 711/CHEM 730

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.

Prerequisites
PHYS 502 and CSI 780, 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
Cross-Listed with PHYS 736/CHEM 736

Studies fundamental concepts of quantum mechanics from 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.

Prerequisites
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
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.

Prerequisites
PHYS 613/CSI 780 or CHEM 633/CSI 711, or permission of instructor.

Hours of Lecture or Seminar per week
3

CSI 787 - Computational Materials Science

Credits: 3
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.

Prerequisites
PHYS 512/CSI 687 and PHYS 736/CSI 783, or permission of instructor.

Hours of Lecture or Seminar per week
3

CSI 788 - Simulation of Large-Scale Physical Systems

Credits: 3
Cross-Listed with PHYS 728

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.

Prerequisites
PHYS 613/CSI 780 and CSI 700, or permission of instructor.

Hours of Lecture or Seminar per week
3

CSI 789 - Topics in Computational Physics


CSI 780 - Computational Physics

Credits: 3
Cross-Listed with PHYS 780

Selected topics in computational physics not covered in fixed-content computational physics courses.

Prerequisites
Permission of instructor.

Notes
May be repeated for credit as needed.

Hours of Lecture or Seminar per week
3

CSI 796 - Directed Reading and Research

Credits: 1-6

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.

Prerequisites
Permission of instructor.

Hours of Lecture or Seminar per week
0

CSI 798 - Research Project

Credits: 3

Project chosen and completed under guidance of graduate faculty member, resulting in acceptable technical report.

Prerequisites
12 graduate credits, and permission of instructor.

Hours of Lecture or Seminar per week
0

Hours of Lab or Studio per week
0
CSI 799 - Master's Thesis

Credits: 1-6
Project chosen and completed under guidance of graduate faculty member, resulting in acceptable technical report (master's thesis) and oral defense.

Prerequisites
12 graduate credits, and permission of instructor.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
0
Grading
S/IP

CSI 819 - Quantum Information Science Topics

Credits: 3
Selected topics in quantum information science not covered in fixed-content computational sciences courses.

Prerequisites
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 853 - Atmospheric Transport and Dispersion

Credits: 3
Develops basic concepts, theories, and models describing pollutant dispersal in atmosphere. Discusses related atmospheric systems affecting transport, transformation, and removal of air pollutants, with strong emphasis on fundamental issues associated with hazard prediction. Content essential for students engaging in graduate research in atmospheric transport and dispersion modeling.

Prerequisites
CLIM 710 or 711 or equivalent, or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0
CSI 854 - Hyperspectral Imaging Applications

Credits: 3
Cross-Listed with EOS 840

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.

Prerequisites
EOS 754 or permission of instructor.

Prerequisites/Corequisites
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

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.

Prerequisites
CS 580 or equivalent, or permission of instructor.

Hours of Lecture or Seminar per week
0

Hours of Lab or Studio per week
0

CSI 876 - Measure and Linear Spaces

Credits: 3
Cross-Listed with IT 876/STAT 876

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.

Prerequisites
IT 776 or permission of instructor.
CSI 877 - Geometric Methods in Statistics

Credits: 3
Cross-Listed with IT 877/STAT 877

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.

Prerequisites
STAT 751 or permission of instructor.

CSI 885 - Atomistic Modeling of Materials

Credits: 3

Advanced course focusing on utilization of atomistic modeling and computer simulation techniques to analyze structure of crystalline materials. Introduces modern methodology of largescale atomistic simulations, and provides hands-on experience through numerous examples and homework assignments based on simulation package SOLD (Simulator of Lattice Defects). Provides background knowledge on theory of lattice defects (point defects, interfaces, dislocations) and thermal and mechanical properties of solid materials (plastic deformation, fracture).

Prerequisites
CSI 685, 700, and 786; or permission of instructor.

CSI 888 - Topics in Quantum Systems

Credits: 3

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.

**Prerequisites**
PHYS 736/CSI 783 or PHYS 732/CSI 784; or 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 898 - Research Colloquium in Computational Sciences and Informatics**

Credits: 1
Presentations in specific research areas in 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.

**Hours of Lecture or Seminar per week**
1

**Hours of Lab or Studio per week**
0

**Grading**
S/NC

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**CSI 899 - Colloquium in Computational Sciences and Informatics**

Credits: 1
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.

**Hours of Lecture or Seminar per week**
1

**Hours of Lab or Studio per week**
0

**Grading**
S/NC

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**CSI 909 - Advanced Topics in Computational Sciences and Informatics**
Credits: 3
Covers selected topics in computational sciences and informatics not covered in fixed-content courses.

**Prerequisites**
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

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**CSI 972 - Mathematical Statistics I**

Credits: 3
**Cross-Listed with** IT 972/STAT 972

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.

**Prerequisites**
STAT 652 or equivalent.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

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**CSI 973 - Mathematical Statistics II**

Credits: 3
**Cross-Listed with** IT 973/STAT 973

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.

**Prerequisites**
CSI 972.

**Notes**
Continuation of CSI 972.

**Hours of Lecture or Seminar per week**
3
CSI 976 - Statistical Inference for Stochastic Processes

Credits: 3

Cross-Listed with IT 976

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.

Prerequisites
CSI 776 or permission of instructor.

CSI 978 - Statistical Analysis of Signals

Credits: 3

Cross-Listed with IT 978

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 eigen-value 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.

Prerequisites
STAT 544 and 658, or equivalent.

CSI 979 - Advanced Topics in Computational Statistics

Credits: 3

Cross-Listed with IT 979

Covers selected topics in computational statistics not covered in fixed-content computational statistics courses.

Prerequisites
Permission of instructor.
CSI 986 - Advanced Topics in Large-Scale Physical Simulation

Credits: 3
Covers simulation of physical systems not covered in fixed-content physical simulation courses.

Prerequisites
Permission of instructor.

Notes
May be repeated for credit as needed.

CSI 991 - Seminar in Scientific Computing

Credits: 1
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.

CSI 996 - Doctoral Reading and Research

Credits: 1-6
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.
Prerequisites
Admission to doctoral program, and permission of instructor.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
0

CSI 998 - Doctoral Dissertation Proposal

Credits: 1-12

Prerequisites
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
S/IP

CSI 999 - Doctoral Dissertation

Credits: 1-12
Involves doctoral dissertation research under direction of dissertation director.

Prerequisites
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
S/IP

CSS 600 - Introduction to Computational Social Science
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
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.

**Prerequisites/Corequisites**
CSS 600, or approval by instructor and program director.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**CSS 610 - Computational Analysis of Social Complexity**

Credits: 3
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).

**Prerequisites/Corequisites**
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
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.

**Prerequisites/Corequisites**
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
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.

**Prerequisites/Corequisites**
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
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.

**Prerequisites/Corequisites**
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
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.

**Prerequisites/Corequisites**
CSS 600 and 610, or permission of instructor.

**Hours of Lecture or Seminar per week**
3
CSS 640 - Human and Social Evolutionary Complexity

Credits: 3
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.

Prerequisites/Corequisites
CSS 600 and 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
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.

Prerequisites/Corequisites
CSS 600, GEOG 550, 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
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.

Prerequisites/Corequisites
GEOG 631 or CSS 600, or permission of instructor.

Notes
CSS 600 may be taken concurrently.

Hours of Lecture or Seminar per week
3
CSS 650 - Physics Methods for Analyzing Social Complexity

Credits: 3
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.

Prerequisites/Corequisites
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
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.

Prerequisites/Corequisites
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
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.

Prerequisites/Corequisites
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
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.

Prerequisites/Corequisites
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
Selected topics in computational social science not covered in fixed-content computational social science courses.

Prerequisites
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
Reading and research on specific topic in computational social science under direction of a faculty member.

Prerequisites
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
Project chosen and completed under guidance of graduate faculty member, resulting in acceptable technical report.

Prerequisites
12 graduate credits from core requirements, and permission of instructor.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
0

CSS 799 - Master's Thesis

Credits: 1-6
Project chosen and completed under guidance of graduate faculty member, resulting in acceptable technical report (master's thesis) and oral defense.

Prerequisites
12 graduate credits from CSS core, and permission of instructor.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
0
Grading
S/IP

CSS 898 - Research Colloquium in Computational Social Science

Credits: 1
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

CSS 899 - Colloquium in Computational Social Science
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

Credits: 3
Covers selected topics in computational social science and socioinformatics not covered in fixed-content courses.

Prerequisites
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
Reading and research on specific topic in computational social science under direction of faculty member.

Prerequisites
Admission to doctoral program, and permission of instructor.

Notes
May be repeated as necessary.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
0

CSS 998 - Doctoral Dissertation Proposal
Credits: 1-12
Covers development of research proposal, which forms basis for doctoral dissertation, under guidance of dissertation director and doctoral committee.

**Prerequisites**
Permission of instructor.

**Notes**
May be repeated as needed, but no more than 12 credits of CSS 998 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

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**CSS 999 - Doctoral Dissertation**

Credits: 1-12
Doctoral dissertation research under direction of dissertation director.

**Prerequisites**
Approval of dissertation proposal.

**Notes**
May be repeated as needed, but no more than 24 credits in CSS 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

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**CTCH 601 - The Community College**

Credits: 3
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

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**CTCH 602 - College Teaching**
Credits: 3
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
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.

**Prerequisites**
Basic familiarity with computer operations

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**CTCH 604 - The Scholarship of Teaching and Learning**

Credits: 3
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.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**CTCH 605 - Curriculum and Program Design and Assessment**

Credits: 3
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.

**Prerequisites**
CTCH 601 or 602, and 603.

**Hours of Lecture or Seminar per week**
3
CTCH 606 - Diversity in Higher Education

Credits: 3
Explores instructional interactions and communication strategies for diverse learner populations. Includes discussion of sociological, behavioral, and cognitive theory on culture.

Hours of Lecture or Seminar per week
3

CTCH 621 - Higher Education in the United States

Credits: 3
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.

Hours of Lecture or Seminar per week
3

CTCH 622 - Organization and Administration in Higher Education

Credits: 3
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

CTCH 624 - Finance and Fiscal Management in Higher Education

Credits: 3
Overview of higher education finance and fiscal management.

Hours of Lecture or Seminar per week
3
CTCH 626 - Assessment in Higher Education

Credits: 3
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.

CTCH 641 - Introduction to Counseling

Credits: 3
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.

CTCH 643 - Counseling Theory and Practice in Higher Education

Credits: 3
Study of historical contemporary approaches to counseling. Emphasizes applications of theoretical models as appropriate for higher education.

CTCH 644 - Student Services in Higher Education

Credits: 3
Focuses on development and organization of student personnel programs and services in institutions of higher learning. Covers philosophy, methods, and techniques.
### CTCH 645 - The Contemporary College Student

Credits: 3  
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.

### CTCH 685 - Practicum

Credits: 3  
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.

**Prerequisites**  
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.

### CTCH 792 - Special Topics in Higher Education

Credits: 1-6  
Covers current issues in teaching and learning in higher education.

**Prerequisites**  
Admission to doctoral program, or permission of instructor.

**Notes**  
May be repeated for credit when topic is different.
CTCH 821 - History of Higher Education in the United States

Credits: 3
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.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

CTCH 826 - Advanced Institutional and Program Assessment in Higher Education

Credits: 3
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.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

CTCH 830 - Ethics in Higher Education: Personal, Organizational, and Institutional Realities

Credits: 3
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.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

CTCH 885 - Doctoral Internship in College Teaching and Administration
Credits: 3
Students must contact the program at least one semester before enrolling. Supervised internship at community college, four-year college/university, or nonteaching higher-education setting such as government agency or administrative office. Develops skills applicable to college-based teaching or higher education administration or policy.

Prerequisites
Admission to doctoral program, approval of advisor and internship coordinator, 18 credits of graduate course work

Notes
Minimum 180 hours of work and participation in internship seminar.

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
Independent reading on topic agreed on by student and instructor.

Prerequisites
Admission to doctoral program and permission.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
0

CTCH 998 - Doctoral Dissertation Proposal

Credits: 1-3
Contact program for permission to register. Work on research proposal that forms basis for doctoral dissertation.

Prerequisites
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
Doctoral dissertation research and writing under direction of dissertation committee.

Prerequisites
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

CULT 320 - Globalization and Culture

Credits: 3
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.

Prerequisites
30 credits; GLOA 101 or SOCI 120.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

CULT 802 - Histories of Cultural Studies

Credits: 3
Historical survey of principal works and theories of cultural studies. Provides overview of contemporary situation of cultural studies and assesses possibilities for future development.

Prerequisites
Admission to program, MA feeder track, or permission of instructor

Notes
Required of all students.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

CULT 806 - Research Seminar in Cultural Studies
CULT 808 - Student/Faculty Colloquium in Cultural Studies

Credits: 1
Forum for presentation of original and current research in cultural studies.

Prerequisites
Admission to program, or permission of instructor.

Notes
Students register for 1 credit per semester over a three-semester period.

Hours of Lecture or Seminar per week
1

Hours of Lab or Studio per week
0

CULT 810 - Culture and Political Economy

Credits: 3
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.

Prerequisites
Admission to program, or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

CULT 812 - Visual and Performance Culture
Credits: 3
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.

Prerequisites
Admission to program, or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

CULT 814 - Gender and Sexuality

Credits: 3
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.

Prerequisites
Admission to program, or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

CULT 816 - Science/Technology

Credits: 3
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.

Prerequisites
Admission to program, or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

CULT 818 - Social Institutions

Credits: 3
Considers theories of institutional practice and social structures, from Max Weber to Michel Foucault. Covers prisons, bureaucracies, museums, schools, political parties, and social movements.
Prerequisites
Admission to program, or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

CULT 820 - After Colonialism: Race, Ethnicity, Nationalism

Credits: 3
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.

Prerequisites
Admission to program, or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

CULT 860 - Special Topics in Cultural Studies

Credits: 1-3
Specialized interdisciplinary topics in cultural theory and analysis.

Prerequisites
Admission to program, or permission of instructor.

Notes
Content varies. May be repeated.

Hours of Lecture or Seminar per week
1-3

Hours of Lab or Studio per week
0

CULT 870 - Directed Readings

Credits: 3
Intensive reading course to develop comprehensive coverage for specific fields as agreed on in with advisors.

Notes
May be repeated.
CULT 880 - Independent Study

Credits: 1-3
Reading and research on specific topic, resulting in a written project.

Notes
May be repeated.

CULT 998 - Doctoral Dissertation Proposal

Credits: 1-6
Work on research proposal that forms basis for doctoral dissertation. Students must have completed all cultural studies course work, fulfilled foreign language requirement, and passed comprehensive exam.

Notes
Course may be repeated once for credit.

CULT 999 - Doctoral Dissertation

Credits: 1-12
Doctoral dissertation research and writing under direction of dissertation committee.

Prerequisites
Completion of CULT 998, and public presentation of dissertation proposal.

Grading
S/NC
CVPA 101 - Arts Pass

Credits: 2
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

CVPA 102 - Experiencing the Arts

Credits: 3
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.

Notes
Not repeatable.

Hours of Lecture or Seminar per week
1

Hours of Lab or Studio per week
2

Grading
S/NC

CVPA 105 - Special Topics in the Arts

Credits: 1-3
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 305 - Seminar in Arts Management

Credits: 3
Covers planning, programming, presentation, funding, and communications in managing visual and performing arts. Includes guest speakers, case analyses, and semester-long individual and group projects.

Prerequisites
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

CVPA 308 - Cross-Cultural Arts Appreciation

Credits: 3
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
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
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.

**Prerequisites**
Junior standing, or permission of instructor.

**Notes**
Topic depends on instructor. May be repeated for up to 9 credits if taken under different topics.

**CVPA 489 - Field Experience in the Arts**
Credits: 3-6
Apprenticeship, internship, or project with organization or individual in the arts. Must be prearranged with division director before enrollment.

**Prerequisites**
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.

**CVPA 499 - Research/Performance/Topics in the Arts**
Credits: 3-6
Advanced research, performance, or exploration of topical studies in arts.

**Notes**
May be repeated for maximum 6 credits.

**CVPA 530 - Topics in Arts and Wellness**
Credits: 1-3
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.

**Prerequisites**
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

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**CVPA 592 - Special Topics in Interdisciplinary Arts Studies**

Credits: 1-3
Topics in interdisciplinary arts.

**Prerequisites**
Undergraduate degree or equivalent, or permission of instructor.

**Notes**
May be repeated for maximum 12 credits.

**Hours of Lecture or Seminar per week**
3

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**CVPA 599 - Independent Study**

Credits: 1-6
Independent reading, performance, or research on specific project under direction of selected faculty member. May include attendance in parallel undergraduate course.

**Prerequisites**
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

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**CVPA 700 - Academic Writing in the Arts**
Credits: 1
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

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**CVPA 701 - Thesis and Project Writing**

Credits: 1
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.

**Hours of Lecture or Seminar per week**
1

**Hours of Lab or Studio per week**
0

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**DANC 101 - Dance Appreciation**

Credits: 3
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.

**Notes**
Meets general education fine arts requirement.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

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**DANC 114 - Rhythmic Analysis and Music Resources for Dance**

Credits: 3
Introduces rhythmic structure, notation, and basic forms of music. Experience with audio equipment in creating simple sound scores.

**Prerequisites**
Admission to dance major or permission of instructor.

**Notes**
Lecture, lab.

**Hours of Lecture or Seminar per week**
DANC 118 - World Dance

Credits: 3
Develops knowledge, skills, and appreciation of world dance forms through presentation of fundamental techniques, music, and culture. Area of concentration varies to include as many cultures as possible.

Notes
May be repeated for total 6 credits. Fulfills non-Western requirement for CHSS and COS students, and global understanding requirement of university general education.

DANC 119 - Dance in Popular Culture: Afro-Latino Dance

Credits: 3
Develops knowledge, skills, and appreciation of popular dance forms through presentation of fundamental techniques, music, and culture. Area of concentration varies to include as many idioms as possible.

Notes
Meets general education fine arts requirement. May be repeated for total 6 credits.

DANC 120 - Special Topics in Dance

Credits: 1-3
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.
DANC 125 - Beginning Modern Dance

Credits: 3
Develops knowledge, skills, and appreciation of modern dance through presentation of fundamental techniques and creative movement experiences.

Notes
Meets general education fine arts requirement. May be repeated for total 6 credits.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

DANC 131 - Beginning Jazz Technique

Credits: 3
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.

Notes
Meets general education fine arts requirement. May be repeated for 6 credits.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

DANC 145 - Beginning Ballet

Credits: 3
Introduces elements of ballet technique and vocabulary. Stresses learning elementary positions and movements characteristic of this highly stylized art form.

Notes
Meets general education fine arts requirement. May be repeated for total 6 credits.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0
DANC 150 - Dance Improvisation

Credits: 3
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.

Prerequisites
Admission to dance major or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

DANC 161 - Beginning Tap Dance

Credits: 3
Elementary exploration into rhythms and steps basic to art form of tap dancing including its musical and cultural traditions.

Notes
Meets general education fine arts requirement. May be repeated for total 6 credits.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

DANC 170 - Orientation to Dance Production

Credits: 1
Introduces sound, lighting, and stage management elements and terminology as related to dance performance. Intensive workshop setting emphasizes laboratory experience.

Prerequisites
Admission to dance major or permission of instructor.

Hours of Lecture or Seminar per week
1

Hours of Lab or Studio per week
1

DANC 210 - Dynamic Alignment

Credits: 3
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.

**Prerequisites**
Admission to dance major or permission of instructor.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

### DANC 225 - Beginning Intermediate Modern Dance

Credits: 3
Further develops knowledge, skills, and appreciation of modern dance through continued exploration of techniques, aesthetics, and creativity.

**Prerequisites**
DANC 125 or permission of instructor.

**Notes**
Meets general education fine arts requirement. May be repeated for total 9 credits.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

### DANC 231 - Intermediate Jazz Technique

Credits: 3
Continued study of the concepts of jazz dance technique, and in-depth study of 20th-century jazz dance forms. Emphasizes furthering anatomical awareness and alignment, developing technical clarity, and mastering rhythm and syncopation. Continues exploration of jazz improvisation and choreography.

**Prerequisites**
DANC 131 or permission of instructor.

**Notes**
Meets general education fine arts requirement. May be repeated for 12 credits.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

### DANC 245 - Beginning Intermediate Ballet
Further development of knowledge, skills, and appreciation through technique, vocabulary, and history of ballet.

**Prerequisites**
DANC 145 or permission of instructor.

**Notes**
Meets general education fine arts requirement. May be repeated for total 9 credits.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

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**DANC 251 - Dance Composition I**

Credits: 3
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.

**Prerequisites**
DANC 150 or permission of instructor.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

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**DANC 252 - Dance Composition II**

Credits: 3
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.

**Prerequisites**
DANC 251 or permission of instructor.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0
DANC 270 - Dance Production Lab

Credits: 1
Practical experience in stage crew, sound, or lighting of dance productions through rehearsal to public performance for university dance concerts or guest artist programs.

Prerequisites
DANC 170 or permission of instructor.

Notes
May be repeated for total 6 credits.

Hours of Lecture or Seminar per week
1
Hours of Lab or Studio per week
1

DANC 301 - What is Dance?

Credits: 3
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.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

DANC 314 - Music Accompaniment for Dance

Credits: 3
Lecture practicum course that gives both dance and music students practical experience in dance accompaniment, primarily through using percussion instruments. Students use knowledge of music and rhythm to accompany and enhance a dance technique class.

Prerequisites
DANC 114 or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0
DANC 318 - Global Perspectives: World Dance Forms

Credits: 3
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.

Prerequisites
Completion of DANC 118, 119, or 120; or junior standing; or permission of instructor.

Notes
May be repeated for total 6 credits. Meets general education global understanding requirement.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

DANC 324 - Introduction to Dance Conditioning

Credits: 1-3
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.

Prerequisites
Admission to the BA or BFA dance major

Notes
May be repeated for a total of 12 credits

Hours of Lecture or Seminar per week
1-3

DANC 325 - Intermediate Modern Dance

Credits: 1-3

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.

Prerequisites
Admission to dance major or permission of instructor.

Notes
Meets general education fine arts requirement. May be repeated for total 24 credits.
DANC 326 - Dance Performance Practicum

Credits: 1
Practical experience in dance performance through rehearsal process of university dance concerts.

Prerequisites
Audition.

Notes
May be repeated for total 8 credits.

DANC 331 - Advanced Jazz Dance

Credits: 3
In-depth studio study of 20th 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.

Notes
Meets general education fine arts requirement.

DANC 345 - Intermediate Ballet

Credits: 1-3
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.

Prerequisites
Admission to dance major, or permission of instructor.

Notes
Meets general education fine arts requirement. May be repeated for 24 credits.

**Hours of Lecture or Seminar per week**
1-3

**Hours of Lab or Studio per week**
0

### DANC 350 - Advanced Dance Improvisation

Credits: 1-3
Lecture and performance course for continued study of dance improvisation, including contact improvisation. Students create and direct advanced problems in dance improvisation.

**Prerequisites**
DANC 325 and 150, or permission of instructor.

**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

### DANC 360 - Choreography

Credits: 3
Continued choreographic exploration and research, culminating in bringing completed works to production.

**Prerequisites**
DANC 252, or permission of instructor.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

### DANC 362 - Directed Choreography

Credits: 1
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.

**Prerequisites**
DANC 252 or permission of instructor.

**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 370 - Dance Performance

Credits: 1
Practical experience in performance, repertory, and choreography through rehearsal and public performance of university dance concerts or guest artist programs.

Prerequisites
Admission to dance major and audition; or permission of instructor.

Notes
May be repeated for total 12 credits.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
3

DANC 371 - Residency Workshop

Credits: 1
Rehearsal and performance of new or restaged dance by guest choreographer in intensive rehearsal setting.

Prerequisites
Admission to dance major and audition.

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 372 - Advanced Dance Production

Credits: 1
Methodology and practice of stage make-up, costume design, and lighting as dictated by specific needs of dance performance.

Prerequisites
DANC 170 and 270, or permission of instructor.
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: Pre-Twentieth Century

Credits: 3
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.

Notes
Meets general education fine arts requirement.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

DANC 391 - Dance History: Twentieth Century

Credits: 3
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.

Notes
Meets general education fine arts requirement.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

DANC 399 - Independent Study

Credits: 1-3
Individual research or creative project supervised by faculty member.

Prerequisites
Permission of instructor.
DANC 410 - Introduction to Contemporary Movement Theories

Credits: 3
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.

DANC 418 - Global Dance Intensive

Credits: 1-3
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.

DANC 420 - Special Topics in Dance

Credits: 1-3
In-depth presentation and exploration of topical studies in dance or related study areas.

Prerequisites
9 credits of dance courses, or permission of instructor.

Notes
Topic depends on instructor. May be repeated for total 9 credits.
DANC 425 - Advanced Modern Dance

Credits: 1-3

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.

Prerequisites
Admission to dance major, or permission of instructor.

Notes
Meets general education fine arts requirement. May be repeated for 24 credits.

DANC 445 - Advanced Ballet

Credits: 1-3

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.

Prerequisites
Admission to dance major, or permission of instructor.

Notes
Meets general education fine arts requirement. May be repeated for 24 credits.

DANC 453 - Teaching Creative Movement

Credits: 3

Provides theory, methodology, and practicum experience in preparation for teaching creative movement to children K-12, with some application to special populations.
Prerequisites
DANC 325 and 150, or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

DANC 454 - Methods of Teaching Dance

Credits: 3
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.

Prerequisites
6 credits of intermediate or advanced dance technique, and DANC 210.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

DANC 455 - Teaching Practicum

Credits: 1-6
Full semester of supervised teaching experience in approved school or studio dance program. Credits based on number of teaching contact hours per week.

Prerequisites
DANC 454, and permission of instructor.

Notes
May be repeated for total 12 credits.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

DANC 480 - Introduction to Laban Movement Analysis

Credits: 3
Introduces components of laban movement analysis: body, shape, effort, and space. Includes motif writing for recording and analyzing movement.
Prerequisites
DANC 210, or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

DANC 490 - Senior Dance Seminar

Credits: 3
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.

Prerequisites
Senior status in dance major program.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

DANC 501 - Graduate Dance Seminar

Credits: 3
Presentation and discussion of current issues in dance specific to education, research, and professional development.

Prerequisites
Admission to MFA in dance program.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

DANC 510 - Contemporary Movement Theories

Credits: 3
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. Theories studied may include: Alexander Technique, Feldenkrais Method®, Body-Mind Centering, and Ideokinesis.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

DANC 520 - Special Topics in Dance

Credits: 1-3
In-depth presentation and exploration of topical studies in dance or related study areas.

Prerequisites
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
0

DANC 525 - Advanced Modern Dance

Credits: 1-3
Advanced training in modern technique emphasizing attainment of high technical ability and performing skills.

Prerequisites
Admission to MFA in dance program, or permission of instructor.

Notes
May be repeated for total 18 credits.

Hours of Lecture or Seminar per week
1-3
Hours of Lab or Studio per week
0

DANC 545 - Advanced Ballet

Credits: 1-3
Advanced training in ballet technique with emphasis on high technical quality, performance skills, ballet vocabulary, and styles.

Prerequisites
Admission to MFA in dance program, or permission of instructor.

Notes
May be repeated for total 18 credits.
**DANC 553 - Teaching Creative Movement**

Credits: 3  
Provides theory, methodology, and practicum experience in preparation for teaching creative movement to children K-12, with some application to special populations.  

**Prerequisites**  
Graduate status, or permission of instructor.

**Hours of Lecture or Seminar per week**  
3  
**Hours of Lab or Studio per week**  
0

**DANC 560 - Advanced Choreography**

Credits: 3  
Intensive study and exploration of advanced choreographic forms culminating in public performance of complete dance work.  

**Prerequisites**  
Admission to MFA in dance program, or permission of instructor.

**Notes**  
May be repeated for total 12 credits.

**Hours of Lecture or Seminar per week**  
3  
**Hours of Lab or Studio per week**  
0

**DANC 562 - Directed Choreography**

Credits: 1-3  
Individual choreographic project supervised by faculty member.  

**Prerequisites**  
Admission to MFA in dance program, and permission of instructor.

**Notes**  
May be repeated for total 6 credits.

**Hours of Lecture or Seminar per week**  
3
DANC 570 - Advanced Dance Performance

Credits: 1-3
Advanced performance through participation in university productions and professional dance companies.

Prerequisites
Admission to MFA in dance program, and audition.

Notes
May be repeated for total 12 credits.

DANC 571 - Residency Workshop

Credits: 1
Rehearsal and performance of new or restaged dance by guest choreographer in intensive rehearsal setting.

Prerequisites
Admission to MFA in dance program, and audition.

Notes
May be repeated for total 6 credits.

DANC 580 - Laban Movement Analysis

Credits: 3
Introduces components of laban movement analysis: body, shape, effort, and space. Includes motif writing for recording and analyzing movement.

Prerequisites
Admission to MFA in dance program, or permission of instructor.

Hours of Lecture or Seminar per week
3
DANC 598 - Philosophy and Aesthetics of Dance

Credits: 3  
Study of philosophical theories and aesthetic principles of dance as a performing art.

Prerequisites
DANC 390 and 391, or permission of instructor.

DANC 599 - Independent Study

Credits: 1-6  
Individual research or creative project in close consultation with instructor.

Prerequisites
Admission to MFA in dance program, and permission of instructor.

Notes
May be repeated for total 6 credits.

DANC 615 - Contemporary Trends

Credits: 3  
Study of contemporary art and artists and their ideas and practices as they relate to the making of new work.

Prerequisites
Graduate standing.
DANC 627 - Advanced Teaching Seminar

Credits: 3
Discussion of advanced problems in teaching from scientific and creative points of view.

Prerequisites
DANC 454, admission to MFA in dance program, or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

DANC 680 - Dance Management

Credits: 3
Exploration of technical, financial, and economic aspects of dance management, including marketing, fundraising, publicity, incorporation, booking, nonprofit vs. profit-making groups, and issues relating to current practices in performing arts industry.

Prerequisites
Admission to MFA in dance program.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

DANC 790 - Internship

Credits: 1-3
Study involving intensive professional experience through sponsorship by a dance company, agency, or other arts organization in management, administration, performance, choreography, or teaching.

Prerequisites
Admission to MFA in dance program, and permission of advisor.

Notes
May be repeated for total 6 credits.

Hours of Lecture or Seminar per week
0

Hours of Lab or Studio per week
0

DANC 799 - Thesis
Credits: 1-6
Original research, including written work and public performance, under direction of thesis committee.

**Prerequisites**
Admission to MFA in dance program, permission of advisor, and approval of proposal.

**Notes**
May be repeated for total 6 credits.

**Hours of Lecture or Seminar per week**
0

**Hours of Lab or Studio per week**
0

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**EC 511 - E-commerce Basic IT Infrastructure**

Credits: 3
Discusses basic networking infrastructure used in e-commerce environments and typical multitiered e-commerce architectures of e-commerce sites. Includes ISO OSI reference architecture; functions, main features of IP protocol; functions, main features of TCP protocol including connection establishment, error control, and congestion control; HTTP protocol; and load balancers, web servers, application servers, and database servers in e-commerce site architecture. Discusses software architecture elements such as servlets, transaction processing services, remote method invocation, CGI scripts, and active server pages.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

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**EC 512 - E-commerce Software Services**

Credits: 3
Flow analysis of e-commerce transactions, and role of various software servers, such as web, application, and database servers, in executing e-commerce transactions. Uses various technologies to illustrate typical designs. Covers protocols for authentication and payment in e-commerce; introduction to symmetric and public-key encryption; digital signatures and certificates; and Secure Sockets Layer (SSL) Transport Layer Service (TLS) and secure electronic payment protocols.

**Prerequisites**
EC 511

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

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**EC 521 - Managerial Economics and Decisions of the Firm**
EC 522 - Financial Reporting and Decision Making

Credits: 3
Cross-Listed with MBA 613

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, analysis of economic events and impact on financial reports, analysis of impact of accounting method choices on financial reports, and financial statement analysis.

Prerequisites
Admission to MS in e-commerce program.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

EC 531 - Law and Public Policy in E-commerce

Credits: 3
Cross-Listed with PUBP 726

Legal and policy framework applicable to using advanced communications and information technology. Reviews history of U.S. electronic communications regulation and current transformations. Covers international aspects of global networks, including WTO and WIPO international agreements; European privacy directives; and U.S. experiences. Gives overview of salient public policy issues associated with e-commerce deployment: Internet taxation, regulatory issues, digital divide, transborder data flow, spectrum allocation, privacy, authentication, policy, wireless, and UCITA. Includes lectures, guest speakers from government electronic commerce regulators, practical exercises, and hands-on demonstrations.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0
EC 600 - Group Project in Electronic Commerce

Credits: 3-6
Group projects in electronic commerce selected to illustrate special problems and solutions in development, design, and implementation of e-commerce systems.

Prerequisites
Completion of all core courses and at least 9 credits in MS in e-commerce program.

Hours of Lecture or Seminar per week
3-6
Hours of Lab or Studio per week
0

ECE 101 - Information Technology for Electrical Engineers

Credits: 3
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
1

ECE 201 - Introduction to Signal Analysis

Credits: 3
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.

Prerequisites
Grade of C or better in MATH 113.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
1
When Offered
F, S
ECE 220 - Signals and Systems I

Credits: 3
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.

Prerequisites
C or better in ECE 201 or equivalent.

Corequisite
MATH 203, 214

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
1

When Offered
F, S, SUM

ECE 280 - Electric Circuit Analysis

Credits: 5
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.

Prerequisites
Grade of C or better in PHYS 260 and 261

Corequisite
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
2

When Offered
F, S, SUM

ECE 301 - Digital Electronics

Credits: 3
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.

Notes
Not intended for those majoring in electrical or computer engineering.

**ECE 303 - Digital Design/Intro Assembly Language**

Credits: 4
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.

Prerequisites
CS 211 or IT 101, 108, and 212.

Notes
Not intended for electrical or computer engineering majors.

**ECE 305 - Electromagnetic Theory**

Credits: 3
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.

Prerequisites
Grade of C or better in PHYS 260 and MATH 214.
ECE 320 - Signals and Systems II

Credits: 3
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. Studies random signals in continuous and discrete time. Presents application examples from communications, circuits, control, and signal processing.

Prerequisites
Grade of C or better in ECE 220 and MATH 203.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
1

When Offered
F, S, SUM

ECE 331 - Digital System Design

Credits: 3
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.

Corequisite
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
F, S

ECE 332 - Digital Electronics and Logic Design Lab

Credits: 1
Lab associated with ECE 331.

Prerequisites
PHYS 261 or 265, or permission of instructor
Corequisite
ECE 331.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
3
When Offered
F, S, SUM

ECE 333 - Linear Electronics I

Credits: 3
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.

Prerequisites
Grade of C or better in ECE 280.

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
F, S, SUM

ECE 334 - Linear Electronics Lab I

Credits: 1
Lab associated with ECE 333.

Prerequisites
PHYS 261 or 265, or permission of instructor

Corequisite
ECE 333.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
3
When Offered
F, S, SUM
ECE 410 - Principles of Discrete-Time Signal Processing

Credits: 3
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.

Prerequisites
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
Cross-Listed with SYST 421

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.

Prerequisites
Grade of C or better in ECE 220, or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0
When Offered
F, S, SUM

ECE 422 - Digital Control Systems

Credits: 3
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.

Prerequisites
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
ECE 429 - Control Systems Lab

Credits: 1
Laboratory experiments for topics in control systems analysis, design, and implementation with emphasis on using microcomputers.

Prerequisites
Grade of C or better in ECE 421.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
3
When Offered
S

ECE 430 - Principles of Semiconductor Devices

Credits: 3
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 phototransistors.

Prerequisites
MATH 214, ECE 305, and a grade of C or better in ECE 333; or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0
When Offered
S

ECE 431 - Digital Circuit Design

Credits: 3
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.

Prerequisites
Grade of C or better in ECE 331 and 333.

Hours of Lecture or Seminar per week
ECE 433 - Linear Electronics II

Credits: 3
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.

Prerequisites
Grade of C or better in ECE 333.

ECE 434 - Linear Electronics II Laboratory

Credits: 1
Second lab course in linear electronics involving analysis and design of topics listed in ECE 433.

Prerequisites
ECE 334
Corequisite
ECE 433.

ECE 435 - Digital Circuit Design Laboratory

Credits: 1
Lab experiments for topics covered in ECE 431.

Prerequisites
ECE 334

Corequisite
ECE 431.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
3
When Offered
F, S

ECE 437 - Principles of Microelectronic Device Fabrication

Credits: 3
Introduces fundamentals of microelectronic semiconductor device fabrication technology. Processing steps include photolithography, oxidation, diffusion, ionimplantation, chemical vapor deposition, ohmic contact metalization, interconnects, packaging, MOS process integration, and bipolar process integration. Laboratory project integral to course.

Prerequisites
ECE 333 or 430, or permission of instructor.

Hours of Lecture or Seminar per week
2
Hours of Lab or Studio per week
3

ECE 445 - Computer Organization

Credits: 3
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.

Prerequisites
Grade of C or better in ECE 331.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0
When Offered
F, S, SUM

ECE 447 - Single-Chip Microcomputers

Credits: 4
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.

**Prerequisites**
Grade of C or better in CS 211 and ECE 332 and 445; and 90 credits toward electrical or computer engineering degree.

**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**
F

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**ECE 448 - FPGA and ASIC Design with VHDL**

Credits: 4
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.

**Prerequisites**
Grade of C or better in ECE 445.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
3

**When Offered**
S

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**ECE 450 - Introduction to Robotics**

Credits: 3
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.

**Prerequisites**
CS 112, ECE 280 and ECE 331 and either ECE 332 or ECE 303, all with grade of C or better.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

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**ECE 460 - Communication and Information Theory**

Credits: 3  
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.

**Prerequisites**
Grade of C or better in ECE 220 and STAT 346 Introduction to analog and digital communications.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

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**ECE 461 - Communication Engineering Laboratory**

Credits: 1  
Lab experiments in analog and digital communication areas covered in ECE 460.

**Prerequisites**
ECE 460 and 334.

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**ECE 462 - Data and Computer Communications**

Credits: 3  
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.
Prerequisites
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

When Offered
F

**ECE 463 - Digital Communications Systems**

Credits: 3
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.

Prerequisites
ECE 460.

Hours of Lecture or Seminar per week
3

**ECE 464 - Modern Filter Design**

Credits: 3
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.

Prerequisites
ECE 320.

Hours of Lecture or Seminar per week
3

**ECE 465 - Computer Networking Protocols**

Credits: 3
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.

Prerequisites
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
S

ECE 467 - Network Implementation Laboratory

Credits: 1
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.

Prerequisites
ECE 462.

Corequisite
ECE 465.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
3

ECE 469 - Microwave Circuit Laboratory

Credits: 1
Introduces microwave engineering laboratory techniques and measurements, and the design, fabrication, and test of microwave microstrip circuits.

Prerequisites
ECE 305 and 334, or permission of instructor.

Hours of Lecture or Seminar per week
1
Hours of Lab or Studio per week
2

ECE 491 - Engineering Seminar
Credits: 1
Engineering ethics, professionalism, role of engineer in society, current topics, and employment opportunities.

Prerequisites
90 credits applicable to electrical engineering or computer engineering program, and COMM 100.

Hours of Lecture or Seminar per week
1
Hours of Lab or Studio per week
0
When Offered
F, S

ECE 492 - Senior Advanced Design Project I

Credits: 1

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.

Prerequisites
Senior status in electrical engineering or computer engineering program, and COMM 100 and ENGL 302.

Hours of Lecture or Seminar per week
1
Hours of Lab or Studio per week
0
When Offered
F, S

ECE 493 - Senior Advanced Design Project II

Credits: 2

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.

Prerequisites
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
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
Topics of special interest to undergraduates.

Prerequisites
Permission of instructor; specific prerequisites vary with nature of topic.

Notes
May be repeated for maximum of 6 credits if topics substantially different.

ECE 511 - Microprocessors

Credits: 3
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.

**Prerequisites**
ECE 445 or equivalent.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

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**ECE 513 - Applied Electromagnetic Theory**

Credits: 3
Maxwell's Equations, electromagnetic wave propagation, wave guides, transmission lines, radiation, and antennas.

**Prerequisites**
ECE 305 or equivalent.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**When Offered**
F

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**ECE 520 - Applications of Analog and Digital Integrated Circuits**

Credits: 3
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, phaselocked loops, multiplexers, active filters, A/D and D/A converters, and optoelectronic circuits.

**Prerequisites**
ECE 433 and 431, or permission of instructor.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

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**ECE 521 - Modern Systems Theory**

Credits: 3
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.
ECE 524 - Process Control Fundamentals

Credits: 3

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.

Prerequisites
Graduate standing.

ECE 525 - Hardware/Software Integration

Credits: 3

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.

Prerequisites
Graduate standing

ECE 528 - Introduction to Random Processes in Electrical and Computer Engineering

Credits: 3

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.

Prerequisites
ECE 220 and STAT 346, or permission of instructor.
ECE 535 - Digital Signal Processing

Credits: 3
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 nonrecursive filters, Fast Fourier Transform algorithms, and spectrum analysis. Additional topics may include adaptive filtering, homomorphic digital signal processing, digital interpolation and decimation, and VLSI signal processors.

Prerequisites
ECE 320 and 528, or permission of instructor.

ECE 537 - Introduction to Digital Image Processing (DIP)

Credits: 3
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.

Prerequisites
Graduate standing.

ECE 540 - Modern Telecommunications

Credits: 3
Cross-Listed with TCOM 500

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.

**Prerequisites**
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

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**ECE 541 - Computer Architectures - A Survey**

Credits: 3
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.

**Prerequisites**
IT 212 or permission of instructor.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

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**ECE 542 - Computer Network Architectures and Protocols**

Credits: 3
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.

**Prerequisites**
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**
F, S, SUM
**ECE 545 - Digital System Design with VHDL**

Credits: 3
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.

**Prerequisites**
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
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.

**Prerequisites**
ECE 331, or permission of instructor.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**When Offered**
S

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**ECE 549 - Theory and Applications of Artificial Neural Networks**

Credits: 3

**Prerequisites**
ECE 320 or equivalent.

**Hours of Lecture or Seminar per week**
0
ECE 563 - Introduction to Microwave Engineering

Credits: 3
Studies propagation, storage of microwave signals. Examines transmission lines, waveguides, resonators, scattering parameters, Smith charts, measurement techniques, instrumentation, and microwave striplines and microstrips.

Prerequisites
ECE 305, or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

ECE 565 - Introduction to Optical Electronics

Credits: 3
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.

Prerequisites
ECE 305 and 333.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

ECE 567 - Optical Fiber Communications

Credits: 3
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.

Prerequisites
ECE 565 or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0
ECE 568 - Introduction to Imaging Sensors

Credits: 3
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.

Prerequisites
Graduate status or permission of instructor.

ECE 584 - Semiconductor Device Fundamentals

Credits: 3
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.

Prerequisites
ECE 430 or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0
When Offered
F

ECE 586 - Digital Integrated Circuits

Credits: 3
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.

Prerequisites
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
F

ECE 587 - Design of Analog Integrated Circuits
Credits: 3
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.

Prerequisites
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
F

ECE 590 - Selected Topics in Engineering

Credits: 3
Selected topics from recent developments, and applications in various engineering disciplines. Designed to help professional engineering community keep abreast of current developments.

Prerequisites
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
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.

Prerequisites
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
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.

**Prerequisites**
ECE 511 or permission of instructor.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

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### ECE 620 - Optimal Control Theory

Credits: 3
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.

**Prerequisites**
ECE 521 or permission of instructor.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

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### ECE 621 - Systems Identification

Credits: 3

**Prerequisites**
ECE 521 and 528, or permission of instructor.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

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### ECE 624 - Control Systems

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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.

Prerequisites
ECE 421 and 521, or permission of instructor.

Notes
Course may include simulation and design project.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

ECE 630 - Statistical Communication Theory

Credits: 3
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.

Prerequisites
ECE 528.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

ECE 633 - Coding Theory

Credits: 3
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.

Prerequisites
ECE 528 or permission of instructor

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

ECE 635 - Adaptive Signal Processing
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.

Prerequisites
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
Cross-Listed with IT 838

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.

Prerequisites
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
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.

Prerequisites
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
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.

Prerequisites
ECE 542 and 528, or equivalent.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

ECE 643 - Switching and Routing in Communication Networks

Credits: 3
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.

Prerequisites
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
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.

Prerequisites
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
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.

Prerequisites
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
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.

Prerequisites
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
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.

Prerequisites
ECE 521 or permission of instructor.

Hours of Lecture or Seminar per week
3
ECE 662 - Microwave Devices

Credits: 3
Studies generation of microwave signals. Topics include solid-state microwave devices and high-power microwave devices and microwave applications.

Prerequisites
ECE 563 or permission of instructor.

 Hours of Lecture or Seminar per week
3

 Hours of Lab or Studio per week
0

ECE 665 - Fourier Optics and Holography

Credits: 3
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.

Prerequisites
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
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.

 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  
**Cross-Listed with** SYST 619

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.

**Prerequisites**
SYST 510 or 520, or ECE 521; 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  
**Cross-Listed with** SYST 620

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.

**Prerequisites**
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  
**Cross-Listed with** SYST 621

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.

**Prerequisites**
ECE 675 - System Integration and Architecture Evaluation

Credits: 3
Cross-Listed with SYST 622

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.

Prerequisites
SYST 620/ECE 673 and SYST 621/ECE 674 or permission of instructor.

ECE 678 - Systems Engineering of Information Architectures

Credits: 3
Cross-Listed with SYST 631

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.

Prerequisites
SYST 520 and SYST 619/ECE 672.

ECE 679 - System Integration and Architecture Evaluation
Credits: 3

Cross-Listed with SYST 632


Prerequisites
SYST 631/ECE 678

Notes
This course does not meet the requirements for the MS-SYST or MS-ELEN degrees.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

ECE 680 - Physical VLSI Design

Credits: 3
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.

Prerequisites
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
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.

Prerequisites
ECE 545, or permission of instructor.

Corequisite
ECE 586
ECE 682 - VLSI Test Concepts

Credits: 3
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, Iddq test, boundary scan and related standards, test synthesis, diagnosis and failure analysis, automated test equipment, embedded core test.

Prerequisites
ECE 586

ECE 684 - MOS Device Electronics

Credits: 3
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.

Prerequisites
ECE 584 or permission of instructor.

ECE 689 - VLSI Processing

Credits: 3
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.

Prerequisites
ECE 584 or permission of instructor.
ECE 698 - Independent Reading and Research

Credits: 3
Studies selected area in electrical and computer engineering under supervision of faculty member.

Prerequisites
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: 3
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.

Prerequisites
Permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

ECE 720 - Multivariable and Robust Control

Credits: 3
Cross-Listed with IT 843
Covers Eigenstructure assignment for multivariable systems, Smith-McMillan form, internal stability, modeling system uncertainty, performance specifications and principal gains, parametrization of controllers, loop shaping and loop transfer recovery, and H methodology.

Prerequisites
ECE 620 or 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
Cross-Listed with IT 846

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 Lyapunov'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.

Prerequisites
ECE 521

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

ECE 722 - Kalman Filtering with Applications

Credits: 3
Cross-Listed with IT 841

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.

Prerequisites
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 728 - Random Processes in Electrical and Computer Engineering

Credits: 3

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.

Prerequisites
ECE 731 - Digital Communications

Credits: 3
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.

Prerequisites
ECE 630 or equivalent.

ECE 732 - Mobile Communication Systems

Credits: 3
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.

Prerequisites
ECE 542 and 630.

ECE 733 - Advanced Coding Theory

Credits: 3
Theory and practice of advanced error-control coding techniques. Topics include trellis and multidimensional codes, Leech lattice, rotationally invariant codes, and spectral analysis and transform coding. Presents applications of contemporary coding theory in mobile communications, magnetic and optical recording, high-speed modem, and high-density data storage design.
Prerequisites
ECE 630 and 633.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

ECE 734 - Detection and Estimation Theory

Credits: 3
Cross-Listed with IT 830

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.

Prerequisites
ECE 528.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

ECE 735 - Data Compression

Credits: 3
Cross-Listed with IT 832

In-depth study of lossy data compression techniques based on vector quantization with application to speech, image, and video signals. Covers vector quantization of signal's waveform and commonly used parametric statistical models such as the autoregressive model. Topics include scalar and predictive quantization, transform and entropy coding, and variations on basic vector quantization such as constrained vector and variable rate vector quantization.

Prerequisites
ECE 528 or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
1

ECE 737 - Spread Spectrum Communications

Credits: 3
Cross-Listed with IT 932
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.

Prerequisites
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
Theory and practice of advanced digital signal processing techniques. Topics include computationally efficient high-speed algorithms for convolution, correlation, orthogonal transforms, multirate processing of digital signals, filter banks, multiresolution time frequency and time-scale analysis of one- and two-dimensional signals, and parallel signal processing.

Prerequisites
ECE 638.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

ECE 739 - Satellite Communications

Credits: 3
Cross-Listed with IT 833

Introduces theory and applications of modern satellite communications. Topics include satellite channel characterization, channel impairments and transmission degradation, link calculations, modulation, coding, multiple access, broadcasting, random access schemes, demand assignment, synchronization, satellite switching and onboard processing, integrated service digital satellite networks, and satellite transponder, ground stations, packet switching, and optical satellite communications.

Prerequisites
ECE 630 or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

ECE 741 - Wireless Networks
Credits: 3
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.

Prerequisites
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
Cross-Listed with IT 834

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.

Prerequisites
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
Cross-Listed with IT 848

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.

Prerequisites
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
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.

**Prerequisites**
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
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.

**Prerequisites**
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
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.
Prerequisites
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
Cross-Listed with IT 844

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 system identification, neural networks for motion control and path planning in robotics, neural network process control, aerospace control problems and neural network autopilot, neural network control of aircraft flare and touchdown, and neural network control of autonomous vehicles.

Prerequisites
ECE 549 and 620.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

ECE 750 - Intelligent Systems for Robots

Credits: 3
Cross-Listed with CS 685/SYST 672/IT 840

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.

Prerequisites
SYST 611, ECE 650, or CS 580; or SYST 555 or equivalent.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

ECE 751 - Information Theory
Cross-Listed with IT 886

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.

Prerequisites
ECE 528 or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

ECE 752 - Spectral Estimation

Cross-Listed with IT 885

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.

Prerequisites
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

Cross-Listed with IT 888

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.

Prerequisites
ECE 734 or SYST 611.

Hours of Lecture or Seminar per week
3
ECE 754 - Optimum Array Processing I

Credits: 3
Cross-Listed with IT 837


Prerequisites
ECE 734.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

ECE 755 - Optimum Array Processing II

Credits: 3
Cross-Listed with IT 937

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.

Prerequisites
IT 837.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

ECE 758 - Networked Virtual Environments

Credits: 3
Cross-Listed with CS 758


Notes
Term project required.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**ECE 780 - High-Frequency Electronics**

Credits: 3

*Cross-Listed with IT 845*

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.

**Prerequisites**
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: 3

Research project to be chosen and completed under guidance of graduate faculty member that results in acceptable technical report.

**Prerequisites**
9 graduate credits.

**Hours of Lecture or Seminar per week**
0

**Hours of Lab or Studio per week**
0

**ECE 799 - Master's Thesis**

Credits: 1-6

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.

**Prerequisites**
9 graduate credits, and permission of instructor.

**Hours of Lecture or Seminar per week**
ECE 836 - Special Topics in Detection and Estimation Theory

Credits: 3
Cross-Listed with IT 836

Advanced topics in detection, estimation, and signal processing in areas of current research interest. Topics may include spectral estimation, speech recognition, array processing, SAR, underwater acoustics, or higher order spectra.

Prerequisites
ECE 734.

ECE 847 - Topics in Photonics

Credits: 3
Cross-Listed with IT 847

In-depth discussion of specific topics in photonics. Includes optical storage (disks, olographic, 3D), digital optical computing, integrated optics, photonic switching networks, and optoelectronic devices.

Prerequisites
ECE 565 or permission of instructor.

Notes
May be repeated with different topics.

ECE 945 - Advanced Topics in Microelectronics

Credits: 3
Cross-Listed with IT 945

Current topics of advanced research in microelectronics. Includes very high-speed integrated circuits, monolithic microwave integrated circuits, optoelectronic integrated circuits, novel device structures, and advances in semiconductor device technology.
**Prerequisites**
IT 845

**Notes**
May be repeated with change in topic.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

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**ECE 998 - Doctoral Dissertation Proposal**

Credits: 1-12
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

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**ECE 999 - Doctoral Dissertation**

Credits: 1-12
Formal record of commitment to doctoral dissertation research under direction of ECE faculty member.

**Prerequisites**
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.

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**ECON 100 - Economics for the Citizen**

Credits: 3
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.

**Hours of Lecture or Seminar per week**
3
ECON 103 - Contemporary Microeconomic Principles

Credits: 3
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.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

ECON 104 - Contemporary Macroeconomic Principles

Credits: 3
Introduces macroeconomics in the context of current problems. National income analysis, money and banking, economic growth and stability, unemployment, inflation, and role of government.

Prerequisites
ECON 103.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

ECON 105 - Environmental Economics for the Citizen

Credits: 3
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.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

ECON 110 - Introduction to Economic Science

Credits: 2
Introduces economics as an observational science, covering personal vs. impersonal exchange, strategic interdependence and
game theory, group decision making, and market design.

Notes
Registration is controlled; contact instructor for guidelines.

Hours of Lecture or Seminar per week
2

Hours of Lab or Studio per week
0

ECON 111 - Laboratory Methods in Economics

Credits: 1
Enables participation in experimental economics research by recruiting subjects, writing experiment instructions, and monitoring sessions.

Notes
Registration is controlled; contact instructor for guidelines.

Hours of Lecture or Seminar per week
0

Hours of Lab or Studio per week
3

ECON 306 - Intermediate Microeconomics

Credits: 3
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.

Prerequisites
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
Analysis of major strategic business situations including pricing strategy, incentives and contracts, game theory, and vertical and horizontal integration.

Prerequisites
ECON 306.
ECON 309 - Economic Problems and Public Policies

Credits: 3
Economic problems in light of current and proposed public policies. Topics include environmental issues, international trade policies, and regulatory issues and their historical roots.

Prerequisites
Completion or concurrent enrollment in all other general education courses, and ECON 103 and 104; or permission of instructor.

ECON 310 - Money and Banking

Credits: 3
Monetary, commercial, and central banking systems, with particular emphasis on their relationship with American government programs, fiscal policies, and controls.

Prerequisites
ECON 103 and 104, or permission of instructor.

ECON 311 - Intermediate Macroeconomics

Credits: 3
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.

Prerequisites
ECON 103 and 104, or permission of instructor.
**ECON 316 - Economic Growth and Business Cycle**

Credits: 3  
Covers factors contributing to sustained economic growth, emphasizing business fluctuations and their measurement.

**Prerequisites**  
ECON 310 or 311, 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  
Explores American labor unions and their effect on society, including causes of and proposed solutions to selected problems.

**Prerequisites**  
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  
Defines factors that determine levels of wages and employment, and economic consequences. Emphasizes recent developments in unionism, collective bargaining, and industrial technology.

**Prerequisites**  
ECON 306.

**Hours of Lecture or Seminar per week**  
3  
**Hours of Lab or Studio per week**  
0

**ECON 330 - Public Finance**

Credits: 3  
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.

**Prerequisites**
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  
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.

**Prerequisites**
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  
Mathematical treatment of theory of firm and household behavior, stabilization policy, growth theory, input-output analysis, and linear programming.

**Prerequisites**
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  
Modern statistical techniques in estimating economic relations.

**Prerequisites**
ECON 306 and 311, and OM 210 or STAT 250.
ECON 350 - Regional and Urban Economics

Credits: 3
Regional development and metropolitan growth, including locational decisions of households and firms, and problems associated with high-density urban economic activity.

Prerequisites
ECON 306 or permission of instructor.

ECON 360 - Economics of Developing Areas

Credits: 3
Economic growth characteristic of developing countries. Economic development, obstacles to development, policies, and planning.

Prerequisites
ECON 103 and 104, or permission of instructor.

ECON 361 - Economic Development of Latin America

Credits: 3
Economic development, institutions, and problems of Latin America.

Prerequisites
ECON 103 and 104, or permission of instructor.

Notes
For non-Western credit.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0
ECON 362 - African Economic Development

Credits: 3
Issues of economic development as applied to Africa. Includes overview of early economic history in Africa and post-independence development, and contemporary development problems.

Prerequisites
ECON 103 and 104.

ECON 365 - Topics in Economic History

Credits: 3
Possible topics include ancient, medieval, modern European, and American economic history, using econometric analysis as necessary.

Prerequisites
ECON 103 and 104.

Notes
Subject matter varies. May be repeated once for credit with permission of instructor.

ECON 370 - Economics of Industrial Organization

Credits: 3
Factors influencing industrial structure, and industrial conduct and performance.

Prerequisites
ECON 306, or permission of instructor.

George Mason University 2009-2010 Official University Catalog
ECON 372 - Economics of E-Commerce

Credits: 3
Examines how institutional rules, transaction costs, and behavior of agents affect performance of electronic marketplaces.

Prerequisites
ECON 103 or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

ECON 375 - Introduction to the Economics of Religion

Credits: 3
Examines the theory of religious markets as they relate to effects, mainstream religion, new religious movements, religious extremism, and religious trends.

Prerequisites
ECON 103.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

ECON 380 - Economies in Transition

Credits: 3
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.

Prerequisites
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
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
Foreign exchange market, balance of payment, foreign trade policies, and theories of international trade.

Prerequisites
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
Microeconomic and macroeconomic models and misallocation of resources.

Prerequisites
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
Applies economic theory, methodology to study nonmarket decision making.

Prerequisites
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
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.

**Prerequisites**
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
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.

**Prerequisites**
ECON 306 or permission of instructor.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

ECON 420 - International Money and Finance

Credits: 3
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.

**Prerequisites**
ECON 306 and 311, or permission of instructor.

**Hours of Lecture or Seminar per week**
3
ECON 440 - Economic Systems Design: Principles and Experiments

Credits: 3
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.

Prerequisites
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
Requires students to design and develop mechanism to specific allocation problem. Students develop analytical and working engineering models of their mechanism.

Prerequisites
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
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.

Prerequisites
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
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.

Prerequisites
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 481 - The Development of Economic Thought

Credits: 3
Developments in economic thought from 1500 to the present. Emphasizes historical origins, impact on contemporary economics, and theoretical validity.

Prerequisites
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
Applies economic tools to investigate problems in economics.

Prerequisites
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 496 - Special Topics in Economics

Credits: 3
Subject matter varies.
Prerequisites
Varies with topic.

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

ECON 498 - Internship

Credits: 1-3
Students find economics-related internship with assistance from Career Services. Pre-internship proposal and final reflections paper required.

Prerequisites
6 upper-level credits of economics, junior standing, and permission of instructor.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
0

ECON 499 - Independent Study

Credits: 1-3
Individual study of selected area of economics.

Prerequisites
Economics majors with 90 credits, and permission of both department and instructor.

Notes
Directed research paper required. May be taken for a maximum of 6 credits. ECON 306 and 311, or equivalent, are prerequisites to all graduate courses except ECON 600 and 602. Undergraduates require special permission to enroll in 600-level courses.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
0

ECON 535 - Survey of Applied Econometrics

Credits: 3
Applied introduction to estimating economic relationships. Includes simple equation and simultaneous equation system estimation.


**Prerequisites**
OM 210, and ECON 306 and 311, or permission of instructor.

**Notes**
Students who take ECON 535 may not take ECON 637 for credit.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**ECON 611 - Microeconomic Theory**

Credits: 3
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.

**Prerequisites**
Admission to master's program in economics, or ECON 306 and 311, and MATH 113; or permission of graduate coordinator.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**ECON 612 - Microeconomic Theory II**

Credits: 3
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.

**Prerequisites**
ECON 611.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**ECON 615 - Macroeconomic Theory**

Credits: 3
Survey course covering monetary theory, theories of consumption and saving, budget deficits, economic growth, international finance, and monetary and fiscal policies.
Prerequisites
Admission to master's program in economics, or ECON 306 and 311, and MATH 108; or permission of graduate coordinator.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

**ECON 623 - American Economic History**

Credits: 3
Explores development of American economy and evolution of economic institutions.

Prerequisites
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
Includes set theory, function, differential calculus, integration, series, and matrix algebra, with special emphasis on economic applications.

Prerequisites
Admission to doctoral or master's program, or 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 632 - Economic Systems Design Principles and Experiments**

Credits: 3
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.

Prerequisites
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

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**ECON 633 - Economic Systems Design Case Studies and Analysis**

Credits: 3  
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.

**Prerequisites**
ECON 632.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

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**ECON 634 - Economic Systems Design Implementation**

Credits: 3  
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.

**Prerequisites**
ECON 633.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

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**ECON 637 - Econometrics I**

Credits: 3  
Techniques of estimating relationships between economic variables. Introduces multiple regression and problems associated with single equation model-autocorrelation, multicollinearity, and heteroscedasticity.

**Prerequisites**
Acceptance to PhD program in economics, OM 210, or permission of instructor.

**Hours of Lecture or Seminar per week**
3
ECON 675 - Economics of Religion I

Credits: 3
Explores the application of economics methods and insights to the exploration of the relationship between religious and socioeconomic behavior, beliefs, and institutions.

Prerequisites
ECON 611, 612, 615, 630, 637.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

ECON 676 - Comparative Economic Systems

Credits: 3
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 715 - Macroeconomic Theory I

Credits: 3
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.

Prerequisites
Admission to doctoral program in economics, or permission of graduate coordinator.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

ECON 811 - Microeconomic Theory I
Credits: 3
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.

Prerequisites
Admission to doctoral program, or permission of graduate coordinator.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

ECON 812 - Microeconomic Theory II

Credits: 3
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.

Prerequisites
ECON 811.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

ECON 816 - Macroeconomic Theory II

Credits: 3
Aggregate economic activity and price levels with emphasis on dynamic models.

Prerequisites
ECON 611 and 715, or permission of instructor.

Notes
Topics vary.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

ECON 817 - Monetary Theory and Policy

Credits: 3
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.

Prerequisites
ECON 615 and 637, or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

ECON 820 - History of Economic Thought

Credits: 3
Explores major figures in history of economic thought and tools of analysis they created. Emphasizes classical, neoclassical, and Keynesian theories.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

ECON 821 - History of Economic Thought II

Credits: 3
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
Offers economic analysis of various historical epochs including Industrial Revolution, evolution of political reform, rise of unions, and growth of government.

Prerequisites
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
Covers economic process of public policy formulation and implementation; and economic behavior of principals in policy making and execution.

Prerequisites
ECON 611, 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
Specific issues related to political economy of public policy, including privatization, political economy of deficit spending, regulation and deregulation, and economics of rent seeking.

Prerequisites
ECON 611, 615, and 825; or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

ECON 827 - Economic Philosophy

Credits: 3
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.

Prerequisites
ECON 611, or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

ECON 828 - Constitutional Economics
Credits: 3
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.

Prerequisites
ECON 611, or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

ECON 829 - Economics of Institutions

Credits: 3
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.

Prerequisites
ECON 611, or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

ECON 831 - Mathematical Economics II

Credits: 3
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.

Prerequisites
ECON 630 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
Explores econometric models and simultaneous equation systems. Includes identifying parameters and least squares bias, alternative estimation methods, and block recursive systems.
**Prerequisites**
ECON 637 or permission of instructor.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**ECON 840 - Law and Economics I**

Credits: 3
Uses economics to analyze U.S. Common-law system, evaluating efficiency and logic of evolution.

**Prerequisites**
ECON 611, 630, 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
Explores empirical analyses of law of property, torts, crime, and family. Also looks at law's effects on freedom and economic growth.

**Prerequisites**
ECON 840.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**ECON 842 - Labor Economics**

Credits: 3
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.

**Prerequisites**
ECON 611 and 615, 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
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.

**Prerequisites**
ECON 611 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
Covers relationship of law, economics, and theories of social control of property rights. Includes theories of market structure and industrial performance.

**Prerequisites**
ECON 611 and 844.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

### ECON 849 - Public Finance

**Credits:** 3
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.

**Prerequisites**
ECON 611 or permission of instructor.
ECON 852 - Public Choice I

Credits: 3
Applies economic theory and methodology to study of nonmarket decision making.

Prerequisites
ECON 611 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
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.

Prerequisites
ECON 611 or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

ECON 856 - Urban and Regional Economics

Credits: 3
Regional development and metropolitan growth economics including locational decisions of households and firms, and problems associated with high-density urban economic activity.

Prerequisites
ECON 611 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
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
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.

Prerequisites
ECON 611 and 615, 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
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.

Prerequisites
ECON 611 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
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.

**Prerequisites**
ECON 615 or permission of instructor.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**ECON 875 - Economics of Religion II**

Credits: 3
Studies the relationship between religion and economies as it addresses a wide range of empirical questions concerning the causes and consequences of religious commitment. Issues addressed include the relationship between religious and political conservatism, correlates of socioeconomic factors and religious outcomes, and the contributions of religion to development, political liberty, and civil rights.

**Prerequisites**
ECON 611, 630, 637, 812.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**ECON 880 - Austrian Theory of the Market Process I**

Credits: 3
Examines theory developed by Menger, Mises, Hayek, and others of the Austrian School; and compares with other popular theories.

**Prerequisites**
ECON 611.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**ECON 881 - Austrian Theory of Market Process II**

Credits: 3
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.

**Prerequisites**
ECON 611 and 615; ECON 880 recommended.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**ECON 885 - Experimental Economics**

Credits: 3

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.

**Prerequisites**

ECON 611 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

Research in experimental design. Topics represent basic tools to build, test, and implement exchange mechanisms in an applied setting.

**Prerequisites**

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

Topics vary according to interests of instructor. Emphasizes new areas of discipline.

**Notes**

May be repeated for credit as topics vary.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0
ECON 896 - Directed Reading and Research

Credits: 3
Independent reading and research paper on a topic agreed on by student and faculty member.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
0

ECON 918 - Seminar in Monetary Theory and Policy

Credits: 3
Selected topics of current interest.

Prerequisites
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
Important public finance issues treated in seminar format.

Prerequisites
ECON 611 and 849.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

ECON 975 - Workshop in Religion and Economics

Credits: 3
Topics vary, according to interests of instructor. Emphasizes new areas of discipline.

Prerequisites
ECON 675, 875.
Notes
May be repeated for credit as topics vary.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

**ECON 985 - Workshop in Experimental Economics**

Credits: 3
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.

Prerequisites
ECON 885, 886.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

**ECON 998 - Doctoral Dissertation Proposal Research.**

Research on prospective dissertation topic.

Notes
For students who have completed course work but have not yet advanced to candidacy.

Grading
S/NC

**ECON 999 - Doctoral Dissertation Research**

Credits: variable
Research on approved dissertation topic under direction of dissertation committee.

Prerequisites
Admission to PhD economics program, and permission of dissertation advisor.

Notes
May be repeated; 24 credits may be applied to doctoral degree requirement.

Grading
S/NC
EDAE 600 - Alternative Education for At-Risk Youth

Credits: 1
Overview of the nature of at-risk students, why alternative education programs exist, and the types of alternative programs available locally, statewide, and nationally.

Hours of Lecture or Seminar per week
1

Hours of Lab or Studio per week
0

EDAE 601 - Curriculum and Methods in Alternative Education

Credits: 3
Identifies and develops expertise in various instructional strategies, adaptations, and modifications used with at-risk students in the context of alternative education environments. Emphasizes motivation, scheduling, standards of learning, and technology.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

EDAE 602 - Preparing Students for Employment and Living Independently

Credits: 2
Explores postsecondary options and opportunities for at-risk students in alternative programs. Covers integration of career development, passing the GED, individual transition plans, obtaining employment, using technology, and locating resources.

Hours of Lecture or Seminar per week
2

Hours of Lab or Studio per week
0

EDAE 603 - Communication and Management Strategies for Alternative Education

Credits: 3
Focuses on techniques to manage crisis management, resolve conflicts, implement peer mediation, and develop positive peer and adult relationships. Emphasizes strategies for working successfully with families, diverse populations, substance abusers, and dually diagnosed students.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0
EDAE 604 - Multidisciplinary and Interagency Collaboration

Credits: 3
Examines the Comprehensive Services Act of Virginia and other legislation concerning at-risk youth. Emphasizes agency functions, case management, collaboration, identifying resources, and networking.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

EDAL 541 - Understanding Adult Learners

Credits: 6
Examines a variety of adult learning issues, including theory, developmental psychology, and motivation and experience. Adult learners are considered in terms of individual learning needs, incentives, support systems, and learning style differences.

Hours of Lecture or Seminar per week
6

Hours of Lab or Studio per week
0

EDAL 542 - Arranging Conditions for Adult Learning

Credits: 6
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

EDCD 500 - In-Service Educational Development

Credits: 1-6
Offered at request of school division or other educational agency.

Prerequisites
Employment in professional capacity by sponsoring division or agency.

Notes
Content varies; may be repeated for credit.
EDCD 525 - Advanced Human Growth and Development

Credits: 3
Covers human development throughout the life span, including emotional, physical, and cognitive development; and emphasizes personal adjustment and achievement.

EDCD 597 - Special Topics in Education

Credits: 1-6
Provides advanced study on selected topic or emerging issue in American or international education.

Prerequisites
Admission to program in Graduate School of Education.

Notes
May be repeated for credit with GSE permission.

EDCD 598 - Directed Reading, Research, and Individual Projects

Credits: 1-6
Presents various subjects and projects, principally by directed study, discussion, research, and participation under supervision of graduate faculty member.

Prerequisites
Admission to degree program and permission of dean.

Notes
May be repeated for up to 12 credits.
EDCD 599 - Thesis

Credits: 6
Study of problem of significant interest to student using accepted research methods and under supervision of graduate faculty member.

EDCD 600 - Workshop in Education

Credits: 1-6
Offers full-time workshops and weekend seminars on selected topics in education and education tour seminars.

Notes
May be repeated for credit.

EDCD 601 - Introduction to Research in Counseling

Credits: 3
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.

EDCD 602 - Foundations in Counseling

Credits: 3
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.
EDCD 603 - Counseling Theories and Practice

Credits: 3
Covers major theoretical approaches to counseling from a multicultural perspective and provides supervised introduction to basic skills.

Prerequisites
Admission to CNDV program; EDCD 602 (course may be taken concurrently).

EDCD 604 - Assessment and Appraisal in Counseling

Credits: 3
Prepares students to become informed about psychological and educational tests and assessment procedures that are used and applied in a counseling context.

Prerequisites
Admission to CNDV program, EDCD 525, and EDCD 601.

EDCD 606 - Counseling Children and Adolescents

Credits: 4
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.

Prerequisites
Admission to CNDV program, EDCD 525 and EDCD 603
EDCD 608 - Group Processes and Analyses

Credits: 4
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.

Prerequisites
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
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.

Prerequisites
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
Presents theories and counseling issues relevant to career counseling in schools and community agencies.

Prerequisites
Admission to CNDV program; EDCD 525; and EDCD 604 (course may be taken concurrently).

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
Introduces principles, practices, and application of ethical and legal issues in school counseling.

Prerequisites
Admission to counseling and development program and EDCD 602.

Prerequisites/Corequisites
Prerequisite or corequisite: EDCD 626.

EDCD 616 - Counseling Skills in International Schools

Credits: 3
Introduces skills applicable to international school settings. Students study, discuss, and develop skills with emphasis on multicultural counseling and multiethnic student populations.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

EDCD 617 - Group Counseling in International Schools

Credits: 3
Discusses group counseling in context of international schools and multicultural counseling, describing types of groups, group counseling practices, methods, group dynamics, and facilitation skills. Attention to applying theory to practice.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

EDCD 618 - Principles and Practices of Counseling in International Schools

Credits: 3
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 619 - Multicultural Counseling in International Schools

Credits: 3
Covers issues, characteristics, skills, and needs relevant to internationally diverse populations in the international school context.

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
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
Introduces school counseling program development at K-12 levels. Presents philosophy, principles, and practices of effective school counseling.

Prerequisites
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 628 - Counseling and Social Justice

Credits: 3
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.

Prerequisites
Admission to CNDV program, EDCD 603, and EDCD 626 or EDCD 654.

Hours of Lecture or Seminar per week
EDCD 631 - Ethical and Legal Issues in Counseling

Credits: 3
Covers principles, practices, and application of ethics and law in counseling.

Prerequisites
Admission to counseling and development program and EDCD 605, or postgraduate counseling students by permission of program coordinator or instructor.

EDCD 652 - Introduction to Substance Abuse Counseling

Credits: 3
Introduces substance abuse counseling. Covers addiction issues, diagnosis and treatment planning, and individual and group counseling strategies with diverse populations.

Prerequisites/Corequisites
Prerequisites or corequisites: admission to counseling and development program, EDCD 603.

EDCD 654 - Counseling, Ethics, and Consultation in Community Agencies

Credits: 3
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.

Prerequisites/Corequisites
Prerequisites or corequisites: admission to counseling and development program, EDCD 603.
EDCD 656 - Diagnosis and Treatment Planning for Mental Health Professionals

Credits: 3
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.

Prerequisites
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
Introduces major approaches to counseling couples and families. Uses case studies and simulations to facilitate transition from theory to practice.

Prerequisites
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 660 - Multicultural Counseling

Credits: 3
Covers counseling from a multicultural perspective. Explores counseling issues for diverse populations with a focus on ethnicity and race.

Prerequisites
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
Provides supervised practice in counseling setting similar to setting in which student may work. Weekly graduate class
emphasizes site processing.

**Prerequisites**
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**

Credits: 3
Provides supervised practice for a 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.

**Prerequisites**
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.

**Notes**
Weekly graduate class emphasizes site processing.

**Hours of Lecture or Seminar per week**
0

**Hours of Lab or Studio per week**
3

**EDCD 790 - Internship in Counseling and Development**

Credits: 3-6
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.

**Prerequisites**
Completion of CNDV program except for internship; permission of advisor; overall GPA of 3.00; no grade of C in any skills courses EDCD 605, 607, 608, 610, and 754; 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
EDCD 791 - Internship in Counseling

Credits: 3
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.

Prerequisites
Completion of CNDV program course work except for electives (total credits cannot exceed 3 credits) and internship; permission of advisor; overall GPA of 3.00; no grade lower than B in skills courses EDCD 603, 606, 608, 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
0
Hours of Lab or Studio per week
3

EDCD 797 - Advanced Topics in Education

Credits: 1-6
See EDUC 797.

Prerequisites
Admission to CNDV program or permission of instructor.

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
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.

Prerequisites
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
Focuses on advanced issues in multicultural counseling, including multicultural counseling theories, skills, assessment, supervision, research, and ethics.

Prerequisites
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

EDCD 897 - Advanced Group Counseling

Credits: 3
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.

Prerequisites
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

EDCD 898 - Grant Writing and Publishing

Credits: 3
Focuses on grant writing and publishing in counseling and psychology.

Prerequisites
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

EDCD 990 - Advanced Internship in Counseling Leadership

Credits: 3
Provides supervised practice in counseling leadership setting or position. Emphasizes counseling leadership in practice.
Prerequisites
Admission to counseling and development PhD specialization, EDCD 895, and EDCD 628 or equivalent.

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
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.

Prerequisites
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
Provides opportunities to implement programs and strategies to affect social justice for clients in school or community settings.

Prerequisites
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

EDCE 600 - Philosophical and Theoretical Perspectives on Character Education

Credits: 3
Analyzes and evaluates theories and models of character education that fit with different philosophical perspectives. Analyzes character education in the United States and other countries.
**EDCE 601 - How Students Learn Values and Ethics**

Credits: 3  
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.

**Prerequisites**  
Admission to Character Education Program.

**EDCE 602 - Comprehensive Character Education Frameworks**

Credits: 3  
Analyzes comprehensive character education frameworks that have emerged from research and practice, examining framework components and their applications to character education initiatives.

**Prerequisites**  
Admission to Character Education Program.

**EDCE 603 - Global and Ethical Perspectives on Teaching Diverse Learners**

Credits: 3  
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.

**Prerequisites**  
Admission to Character Education Program.
EDCE 604 - Character Education Curriculum and Programs

Credits: 3
Analyzes and evaluates quality of programs and curriculum materials for character education using program, implementation, and curriculum standards.

Prerequisites
Admission to Character Education Program.

EDCE 605 - Character Education Assessment and Evaluation

Credits: 3
Applies assessment standards and audit tools to analyze and evaluate formative and summative assessments of programs for character education. Utilizes backward design model.

Prerequisites
EDCE 602, 603, and 604.

EDCE 606 - Leadership in Character Education: An Internship in Program Development, Curriculum, Instruction, or Assessment

Credits: 3
A 150-hour, on-site internship focusing on one of the following: instructional strategies, curriculum or program development, using resources, or assessment.

Prerequisites
EDCE 602, 603, 604, and 605.
EDCE 607 - Educational Research for Character Educators

Credits: 3
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.

Prerequisites
EDCE 600, 601, 602, 603, and 604.

Prerequisites/Corequisites
Prerequisite or corequisite: EDCE 605.

Hours of Lecture or Seminar per week
3

EDCI 370 - Young Adult Literature in Multicultural Settings

Credits: 3
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

EDCI 372 - Teaching Mathematics in the Secondary School

Credits: 3
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
EDUC 422

Hours of Lecture or Seminar per week
3
EDCI 473 - Teaching Science in the Secondary School

Credits: 3
Builds fundamental knowledge of science teaching and learning including standards-based curriculum design and research-based teaching strategies.

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
Guides students in working effectively with national and local standards for teaching secondary English. Continuation course in methods from 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
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.

Prerequisites
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
Provides intensive, supervised clinical experience in approved school for fall or spring semester.

Prerequisites/Corequisites
Completion of licensure and all endorsement course work
EDCI 500 - In-Service Educational Development

Credits: 1-6
Offered at request of school division or other educational agency.

Prerequisites
Employment in professional capacity by sponsoring division or agency.

Notes
Content varies; may be repeated for credit.

EDCI 510 - Linguistics for PreK-12 ESOL Teachers

Credits: 3
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.

EDCI 511 - Developing Curriculum and Designing Instruction in Early Childhood Education

Credits: 3
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.
**EDCI 516 - Bilingualism and Language Acquisition Research**

Credits: 3

Examines research in first and second language acquisition, including interaction of bilingual person's two languages, with applications for classroom.

**Notes**
School-based field experience required.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**EDCI 519 - Methods of Teaching Multilingual Students**

Credits: 3

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.

**Prerequisites**
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

**EDCI 520 - Assessment of Language Learners**

Credits: 3

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.

**Prerequisites**
EDCI 516 and 519.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0
EDCI 521 - Curriculum Development for Language Learners

Credits: 3
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.

Prerequisites
EDCI 516 and 519.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

EDCI 544 - Curriculum and Methods of Teaching in Elementary Education

Credits: 3
Introduction to general methods of teaching in elementary schools focusing on planning, teaching strategies, management, assessment, and differentiation.

Prerequisites
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
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.

Prerequisites
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

Credits: 1
Studies the development and integration of technology in the elementary education literacy curriculum.

Prerequisites
Admission into elementary education graduate program.

Corequisite
EDCI 556.

Hours of Lecture or Seminar per week
1

Hours of Lab or Studio per week
0

EDCI 547 - Integrating Technology in Elementary Classrooms: Mathematics

Credits: 1
Studies the development and integration of technology in the elementary education mathematics curriculum.

Prerequisites
Admission into elementary education graduate program.

Corequisite
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
Studies the development and integration in the elementary education social studies and fine arts curriculum.

Prerequisites
Admission into elementary education graduate program.

Corequisite
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
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
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.

Prerequisites
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

EDCI 553 - Science Methods for the Elementary Classroom

Credits: 1-3
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.

Prerequisites
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
EDCI 554 - Methods of Teaching Social Studies and Integrating Fine Arts in the Elementary Classroom

Credits: 3
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.

Prerequisites
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

EDCI 555 - Literacy Teaching and Learning in Diverse Elementary Classrooms I

Credits: 3
Provides research-based introduction to literacy teaching and learning for younger children. Emphasizes language development; reading and writing processes; emergent literacy; culture, families, and literacy; and literacy integration in the curriculum.

Prerequisites
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 556 - Literacy Teaching and Learning in Diverse Elementary Classrooms II

Credits: 1-3
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.

Prerequisites
Admission to elementary education licensure program

Notes
School-based field experience required.

Hours of Lecture or Seminar per week
1-3
EDCI 557 - Integrating Technology in the Elementary Curriculum

Credits: 3
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.

Prerequisites
Admission to elementary education licensure program

Notes
School-based field experience required.

EDCI 558 - Integrating Fine Arts and Movement in Elementary Education

Credits: 3
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.

Prerequisites
Admission to PDS or Partnership Elementary Licensure Program.

Notes
School-based field experience required.

EDCI 559 - Research and Assessment in Elementary Education

Credits: 3
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.

Prerequisites
Admission into elementary education graduate program; capstone course for degree must be taken last in programmatic
EDCI 560 - Methods of Teaching in Foreign/World Languages

Credits: 3
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.

Prerequisites
EDCI 516, or current teaching position.

Notes
Requires field experience in schools.

EDCI 567 - Teaching Social Studies in the Secondary School

Credits: 3
Advanced course in methods, materials, content, and organization of social studies programs in secondary schools.

Prerequisites/Corequisites
Prerequisite or corequisite: EDUC 522.

Notes
Requires field experience for those seeking initial teacher licensure.

EDCI 569 - Teaching English in the Secondary School

Credits: 3
Provides study of advanced methods, materials, content, and organization of English programs in secondary school.

Prerequisites
EDUC 522.
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 570 - Teaching Young Adult Literacy in a Multicultural Setting

Credits: 3
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
Emphasizes developing different styles of teaching.

Prerequisites
EDUC 522. Covers curricula, current issues, and research literature in secondary school mathematics.

Notes
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
Provides study of methods, materials, content, and organization of science programs. Emphasizes curriculum planning, current methodologies, safety, and trends in secondary schools.

Prerequisites
EDUC 522.

Notes
Requires school-based field experience for those seeking initial teacher licensure.
EDCI 577 - Curriculum and Methods of Teaching, PK-12

Credits: 3
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.

EDCI 597 - Special Topics in Education

Credits: 1-6
Provides advanced study on selected topic or emerging issue in American or international education.

Prerequisites
Admission to program in GSE.

Notes
May be repeated for credit with GSE permission.

EDCI 600 - Workshop in Education

Credits: 1-6
Offers full-time workshops and weekend seminars on selected topics in education and education tour seminars.

Notes
May be repeated for credit.
EDCI 601 - Applied Study of Communicative Competence and Classroom Discourse

Credits: 3
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
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.

Prerequisites
Admission to GSED.

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
Examines trends, issues, research findings, and resulting program development.

Prerequisites
Admission to GSED, and EDRS 590.

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
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.
EDCI 614 - Curriculum and Assessment in Early Childhood Education II

Credits: 3
Second of two-course sequence focusing on planning and assessing children's knowledge of content and subject matter. Emphasizes action research.

EDCI 615 - Advanced Human Development

Credits: 3
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.

EDCI 616 - The Creative Arts and Play in Early Childhood Education

Credits: 3
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.

EDCI 621 - Introduction to Gifted and Talented Learners

Credits: 3
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.
EDCI 622 - Curriculum Differentiation for Diverse Learners

Credits: 3
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.

EDCI 623 - Models and Strategies for Teaching Gifted Learners

Credits: 3
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.

EDCI 624 - Assessment, Identification, and Evaluation of Gifted Learners

Credits: 3
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.

EDCI 625 - Contemporary Issues and Trends in Gifted Education

Credits: 3
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.

**Prerequisites**
EDCI 621, 622, 623, 624.

**Hours of Lecture or Seminar per week**
3

**EDCI 626 - Action Research in Gifted Education**

Credits: 3
Opportunity to identify and investigate school-based problem and apply inquiry, writing, and research skills to relevant issue or concern in gifted education.

**Hours of Lecture or Seminar per week**
3

**EDCI 627 - Advanced Practicum in Gifted Education**

Credits: 3
Intensive supervised clinical experiences for one semester in accredited elementary or secondary school. Students supervised in setting that includes scheduled observations and seminar experiences.

**Prerequisites**
EDCI 621, 622, 623, 624.

**Hours of Lecture or Seminar per week**
3

**EDCI 631 - Research in Elementary Education**

Credits: 3
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.

**Prerequisites**
Completion of elementary education (PK-6) licensure.

**Hours of Lecture or Seminar per week**
3
EDCI 632 - Advanced Social Studies Methods for the Elementary Classroom

Credits: 3
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.

Prerequisites
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
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.

Prerequisites
Completion of elementary education (PK-6) licensure, and EDCI 631.

Notes
Requires field experience in public schools.

EDCI 634 - Advanced Science Methods for the Elementary Classroom

Credits: 3
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.
**EDCI 635 - Applied Research in Elementary Education**

Credits: 3
Helps beginning teachers plan and complete action research project related to teaching assignment. Students apply research methods explored during prerequisite series of courses.

**Prerequisites**
Completion of elementary education (PK-6) licensure; and EDCI 631, 632, 633, and 634.

**EDCI 644 - Mathematics Learning and Assessment (K-8)**

Credits: 3
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.

**Prerequisites**
Admission to the MEd in Education Leadership Mathematics Education Leadership concentration

**EDCI 645 - Curriculum Development in Mathematics Education**

Credits: 3
Analysis, design, and evaluation of school mathematics curricula.

**Prerequisites**
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.

**EDCI 646 - Mathematics Education Leadership for School Change**

Credits: 1-3  
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.

**Prerequisites**  
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.

**EDCI 663 - Research in Science Teaching**

Credits: 3  
Investigates the research and methodology involved in teaching and learning biological, chemical, physical, and earth sciences from K-12.

**Prerequisites**  
Course in teaching science in elementary school, or permission of instructor.

**EDCI 666 - Research in Mathematics Teaching**

Credits: 3  
Explores curricula, current issues, and research literature in elementary school mathematics. Emphasizes development of different styles of teaching.

**Hours of Lecture or Seminar per week**  
3  
**Hours of Lab or Studio per week**  
0
EDCI 667 - Advanced Methods of Teaching Social Sciences in the Secondary School

Credits: 3
Emphasizes interdisciplinary curriculum and instruction, implementing national state standards, authentic assessment, and adaptations for diverse populations.

Prerequisites
EDCI 567.

Notes
School-based field experience required.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

EDCI 669 - Advanced Methods of Teaching English in the Secondary School

Credits: 3
Continuation course in methods (See EDCI 569). Guides students in working effectively with national and local standards for teaching secondary English.

Prerequisites
EDUC 522 and EDCI 569

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

EDCI 672 - Advanced Methods of Teaching Mathematics in the Secondary School

Credits: 3
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.

Prerequisites
EDCI 572.

Notes
School-based field experience required.
EDCI 673 - Advanced Methods of Teaching Science in the Secondary School

Credits: 3
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.

Prerequisites
EDCI 573.

Notes
School-based field experience required.

EDCI 677 - Advanced Curriculum and Methods of Teaching, Secondary

Credits: 3
Includes application of skills in discipline-specific methodology, communication, classroom management, and evaluation of student performance appropriate to elementary level.

Prerequisites
EDCI 577.

Notes
Extends principles of teaching and learning introduced in EDCI 577.

EDCI 678 - Advanced Curriculum and Methods of Teaching, Elementary

Credits: 3
Includes application of skills in discipline-specific methodology, communication, classroom management, and evaluation of student performance appropriate to elementary level.

Prerequisites/Corequisites
Prerequisite or corequisite: 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
Advanced course in science curriculum design and development. Emphasizes instructional materials and assessment.

Prerequisites
EDCI 663, or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

EDCI 684 - Advanced Methods of Teaching Foreign/Second Languages in PK-12 Schools

Credits: 3
Blends theoretical knowledge and practical application. Provides advanced study of second language pedagogy and teaching trends. Topics include multiple learning styles, alternative forms and assessment, and teaching diverse populations.

Prerequisites
EDCI 516, or current teaching position.

Notes
Requires field experience.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

EDCI 693 - Leadership and Organizational Issues in Science Education

Credits: 3
Advanced course in current issues for leadership in science education. Emphasizes technology, safety, professional development, and related organizational change issues.

Prerequisites
EDCI 663 and 683, or permission of instructor.
EDCI 705 - Instructional Design

Credits: 3
Cross-Listed with EDIT 705

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.

Prerequisites
Teaching experience.

EDCI 710 - Technology and the Culture of Schools

Credits: 3
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
EDIT 711.

EDCI 712 - Technology and Learning

Credits: 3
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**
EDIT 713.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**EDCI 714 - Methods of Integration**

Credits: 3
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**
EDIT 715. Considers curriculum design strategies that facilitate technology integration.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**EDCI 716 - Principles of Technology Leadership**

Credits: 3
Focuses on the relationship of leadership, change, and technology advocacy with emphasis on leadership roles for technology educators.

**Corequisite**
EDIT 719

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**EDCI 725 - National and International Leadership Issues in Mathematics Education**

Credits: 3
Students study research on mathematics teaching and learning, including current issues and trends in mathematics education leadership at national and international levels.

**Prerequisites**
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

EDCI 726 - State and Local Leadership Issues in Mathematics Education

Credits: 3
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.

Prerequisites
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

EDCI 777 - Research to Practice

Credits: 3
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.

Prerequisites
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

EDCI 784 - Capstone Seminar in Early Childhood Education

Credits: 3
Culminating seminar devoted to analyzing and synthesizing knowledge and skills gained through graduate course work as it applies to early childhood education.
EDCI 790 - Internship in Education

Credits: 1-6
Intensive, supervised clinical experience for full semester in accredited school. Students must register for appropriate section.

Prerequisites
Passing scores on Praxis I and II, ESL Praxis I only, and permission of advisor.

EDCI 795 - Science Education Research

Credits: 3
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.

Prerequisites
EDCI 891.

EDCI 796 - Science Education Curriculum

Credits: 3
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.

Prerequisites
EDCI 891.
EDCI 797 - Advanced Topics in Education

Credits: 1-6
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

EDCI 855 - Mathematics Education Research on Teaching and Learning

Credits: 3
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.

Prerequisites
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

EDCI 856 - Mathematics Education Curriculum Design and Evaluation

Credits: 3
Students engage in research, analysis, design, and evaluate school mathematics curricula.

Prerequisites
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
EDCI 857 - Preparation and Professional Development of Mathematics Teachers

Credits: 3
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.

Prerequisites
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

EDCI 858 - Mathematics Education Research Design and Evaluation

Credits: 3
Students review methods of research appropriate for mathematics education settings and develop theoretical framework and action plan for conducting research project.

Prerequisites
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

EDCI 891 - Science Teaching and Learning

Credits: 3
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
EDCI 892 - Science Education History and Research

Credits: 3
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.

Prerequisites
EDCI 891.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

EDCI 893 - Science Education Staff Development

Credits: 3
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.

Prerequisites
EDCI 891.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

EDCI 894 - Science Education Leadership and Policy

Credits: 3
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.

Prerequisites
EDCI 891.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0
EDCI 895 - Emerging Issues in Curriculum and Instruction

Credits: 3
Covers issues in curriculum and instruction through individual and group research, discussion, writing, and presentations by experts. Students conduct critical analysis of specific field.

Prerequisites
Admission to PhD program, or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

EDEP 401 - Introduction to Multimedia/Hypermedia

Credits: 3
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

EDEP 402 - Brain, Behavior, and Neuroimaging in Children

Credits: 3
Focus on research regarding the development of cognitive processes in children, their neurobiological substrates, and the imaging technology used to explore the functioning brain.

Prerequisites
At least junior standing or sophomore honors/university scholar candidate.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

EDEP 550 - Theories of Learning and Cognition

Credits: 3
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
**EDEP 551 - Principles of Learner Motivation**

Credits: 3  
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 601 - Creativity and Cognition in the Arts and Media**

Credits: 3  
*Cross-Listed with AVT 606*  
Focuses on research on cognition, development, learning, and creativity in the visual arts and media in formal and informal educational settings.

**Hours of Lecture or Seminar per week**  
0

**EDEP 650 - High-Stakes Assessment and Accountability Systems**

Credits: 3  
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 - Test Design and Interpretation**

Credits: 3  
Focuses on test design and interpretation including issues regarding test development, administration, interpretation, and communication of results. Addresses issues in educational policy, philosophy, and ethics pertaining to assessment and testing.

**Hours of Lecture or Seminar per week**
EDEP 652 - Process of Learning and Development

Credits: 3
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.

Prerequisites
EDEP 550.

EDEP 653 - Culture and Intelligence

Credits: 3
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.

EDEP 654 - Learning, Motivation, and Self-Regulation

Credits: 3
Focuses on theories and research on self-regulation of academic learning. Presents multidimensional conceptual framework for studying and applying self-regulation in educational contexts.

Prerequisites
EDEP 550, 551.

EDEP 820 - Teaching, Learning, and Cognition
Credits: 3  
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.

**Prerequisites**  
EDUC 800, 805; EDLE 802; and EDRS 810.

**Hours of Lecture or Seminar per week**  
3

**Hours of Lab or Studio per week**  
0

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**EDEP 821 - Sociocultural Processes in Learning, Instruction, and Motivation**

Credits: 3  
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.

**Prerequisites**  
EDUC 800, 805; EDLE 802; and EDRS 810.

**Hours of Lecture or Seminar per week**  
3

**Hours of Lab or Studio per week**  
0

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**EDEP 822 - Advanced Learning, Motivation, and Self-Regulation**

Credits: 3  
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.

**Prerequisites**  
EDUC 800, 805; EDLE 802; and EDRS 810.

**Hours of Lecture or Seminar per week**  
3

**Hours of Lab or Studio per week**  
0

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**EDEP 823 - Research Project in Educational Psychology: Sequence I**

Credits: 3  
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.

**Prerequisites**
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
Focuses on development and implementation of research studies in educational psychology. Students acquire skills regarding collecting, analyzing, and interpreting data.

Prerequisites
EDEP 823.

Notes
Second in two course sequence.

EDIT 401 - Introduction to Multimedia/Hypermedia

Credits: 3
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
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.
EDIT 412 - Assistive Technology for Individuals with Sensory Impairments

Credits: 2
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.

Prerequisites
EDIT 410.

Notes
Class components may be delivered via distance education.

EDIT 413 - Technology, Society, and the Culture of Learning

Credits: 3
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.

Prerequisites
EDUC 300.

EDIT 423 - Accessibility/Input Modifications

Credits: 2
Explores accessibility/input devices and strategies used by individuals with disabilities for accessing computers, independent living aids, driving equipment, and communication devices.

Prerequisites
EDIT 410.

Notes
EDIT 425 - Software for Individuals with Special Needs

Credits: 2
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.

Prerequisites
EDSE 410.

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
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
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.

Prerequisites
EDIT 410.
EDIT 504 - Introduction to Educational Technology

Credits: 3
Examines uses of and issues in educational technology. Explores curriculum integration of technology, and focuses on learning and using commercially available applications software.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

EDIT 510 - Introduction to Assistive Technology

Credits: 3
Cross-Listed with EDSE 510

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.

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
Cross-Listed with EDSE 522

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.

Hours of Lecture or Seminar per week
2-3

Hours of Lab or Studio per week
0
EDIT 523 - Accessibility/Input Modification

Credits: 1-3
Cross-Listed with EDSE 523

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.

Hours of Lecture or Seminar per week
1-3

Hours of Lab or Studio per week
0

EDIT 524 - Assistive Technology for Individuals with Learning Disabilities

Credits: 2
Cross-Listed with EDSE 524

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.

Hours of Lecture or Seminar per week
2

Hours of Lab or Studio per week
0

EDIT 525 - Software for Individuals with Special Needs

Credits: 1-2
Cross-Listed with EDSE 525

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.

Hours of Lecture or Seminar per week
1-2

Hours of Lab or Studio per week
0

EDIT 526 - Web Accessibility and Design
Credits: 3
Develops understanding of principles of universal web design. Students apply this understanding by designing and developing accessible web site using web authoring tools.

**EDIT 529 - Internet as an Assistive Technology Tool**

Credits: 2
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.

**Prerequisites**
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
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
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
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
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
Develops expertise with social, cognitive, and learning implications of film, video, and television. Engages students in process of planning, storyboarding, and filming with video.

Hours of Lecture or Seminar per week
2

Hours of Lab or Studio per week
0

EDIT 565 - Teaching with Educational Software

Credits: 1
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
EDIT 566 - Teaching with Multimedia/Hypermedia

Credits: 2
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.

Prerequisites
EDIT 563.

Hours of Lecture or Seminar per week
2
Hours of Lab or Studio per week
0

EDIT 567 - Teaching with Desktop Publishing

Credits: 2
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.

Prerequisites
EDIT 563.

Hours of Lecture or Seminar per week
2
Hours of Lab or Studio per week
0

EDIT 568 - Teaching with the Web

Credits: 2
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.

Prerequisites
EDIT 561

Hours of Lecture or Seminar per week
0

EDIT 571 - Tools for Visual/Graphic Design
Credits: 1-3
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
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
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.

**EDIT 574 - Networking Tools**

Credits: 1-3
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.

**EDIT 575 - Authoring Tools**
Credits: 1-3
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 575-A - Authoring Tools: Authorware

Credits: 1-3
Teaches fundamentals of Authorware program, which can be very complex. Only the essential functions are used for this course. Students develop basic, self-directed design module that includes major components of software covered. Provides core foundations for developing computer-based instructions.

Notes
Students can apply concepts to other authoring tools.

Hours of Lecture or Seminar per week
1-3
Hours of Lab or Studio per week
0

EDIT 575-B - Authoring Tools: Toolbook

Credits: 1-3
Introduces object-oriented construction and authoring with Asymetrix's Multimedia Toolbook. Through hands-on lab instruction, students learn Toolbook's interface. Teaches advanced concepts of importing video and audio clips, resource management, object-linked and embedding, and path-based animation. Introduces basic scripting theories to prepare students for next level of Toolbook authoring.

Notes
Students may apply concepts taught to other authoring tools.

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
Focuses on developing skills, insights, and understanding basics to performing research with emphasis on interpretation,
Students develop expertise in action research methodology, design, and implementation.

**EDIT 593 - Instructional Hardware Systems**

Credits: 3  
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  
Provides advanced study on selected topic or emerging issue in American or international education.

**Prerequisites**  
Admission to program in GSE.

**Notes**  
May be repeated for credit with GSE permission.

**EDIT 601 - Instructional Design and Development (IDD) Portfolio**

Credits: 1  
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
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
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
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.

Prerequisites/Corequisites
Prerequisite or corequisite: EDIT 641.

EDIT 643 - Online Mentoring I: Building Virtual Relationships

Credits: 1
Assists in developing online mentoring skills related to integral role that building relationships plays in success of online
Prerequisites/Corequisites
Prerequisite or corequisite: EDIT 642.

Hours of Lecture or Seminar per week
1

EDIT 644 - Online Mentoring II: Promoting Self-Regulation

Credits: 1
Assists in developing online mentoring skills related to integral role that self-regulation plays in success of online learning.

Prerequisites/Corequisites
Prerequisite or corequisite: EDIT 643.

Hours of Lecture or Seminar per week
1

EDIT 645 - Online Mentoring III: Conceptual Learning

Credits: 1
Assists in developing online mentoring skills related to role of support of conceptual and content understanding in success of online learning.

Prerequisites/Corequisites
Prerequisite or corequisite: EDIT 644.

Hours of Lecture or Seminar per week
1

EDIT 646 - Online Mentoring IV: Moderating

Credits: 2
Assists in developing expertise with moderating student learning asynchronous and synchronous in online environments including discussion boards, chat rooms, and general communication patterns.

Prerequisites/Corequisites
Prerequisite or corequisite: EDIT 645 or permission of instructor.
EDIT 701 - Advanced Instructional Design and Development (IDD) Portfolio

Credits: 1
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.

Prerequisites
EDIT 601.

EDIT 704 - Instructional Technology Foundations and Theories of Learning

Credits: 3
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.

EDIT 705 - Instructional Design

Credits: 3
Cross-Listed with EDCI 705
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.

Prerequisites
Teaching experience.
EDIT 711 - Teaching with Technology I: Telecommunications and Databases

Credits: 3
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
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
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
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
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
EDCI 714.

Hours of Lecture or Seminar per week
EDIT 717 - Teaching with Technology IV: Hypermedia and Emerging Technologies

Credits: 3
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
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
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.

Prerequisites
EDIT 717.

Corequisite
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
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
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

Credits: 3
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 - Analysis and Design of Multimedia/Hypermedia Environments

Credits: 3
Enables design, implementation, and evaluation of technology-based education and training materials using advanced computer-based authoring tools.

Prerequisites
EDIT 732, and knowledge of authoring tool.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

EDIT 732 - Advanced Instructional Design: Constructive Methods

Credits: 3
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.

Prerequisites
EDCI/EDIT 705.
EDIT 741 - TIP 1 Technology Innovations Project

Credits: 3
Students design and create technology-enriched learning module that can be used in specific educational setting or learning environment. Students paired with instructional designers, providing real world context for project development within cognitive apprenticeship model.

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
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 743 - Technology and Community Partnerships

Credits: 3
Explores nontraditional community partnerships in role in learning. Emphasizes partnerships between these non-traditional learning environments.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

EDIT 745 - Technology Leadership Issues

Credits: 3
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.

**EDIT 746 - Educational Technology and Assessment**

Credits: 3  
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.

**EDIT 747 - Technology and Teacher Development**

Credits: 3  
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.

**Prerequisites**  
EDIT 590 or equivalent.

**EDIT 748 - TIP 2 Technology Innovations Project**

Credits: 3  
Continuation of design and development of EDIT 741 technology-enriched learning module. Students conduct action research, and implement advanced action research project.

**Prerequisites**  
EDIT 741 and 590.
EDIT 750 - Emerging Educational Technologies

Credits: 3
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.

Notes
To be taken in final year of course work.

EDIT 752 - Design and Production of Multimedia and Hypermedia Learning Environments

Credits: 3
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.

Prerequisites
EDIT 730, or permission of instructor.

EDIT 771 - Introduction to Multimedia/Hypermedia

Credits: 1-3
Provides overview of tools used in instructional design. Focuses on developing skills necessary to implement hypermedia/multimedia ideas into production process.

EDIT 772 - Web-Based Instructional Tools
Credits: 1-3
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.

Hours of Lecture or Seminar per week
1-3

Hours of Lab or Studio per week
0

EDIT 773 - Human Computer Interface Design for Teaching and Learning

Credits: 3
Provides overview of human-computer interface issues related to instructional design of technology-centered learning environments. Examines continuum of human-computer feedback.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

EDIT 790 - Practicum in Instructional Technology

Credits: 1-6
Provides supervised practice in applying knowledge and skills of student's chosen track through placement in appropriate work setting.

Prerequisites
Completion of IT track requirements, except for practicum, and permission of advisor.

Hours of Lecture or Seminar per week
1-6

Hours of Lab or Studio per week
0

EDIT 791 - Project Development Practicum

Credits: 6
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
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
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

Credits: 3
Examines multi- and cross-disciplinary perspectives on the nature and process of designing and developing learning technologies.

Prerequisites
EDIT 705, EDRS 812

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
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
EDIT 895 - Emerging Issues in Instructional Technology

Credits: 3
Covers selected emerging issues. Examines ways instructional technology provides infrastructure for creating, managing, and evaluating innovative types of teaching-learning environments.

Prerequisites
Admission to PhD program, or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

EDLE 412 - Schools and the Law

Credits: 3
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.

Prerequisites
EDUC 300.

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
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.

Prerequisites
EDUC 300

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0
EDLE 500 - In-Service Educational Development

Credits: 1-6
Offered at request of school division or other educational agency.

Prerequisites
Employment in professional capacity by sponsoring division or 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

EDLE 597 - Special Topics in Education

Credits: 1-6
Provides advanced study on selected topic or emerging issue in American or international education.

Prerequisites
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

EDLE 598 - Directed Reading, Research, and Individual Projects

Credits: 1-6
Presents various subjects and projects, principally by directed study, discussion, research, and participation under supervision of graduate faculty member.

Prerequisites
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
EDLE 600 - Workshop in Education

Credits: 1-6
Offers full-time workshops and weekend seminars on selected topics in education and education tour seminars.

Notes
May be repeated for credit.

EDLE 610 - Leading Schools and Communities

Credits: 3
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.

Prerequisites
EDLE 620 or EDSE 743; EDLE 690; EDLE 791; EDLE 612; EDLE 614 or EDSE 702; EDLE 616 or EDSE 626, and EDLE 618.

EDLE 612 - Education Law

Credits: 3
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.

Prerequisites
EDLE 620 or EDSE 743; EDLE 690 and EDLE 791.
EDLE 614 - Managing Financial and Human Resources

Credits: 3
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.

Prerequisites
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
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.

Prerequisites
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
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.

Prerequisites
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
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
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
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.

Prerequisites
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
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.

Prerequisites
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
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.

Prerequisites
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 791 - Internship in Educational Leadership

Credits: 3
Offers wide range of practical experiences and professional challenges in authentic educational settings. Activities emphasize strategic, instructional, organizational, political, and community leadership.

Prerequisites
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

EDLE 797 - Advanced Topics in Education

Credits: 1-9
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
EDLE 801 - Foundations of Education Leadership History and Leadership

Credits: 3
Emphasizes historical foundations of U.S. education and evolution of school, district, and state leadership. Students begin work on analytical literature review.

Prerequisites
Admission to PhD in education program.

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

EDLE 802 - Foundations of Education Leadership: Ethics, Philosophy, and Law

Credits: 3
Emphasizes ethical, philosophical, and legal foundations of U.S. education; and the evolution of school, district, and state leadership. Students continue work on analytical literature review.

Prerequisites
EDLE 801

Notes
May be taken as corequisite with EDLE 801. Second in three course sequence.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

EDLE 803 - Foundations of Education Leadership: Economics and Leadership

Credits: 3
Emphasizes economic foundations of U.S. education, and evolution of school, district, and state leadership. Students complete work on analytical literature review.

Prerequisites
EDLE 801 and 802

Notes
Third in a three-course sequence.

Hours of Lecture or Seminar per week
3
EDLE 815 - Conceptual Frameworks in Education Leadership

Credits: 3
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.

Prerequisites/Corequisites
Prerequisite or corequisite: 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

EDLE 895 - Emerging Issues in Administration and Supervision

Credits: 3
Covers selected emerging issues in educational leadership. Students engage in research, study, discussion, and writing about various topics selected for study.

Prerequisites
Admission to PhD program, or permission of instructor

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

EDRD 300 - Literacy and Curriculum Integration

Credits: 3
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
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.

Corequisite
Requires 45 clock hours of school-based field experience during course

Notes
School-based field experience required.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

EDRD 419 - Literacy in the Content Areas

Credits: 3
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.

Prerequisites
EDCI 473 and EDCI 483.

Corequisite
EDCI 490.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

EDRD 500 - In-Service Educational Development

Credits: 1-6
Offered at request of school division or other educational agency.

Prerequisites
Employment in professional capacity by sponsoring division or agency.

Notes
Content varies; may be repeated for credit.

Hours of Lecture or Seminar per week
1-6
EDRD 501 - Literacy and Curriculum Integration, PK-12

Credits: 3
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
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.

Prerequisites
EDCI 510, EDCI 516, or Permission of Instructor

EDRD 558 - Literacy in the Content Areas, PK-12

Credits: 3
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
Provides advanced study on selected topic or emerging issue in American or international education.
**Prerequisites**
Admission to program in Graduate School of 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

**EDRD 610 - Content Literacy for English Language Learners, PK-12**

Credits: 3
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.

**Prerequisites**
EDRD 525 or Permission of Instructor

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**EDRD 614 - Teaching Reading in the Secondary School**

Credits: 3
Emphasizes reading and writing in content areas; reading and writing causes, classroom diagnosis, and remediation of reading problems; study skills; and rates of reading.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**EDRD 615 - Reading/Writing for Multilingual Students**

Credits: 3
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.

**Prerequisites**
EDCI 516 and 519, or permission of instructor or advisor.
EDRD 619 - Literacy in Content Areas

Credits: 3
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.

Prerequisites
Methods I (EDCI 567, 569, 572, or 573) and Methods II (EDCI 667, 669, 672, or 673).

Corequisite
EDCI 790 Internship.

EDRD 620 - Reading/Writing in Foreign/World Languages

Credits: 3
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.

Prerequisites
EDCI 516 and 519, or permission of instructor or advisor.

EDRD 630 - Advanced Literacy Foundations and Instruction, Birth to Middle Childhood

Credits: 3
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.
Prerequisites
Admission to the literacy emphasis, or permission of program coordinator.

Hours of Lecture or Seminar per week
3

EDRD 631 - Advanced Literacy Foundations and Instruction, Adolescence through Adulthood

Credits: 3
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.

Prerequisites
EDRD 630 and admission to the literacy emphasis, or permission of program coordinator.

Hours of Lecture or Seminar per week
3

EDRD 632 - Literacy Assessments and Interventions for Groups

Credits: 3
Provides literacy assessments and interventions for groups of learners. Includes exploration of assessment tools for classrooms and large populations. Class members conduct related practica in their own classrooms or specified field settings.

Prerequisites
EDRD 630 and 631; admission to literacy emphasis, or permission of the program coordinator.

Hours of Lecture or Seminar per week
3

EDRD 633 - Literacy Assessments and Interventions for Individuals

Credits: 3
Provides literacy assessments and interventions for individuals. Includes diagnosis and remediation for learners who find reading and writing difficult. Requires assigned practicum experience.

Prerequisites
EDRD 630, 631, and 632; admission to literacy emphasis; or permission of program coordinator.

Hours of Lecture or Seminar per week
EDRD 634 - School-Based Leadership in Literacy

Credits: 3
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.

Prerequisites
EDRD 630, 631, 632, and 633; admission to literacy emphasis or permission of program coordinator.

EDRD 635 - School-Based Inquiry in Literacy

Credits: 3
Capstone course in literacy emphasis focusing on research-based inquiry related to literacy in school settings. Includes review of literature and teacher inquiry project.

Prerequisites
EDRD 630, 631, 632, 633, and 634; admission to literacy emphasis; or permission of program coordinator.

EDRD 636 - Supervised Literacy Practicum II

Credits: 1
Supervised literacy practicum that requires students to engage in 30 practicum hours and five seminar hours.

Prerequisites
EDRD 630, 631

Corequisite
EDRD 632.
EDRD 637 - Supervised Literacy Practicum

Credits: 2-3
Supervised literacy practicum that requires students to conduct assessments of and provide instruction to struggling readers.

Prerequisites
EDRD 630, 631, 632

Corequisite
EDRD 633.

Hours of Lecture or Seminar per week
2-3
Hours of Lab or Studio per week
0

EDRD 658 - Advanced Reading Methods and Language Acquisition, Elementary

Credits: 3
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.

Prerequisites/Corequisites
Prerequisite or corequisite: 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
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
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.

Prerequisites
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
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.

Prerequisites
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
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.

Prerequisites
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
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.

Prerequisites/Corequisites
Prerequisites and/or corequisites: EDUC 800, EDRS 810, or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

EDRS 531 - Educational and Psychological Measurement

Credits: 3
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.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

EDRS 590 - Education Research

Credits: 3
Develops skills, insights, and understanding to perform research, with emphasis on interpreting and applying research results. Critiques research, and uses findings in educational settings.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

EDRS 597 - Special Topics in Education

Credits: 1-6
Provides advanced study on selected topic or emerging issue in American or international education.

Prerequisites
Admission to program in GSE.

Notes
May be repeated for credit with CEHD approval.
EDRS 620 - Quantitative Inquiry in Education

Credits: 3
Examines fundamental concepts and methods of statistics as applied to educational problems, including descriptive and inferential statistics.

Prerequisites
EDRS 590 or equivalent experience.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

EDRS 621 - Qualitative Inquiry in Education

Credits: 3
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.

Prerequisites
EDRS 590 or equivalent experience.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

EDRS 630 - Educational Assessment

Credits: 3
Examines research theory and practice relevant to assessments. Focuses on assessment strategies for students including developing skills to select, score, and interpret educational assessments.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0
EDRS 631 - Program Evaluation

Credits: 3
Introduces perspectives of existing and emerging issues, theories, and models of program evaluation.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

EDRS 797 - Advanced Topics in Education

Credits: 1-6
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

EDRS 810 - Problems and Methods in Education Research

Credits: 3
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.

Prerequisites
Admission to PhD program, or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

EDRS 811 - Quantitative Methods in Educational Research

Credits: 3
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.
Prerequisites
Satisfactory completion of EDUC 810 or equivalent, or permission of instructor.

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
Teaches how to apply qualitative data collection and analysis procedures in educational research, including ethnographic and other field-based methods, and unobtrusive measures.

Prerequisites
Satisfactory completion of EDUC 810 or equivalent, or permission of instructor.

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
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.

Prerequisites
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
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, critiques, and discussion of relevant journal articles; and application activities.

**Prerequisites**
EDRS 810 and 811.

**EDRS 822 - Advanced Applications of Qualitative Methods**

Credits: 3
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.

**Prerequisites**
EDRS 810 and 812.

**EDRS 823 - Advanced Research Methods in Single Subject/Case Design**

Credits: 3
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.

**Prerequisites**
EDRS 810, 811, and 812.

**EDRS 825 - Advanced Research Methods in Self-Study**

Credits: 3
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.

**Prerequisites**
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

**EDSE 401 - Introduction to Special Education**

Credits: 3
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
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
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.

**Prerequisites**
EDSE 401 and EDSE 440.
EDSE 405 - Introduction to Early Childhood Special Education

Credits: 3
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.

EDSE 411 - Characteristics of Students with Visual Impairments

Credits: 1
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.

EDSE 412 - Braille Code

Credits: 3
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.

Prerequisites
EDSE 411 (may be taken concurrently).

Notes
Delivered online.
EDSE 414 - Orientation and Mobility

Credits: 2
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.

Prerequisites
EDSE 511 (may be taken concurrently).

Notes
Delivered online.

EDSE 415 - Early Intervention for Infants and Toddlers with Disabilities: Collaborative and Consultative Approaches

Credits: 3
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
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.

Prerequisites
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 422 - Augmentative Communication

Credits: 2
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
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
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
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
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.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

EDSE 434 - Communication and Severe Disabilities

Credits: 3
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.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

EDSE 440 - Characteristics of Students with Disabilities Who Access the General Curriculum

Credits: 3
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.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

**EDSE 442 - Characteristics of Students with Mental Retardation**

Credits: 3
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.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

**EDSE 447 - Medical and Developmental Risk Factors for Children with Disabilities**

Credits: 3
Examines nature and causes of disabling or special health conditions. Examines screening and evaluation techniques, characteristics, and educational implications.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

**EDSE 456 - Language Development and Communication for Diverse Infants and Toddlers**

Credits: 3
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.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0
EDSE 457 - Foundations of Language and Literacy for Diverse Learners

Credits: 3
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.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

EDSE 458 - Medical Aspects of Physical and Sensory Disabilities in Young Children

Credits: 3
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.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

EDSE 459 - Curriculum and Methods: Early Childhood Special Education

Credits: 3
Emphasizes planning, organizing, implementing, and evaluating programs for young children with special needs.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

EDSE 500 - In-Service Educational Development

Credits: 1-6
Offered at request of school division or other educational agency.

Prerequisites
Employment in professional capacity by sponsoring division or agency.

Notes
Content varies; may be repeated for credit.
EDSE 501 - Introduction to Special Education

Credits: 3
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.

EDSE 502 - Classroom Management and Applied Behavior Analysis

Credits: 3
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.

EDSE 503 - Language Development and Reading

Credits: 3
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.

EDSE 504 - Elementary Curriculum and Content for Special Educators
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.

**EDSE 505 - Introduction to Early Childhood Special Education**

Credits: 3
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

**EDSE 510 - Introduction to Assistive Technology**

Credits: 3
Cross-Listed with EDIT 510
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.

**EDSE 511 - Characteristics of Students with Visual Impairments**

Credits: 1
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**
EDSE 512 - Braille Code

Credits: 3
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.

Prerequisites
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
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.

Prerequisites
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
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.

**Prerequisites**
EDSE 511 (may be taken concurrently).

**Notes**
Delivered online.

**EDSE 517 - Computer Applications for Special Populations**

Credits: 3
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.

**Prerequisites**
Graduate standing, or permission of instructor.

**Hours of Lecture or Seminar per week**
2

**Hours of Lab or Studio per week**
0

**EDSE 518 - Curriculum and Assessment of Students with Visual Impairments**

Credits: 3
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.

**Prerequisites**
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 522 - Assistive Technology for Individuals with Sensory Impairments

Credits: 2-3
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.

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
Provides overview of accessibility/input modifications and strategies. Students explore various input devices and their application and use by individuals with disabilities.

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
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.

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
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.

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
Develops understanding of principles of universal web design. Students apply understanding by designing and developing accessible web site using web-authoring tools.

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
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
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
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.

Prerequisites
HTML experience.
EDSE 530 - Policy Perspectives Affecting Diverse Young Learners and Their Families

Credits: 3
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.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

EDSE 531 - Transition and Community-Based Instruction

Credits: 3
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.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

EDSE 532 - Positive Behavior Supports

Credits: 3
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.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0
**EDSE 533 - Curriculum and Assessment in Severe Disabilities**

Credits: 3
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.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

**EDSE 534 - Communication and Severe Disabilities**

Credits: 3
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.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

**EDSE 540 - Characteristics of Students with Disabilities who Access the General Curriculum**

Credits: 3
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.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

**EDSE 542 - Characteristics of Students with Mental Retardation**

Credits: 3
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.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**EDSE 544 - Adapted Instructional Methods and Transition for Secondary Learners**

Credits: 3
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.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**EDSE 547 - Medical and Developmental Risk Factors for Children with Disabilities**

Credits: 3
Examines nature and causes of disabling or special health conditions. Covers screening and evaluation techniques, characteristics, and educational implications.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**EDSE 551 - Classroom Management: Theory and Practice**

Credits: 3
Focuses on identifying, recording, evaluating, and changing social and academic behaviors of diverse student populations. Explores theories of classroom management, and presents various approaches to instructional, behavioral, and environmental management. Addresses the development of Individualized Education Programs and their impact on management issues. May require field experience in public schools.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**EDSE 553 - Teaching Mathematics to Students with Special Needs**
Credits: 3
Covers techniques for assessing and remediating difficulties in mathematics.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**EDSE 555 - Language Development and Emerging Literacy**

Credits: 3

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**EDSE 556 - Developing Language, Literacy, and Communication in Young Children**

Credits: 3

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.

**Notes**
Field Experience required

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**EDSE 557 - Foundations of Language and Literacy for Diverse Learners**

Credits: 3

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.
Prerequisites
Admission to a Mason graduate program

Notes
Field Experience required

EDSE 558 - Medical Aspects of Physical and Sensory Disabilities in Young Children

Credits: 3

Prerequisites
Admission to a Mason graduate program.

Notes
Field Experience required

EDSE 590 - Special Education Research

Credits: 3
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.

EDSE 597 - Special Topics in Education

Credits: 1-6
Provides advanced study on selected topic or emerging issue in American or international education.
**EDSE 600 - Workshop in Education**

Credits: 1-6
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
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.

**Prerequisites**
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
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.
**Prerequisites/Corequisites**
Prerequisite or corequisite: admission to FAST TRAIN program for graduate course work, 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
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.

**Prerequisites**
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
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.

**Prerequisites**
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
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.

**Prerequisites**
EDSE 512; 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 619 - Applied Behavior Analysis: Principles, Procedures, and Philosophy**

Credits: 3
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.

**Prerequisites**
Admission to applied behavior analysis graduate certificate program.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**EDSE 620 - Managing Severely Challenging Behaviors and Applied Behavior Analysis**

Credits: 3
Focuses on applying behavior analysis principles and social learning theory to increase learning by students with special needs. Emphasizes single subject research designs.

**Prerequisites**
Graduate standing and permission of advisor.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**EDSE 621 - Applied Behavior Analysis: Empirical Bases**

Credits: 3
Focuses on basic content of applied behavior analysis. Teaches how to implement behavioral procedures and develop behavioral
programs for clients with fundamental behavioral needs.

**Prerequisites/Corequisites**
Prerequisite or corequisite: EDSE 619.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**EDSE 622 - Augmentative Communication**

Credits: 2
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
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.

**Prerequisites**
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
Expands capability to deal with more complex behavioral situations, enabling ability to relate to more sophisticated professional issues and environments.

**Prerequisites/Corequisites**
Prerequisite or corequisite: EDSE 623.

**Hours of Lecture or Seminar per week**
3
EDSE 625 - Applied Behavior Analysis: Verbal Behavior

Credits: 3
Further expands capability to deal with more complex behavioral situations, and enables students to relate to more sophisticated professional issues and environments.

Prerequisites
EDSE 623.

EDSE 626 - The Inclusive Classroom

Credits: 3
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.

Prerequisites
None

EDSE 627 - Assessment

Credits: 3

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.
EDSE 628 - Elementary Reading, Curriculum, and Strategies for Students who Access the General Education Curriculum

Credits: 3
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
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

Credits: 3
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.

Prerequisites
Admission to a Mason graduate program.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

EDSE 634 - Characteristics of Students with Autism
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
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
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.

Prerequisites
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
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.

Prerequisites
EDSE 648 is required for ED/LD students.
EDSE 655 - Curriculum Methods: Elementary ED/LD

Credits: 3
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.

EDSE 656 - Assessment of Diverse Young Learners

Credits: 3
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.

Prerequisites
Admission to the Early Childhood Special Education program or permission of the instructor

Notes
Field Experience required

EDSE 659 - Curriculum and Methods: Early Childhood Special Education

Credits: 3

Prerequisites
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
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
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.

Prerequisites
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
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.

Prerequisites
Admission to the Early Childhood Special Education program or permission of the instructor

Hours of Lecture or Seminar per week
3
EDSE 667 - Cognitive Development of Diverse Young Children

Credits: 3
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.

Prerequisites
Admission to Mason graduate program.

EDSE 669 - Interdisciplinary Approach for Children with Sensory and Motor Disabilities

Credits: 3
Emphasizes positioning, handling, and adaptive strategies. Focuses on understanding the roles of related disciplines in collaborative planning and service delivery.

EDSE 701 - Legal Issues and Special Populations

Credits: 3
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.
Credits: 3
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.

Prerequisites
None

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

EDSE 703 - Creating a Collaborative Culture

Credits: 3
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.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

EDSE 743 - Leadership in Special Education Administration

Credits: 3
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.

Prerequisites
None

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

EDSE 744 - Current Issues in Special Education

Credits: 3
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.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

### EDSE 782 - Comprehensive Topics in Special Education: Trends and Issues

Credits: 3
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.

**Prerequisites**
Majority of course work.

### EDSE 790 - Internship in Special Education

Credits: 1-6
Supervised internships that apply university course work to instruction of children and their families in school and community settings.

**Prerequisites**
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
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.

**Prerequisites/Corequisites**
Prerequisite and corequisite: 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
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**
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 794 - Special Topics**

Credits: 1-6
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
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
EDSE 841 - Intervention Research in Special Education

Credits: 3
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.

Prerequisites
Admission to PhD in education program, or permission of instructor.

EDSE 842 - Application of Research Methodology in Special Education

Credits: 3
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.

Prerequisites
Admission to PhD in education program, or permission of instructor.

EDSE 843 - Leadership in Special Education Administration

Credits: 3
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.

Prerequisites
Admission to PhD in education program, or permission of instructor.
EDSE 844 - Current Issues in Special Education

Credits: 3
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.

Prerequisites
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 203 - Human Disabilities in American Culture

Credits: 3
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
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
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
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
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
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.

Notes
School-based field experience required.
EDUC 400 - In-Service Educational Development

Credits: 1-6
Offered at request of school division or other educational agency.

Prerequisites
Employment in professional capacity by sponsoring division or agency.

Notes
Content varies; may be repeated for credit.

EDUC 415 - Student Teaching in Physical Education

Credits: 12
See PHED 415.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
12

EDUC 418 - Student Teaching in Music Education

Credits: 6
Provides intensive, supervised clinical experience in approved Virginia schools, and supplemental course work appropriate to student's area of concentration (vocal and choral or instrumental). Experiences are in elementary or secondary school settings.

Prerequisites
Completion of requirements for admission to music education concentration.
EDUC 422 - Foundations of Secondary Education

Credits: 3
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.

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
Offered at request of school division or other educational agency.

Prerequisites
Employment in professional capacity by sponsoring division or 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 511 - Introduction to Education in International Schools

Credits: 3
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.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

EDUC 512 - Teaching Elementary Social Studies in International Schools

Credits: 3
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.

Hours of Lecture or Seminar per week

EDUC 513 - Teaching Elementary Math in International Schools

Credits: 3
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.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

EDUC 514 - Teaching Elementary Science in International Schools

Credits: 3
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.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

EDUC 516 - Language Across the Elementary International School Curriculum

Credits: 3
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.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

EDUC 520 - Elementary Curriculum, Instruction, and Assessment in International Schools

Credits: 3
Addresses interrelationship of instruction, curriculum, and assessment in international schools. Includes review of research and effective practice.
EDUC 521 - Foundations of Education, PK-12

Credits: 3
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.

EDUC 522 - Foundations of Secondary Education

Credits: 3
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
Requires field experiences.

EDUC 537 - Foundations of Multicultural Education

Credits: 3
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
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.

EDUC 542 - Foundations of Education

Credits: 3
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.

Prerequisites
Admission into elementary education graduate program; must be taken in programmatic sequence.

EDUC 543 - Children, Family, Culture, and Schools, 4-12 Year Olds

Credits: 3
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.

Prerequisites
Admission to elementary education licensure program.

Notes
Requires school-based field experience.
EDUC 546 - Integrating Technology in Elementary Classrooms: Literacy

Credits: 1
Studies the development and integration of technology in the elementary education literacy curriculum.

Prerequisites
Admission into elementary education graduate program

Corequisite
EDCI 556

EDUC 547 - Integrating Technology in Elementary Classrooms: Mathematics

Credits: 1
Studies the development and integration of technology in the elementary education mathematics curriculum.

Prerequisites
Admission into elementary education graduate program

Corequisite
EDCI 552

EDUC 548 - Integrating Technology in Elementary Classrooms: Social Studies and Fine Arts

Credits: 1
Studies the development and integration of technology in the elementary education social studies and fine arts curriculum.

Prerequisites
Admission into elementary education graduate program

Corequisite
EDCI 554
**EDUC 559 - Research and Assessment in Elementary Education**

Credits: 3
Provides teacher candidates understanding of research paradigms using systematic evidence to improve practice and further skills at assessment of learning outcomes. Emphasizes linking research and practice, making instructional decisions based on systematically collected data.

**Prerequisites**
Admission into elementary education graduate program; capstone course for degree must be taken last in programmatic sequence.

**EDUC 597 - Special Topics in Education**

Credits: 1-6
Provides advanced study on selected topic or emerging issue in American or international education.

**Prerequisites**
Admission to program in Graduate School of Education.

**Notes**
May be repeated for credit with GSED permission.

**EDUC 598 - Directed Reading, Research, and Individual Projects**

Credits: 1-6
Presents various subjects and projects, principally by directed study, discussion, research, and participation under supervision of graduate faculty member.

**Prerequisites**
Admission to degree program, and permission of dean.

**Notes**
EDUC 599 - Thesis

Credits: 1-6
Study of problem of significant interest to student using accepted research methods and under supervision of graduate faculty member.

Prerequisites
EDRS 590.

EDUC 600 - Workshop in Education

Credits: 1-6
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
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
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.

Prerequisites
Admission to TESL or bilingual or multicultural education program, doctoral status, or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

EDUC 612 - Inquiry into Practice

Credits: 2
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

EDUC 613 - How Students Learn

Credits: 3
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

EDUC 614 - Designing and Assessing Teaching and Learning

Credits: 2
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.

Hours of Lecture or Seminar per week
EDUC 615 - Educational Change

Credits: 2
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.

Hours of Lecture or Seminar per week
2

Hours of Lab or Studio per week
0

EDUC 621 - Teaching and Learning in the International Baccalaureate Primary Years Program

Credits: 3
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.

Prerequisites
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

EDUC 622 - Curriculum Development across IB Programs

Credits: 3
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.

Prerequisites
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
EDUC 623 - Models and Strategies for Teaching and Learning in IB Schools

Credits: 3
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.

Prerequisites
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

EDUC 624 - Assessment and Learning in IB Schools

Credits: 3
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.

Prerequisites
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

EDUC 626 - Inquiry into Action: IB Teachers, Learners, and Schools

Credits: 3
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.

Prerequisites
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
EDUC 627 - Contemporary Issues and Trends in IB

Credits: 3
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.

Prerequisites
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

EDUC 634 - The Role of the School Library Media Specialist

Credits: 3
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.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

EDUC 640 - Selection and Utilization of Library Media Materials and Equipment, Including Technology

Credits: 3
Introduces prospective library media specialists to various uses of technology in library setting, and elements involved in media collection development.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

EDUC 641 - Reference and Bibliography

Credits: 3
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
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
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
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
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.

**EDUC 646 - Literature for Children**

Credits: 3
Develop critical abilities to select and use literature for children. Focuses on selecting materials to support curriculum and promote reading.

**EDUC 670 - The Culture of Teaching**

Credits: 3
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.

Prerequisites
Admission to secondary education program

Corequisite
Initial methods course.

**EDUC 671 - Schools and Culture**

Credits: 3
Focuses on relationship between schools and communities they serve. Explores historical roots of contemporary educational practice, and examines important directions defined by contemporary school-reform efforts.

Prerequisites
Initial methods course and EDUC 670.
**EDUC 672 - Human Development and Learning: Secondary Education**

Credits: 3
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.

**EDUC 674 - Assessing Learning and Teaching in the Secondary School Classroom**

Credits: 3
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.

**EDUC 675 - Research in Secondary Education**

Credits: 3
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.

**EDUC 695 - Northern Virginia Writing Project-Service Program**
Credits: 1-3  
**Cross-Listed with** ENGL 695

Offered at request of school division or other educational agency.

**Prerequisites**
Admission to graduate program, or permission of dean.

**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

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**EDUC 697 - Theory of Composition**

Credits: 3  
**Cross-Listed with** ENGL 697

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.

**Prerequisites**
ENGL 615 and 695, or equivalent.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

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**EDUC 751 - Mentoring/Supervising Intern Teachers and Mentor Teacher Career Development**

Credits: 3

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 797 - Advanced Topics in Education

Credits: 1-6
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
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.

Prerequisites
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

EDUC 802 - Leadership Seminar

Credits: 3
Intensive study of leadership, emphasizing decision and change processes, and assessment and development of leadership skills.

Prerequisites
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
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.

Prerequisites
Admission to PhD in Education Program

Hours of Lecture or Seminar per week
2
Hours of Lab or Studio per week
0

EDUC 850 - The Study of Teaching

Credits: 3
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.

Prerequisites
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
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.

Prerequisites
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
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.

Prerequisites
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
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.

Prerequisites
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
In-depth analysis of selected education policy issues. Focuses on issue interactions and education-related policy actions by different levels of government.

Prerequisites
EDUC 870 or equivalent.

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
Focuses on research base used to support education policy actions. Focuses on analyzing strength of this research.

Prerequisites
Admission to PhD program, and EDUC 870 and 871; or equivalent doctoral-level policy course work.

** 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  
Using interdisciplinary approach, addresses education policy issues that transcend national boundaries and have implications for educators in fostering social justice and global awareness.

**Prerequisites/Corequisites**  
Prerequisites or corequisites: EDUC 870 and admission to PhD program.

** Hours of Lecture or Seminar per week  
3

** Hours of Lab or Studio per week  
0

### EDUC 874 - The Achievement Gap

Credits: 3  
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.

**Prerequisites/Corequisites**  
Prerequisite or corequisite: 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  
Focuses on identifying and analyzing factors that promote new initiatives in education policy agenda. Attention given to nontraditional sources of education policy initiatives.

**Prerequisites/Corequisites**  
Prerequisites or corequisites: EDUC 870 and admission to PhD program.

** Hours of Lecture or Seminar per week  
3
EDUC 876 - Teacher Development and Education Policy

Credits: 3
Focuses on the impact of policy actions at the local, state, and national levels on teacher preparation and continuing professional development.

Prerequisites
EDUC 870 or permission of instructor.

EDUC 880 - Introduction to International Education

Credits: 3
Using interdisciplinary approach, addresses education policy issues that transcend national boundaries and have implications for educators in fostering social justice and global awareness.

Prerequisites/Corequisites
Prerequisite or corequisite: admission to PhD in education program or permission of instructor.

EDUC 881 - Seminar in Bilingual Education: Policy

Credits: 3
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.

Prerequisites
Admission to PhD program.
EDUC 882 - Seminar in Bilingualism and Second Language Acquisition: Theory and Research

Credits: 3
Examines theoretical foundations of bilingual and ESL education through focus on linguistics, anthropology, sociology, psychology, and education research addressing language minority students.

Prerequisites
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
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.

Prerequisites
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
Interns work with appropriate staff member in cooperating school, school system, or other educational institution, agency, or setting.

Prerequisites
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.

Hours of Lecture or Seminar per week
1-6
Hours of Lab or Studio per week
0
EDUC 892 - Social Justice and Equity in International Education

Credits: 3
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.

Prerequisites/Corequisites
Prerequisite or corequisite: EDUC 895.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

EDUC 893 - Seminar in Educational Anthropology

Credits: 3
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.

Prerequisites
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 894 - Seminar in Multicultural Education

Credits: 3
Examines knowledge base, policy issues, and curricular and instructional features of multicultural education in United States and other countries.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

EDUC 895 - Seminar in Emerging Issues of Education

Credits: 3
Study of selected emerging issues or problems in education. Students engage in research, study, discussion, and writing.
Prerequisites
Successful completion of EDUC 800.

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
Structured learning experience to extend and develop skills and knowledge relative to field of professional expertise.

Prerequisites
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

EDUC 994 - Advanced Internship in Education

Credits: 3
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.

Prerequisites
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

EDUC 998 - Doctoral Dissertation Proposal

Credits: 1-3
Prerequisites
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**
1-3

**Hours of Lab or Studio per week**
0

**EDUC 999 - Doctoral Dissertation Research**

Credits: 1-9
Provides continued faculty assistance on individual basis to complete dissertation planned in EDUC 998 and initiate new projects.

**Prerequisites**
Admission to candidacy in PhD program and faculty approval of dissertation proposal.

**Notes**
May be repeated for credit. No more than 11 credits of EDUC 998 and 999 may be applied toward minimum PhD degree requirements.

**Hours of Lecture or Seminar per week**
1-9

**Hours of Lab or Studio per week**
0

**EDUT 411 - Developmental Pathways of Diverse Learners, Birth-Adolescence**

Credits: 3
Provides knowledge of child and family development from diverse and cultural perspectives, offering appreciation for critical role of families. Explores role of culture, various disabilities, and theories for understanding and interpreting child and family growth and development.

**Notes**
Field experience required

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**EDUT 413 - Foundations of Language and Literacy for Diverse Learners**

Credits: 3
**Cross-Listed with** EDUT 513

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

**EDUT 414 - Curriculum and Instruction for Diverse Learners, Ages 3-5**

Credits: 3
Cross-Listed with EDUT 514


**Notes**
Field experience required

**EDUT 423 - Language Acquisition and Communication for Diverse Infants and Toddlers**

Credits: 3
Provides understanding of early language development in terms of the five major components of language. Speech, language, and communication are discussed, particularly in terms of interrelatedness with cognitive and sociocultural development. Explores importance of adult-child interaction; and impact of bilingualism, cultural diversity, cognitive ability, and language disorder.

**EDUT 424 - Culturally, Linguistically, and Developmentally Appropriate Practices with Infants, Toddlers, and their Families**

Credits: 3
Provides understanding of culturally, linguistically, and developmentally appropriate programs and practices in community settings that provide services to infants and toddlers with varied abilities and their families. Students explore, plan, and implement developmentally supportive activities, and are expected to become familiar with cultural context of infants and
toddlers with whom they are working. Special emphasis on providing home-based services.

**Hours of Lecture or Seminar per week**
- 3

**EDUT 511 - Developmental Pathways of Diverse Learners, Birth-Adolescence**

Credits: 3
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.

**Notes**
Field experience required

**Hours of Lecture or Seminar per week**
- 3

**EDUT 512 - Assessment of Diverse Young Learners, Ages 3-5**

Credits: 3
Provides understanding of forms, functions, methods, and roles of assessment for planning and implementing effective early childhood programs for children ages 3-5 from diverse cultures and with varied learning needs. Teaches quantitative and qualitative approaches to evaluation and assessment. Students learn about technological adaptations, and gain understanding of appropriate strategies for conducting, reporting, and decision-making related to specific functions of assessment. They also learn about assessment strategies for second language learners, and adaptations for children with disabilities.

**Prerequisites**
Admission to UTEEM program, or permission of instructor.

**Hours of Lecture or Seminar per week**
- 3

**EDUT 513 - Foundations of Language and Literacy for Diverse Learners**

Credits: 3
Cross-Listed with EDUT 413
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

EDUT 514 - Curriculum and Instruction for Diverse Learners, Ages 3-5

Credits: 3

Cross-Listed with EDUT 414


Notes
Field experience required

EDUT 521 - Infant/Toddler Development in Family and Cultural Contexts

Credits: 3

Teaches about development of infants and toddlers in family and cultural contexts. Students explore role of family, culture, and developmental theories in providing frameworks for understanding and interpreting behavior of children from birth to age 3. Students learn about factors that place infants and toddlers at developmental risk, and other disabilities.

Prerequisites
Admission to UTEEM program, or permission of instructor.

EDUT 522 - Family-Centered Assessment of Diverse Infants and Toddlers
Credits: 3
Focuses on family-centered practice in assessing infants and toddlers with diverse cultures and abilities. Teaches assessment practices that lead to plans for supporting infant development in individually and culturally relevant ways. Offers understanding of appropriate strategies for conducting, reporting, and decision making related to specific functions of assessment, and adapting assessment practices for culturally, linguistically, and ability diverse infants and toddlers and their families.

Prerequisites
Admission to UTEEM program, or permission of instructor.

Hours of Lecture or Seminar per week
3

EDUT 523 - Developing Language, Literacy, and Communication in Diverse Young Children

Credits: 3
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.

Notes
Field Experience required

Hours of Lecture or Seminar per week
3

EDUT 524 - Culturally, Linguistically, and Developmentally Appropriate Practices with Infants, Toddlers, and Their Families

Credits: 3
Explores culturally, linguistically, and developmentally appropriate programs and practices in community settings that provide services to infants and toddlers with varied abilities and their families. Students explore, plan, and implement developmentally supportive activities with infants and toddlers and their families, and are expected to become familiar with cultural context of infants and toddlers with whom they are working. Special emphasis on providing home-based services.

Prerequisites
Admission to UTEEM program, or permission of instructor.

Hours of Lecture or Seminar per week
3

EDUT 612 - Assessment of Diverse Young Learners
Credits: 3
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.

Prerequisites
Admission to the Early Childhood Education program or permission of the instructor

Notes
Field Experience required

EDUT 613 - Language and Literacy Assessment and Instruction for Diverse Young Learners

Credits: 3

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.

Prerequisites
Admission to Early Childhood 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

EDUT 614 - Curriculum Across the Content Areas for Diverse Learners, K-3

Credits: 3
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.

Prerequisites
Admission to the Early Childhood program or permission of the instructor.

Corequisite
Must be taken concurrently with EDUT 790

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

EDUT 615 - Mathematics and Science for Diverse Young Learners

Credits: 3  
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.

Prerequisites  
Admission to the Early Childhood 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

EDUT 781 - Frameworks for Unified, Transformative Early Care and Education

Credits: 3  
Provides opportunity to analyze foundational frameworks for developing unified perspective for working with culturally, linguistically, and ability diverse young learners, birth to age 8, and their families. Students examine foundational work from separate fields of early childhood education, early childhood special education, multicultural education, and second language acquisition and bilingual education.

Prerequisites  
Admission to UTEEM program, or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

EDUT 782 - Policy Perspectives Affecting Diverse Young Learners and Their Families

Credits: 3  
Advanced seminar explores 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 early childhood
education. Provides understanding of continuum of services and context of service delivery.

**Prerequisites**
Admission to UTEEM program, or permission of instructor.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**EDUT 790 - Internship with Diverse Learners**

Credits: 3
Enables students to participate full time in inclusive early childhood setting serving families of infants and toddlers with diverse learning needs. Links university course work to real world of working with diverse families and their infants and toddlers. Students engage in carefully planned learning sequence, including observing infants and toddlers, environments, and intervention strategies that identify family concerns, priorities, and resources.

**Prerequisites**
Admission to Early Childhood Education program or permission of the instructor

**Corequisite**
Must be taken concurrently with EDUT 614

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**EDUT 791 - Internship with Diverse Infants and Toddlers and Their Families**

Credits: 3
Enables students to participate full time in inclusive early childhood setting serving families of infants and toddlers with diverse learning needs. Links university course work to real world of working with diverse families and their infants and toddlers. Students engage in carefully planned learning sequence, including observing infants and toddlers, environments, and intervention strategies that identify family concerns, priorities, and resources.

**Prerequisites**
Admission to UTEEM program, or permission of instructor.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**EDUT 792 - Internship with Diverse Learners, K-3**
EDUT 793 - Specialization Internship with Diverse Learners and Their Families

Credits: 6
Enables students to participate full time in education setting serving diverse children and their families, becoming involved in range of activities to ensure experience and understanding of the complexity, uniqueness, and significance of the work done.

Prerequisites
Passing scores on Praxis I and II, and admission to UTEEM program; or permission of instructor.

Hours of Lecture or Seminar per week
6

Hours of Lab or Studio per week
0

EDUT 801 - Current Research and Trends in Early Education of Diverse Learners

Credits: 3
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.

Prerequisites
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

EDUT 804 - Families of Diverse Young Learners - Interdisciplinary and Cross-cultural Research, Policy, and Practice

Credits: 3
Explores the relationship between families and professionals in providing appropriate early care and education for diverse young learners.
children. Course includes in-depth study, analysis, and discussion of original research as well as syntheses of findings.

**Prerequisites**
Admission to doctoral program or post-master's status and permission of instructor.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**EDUT 805 - Personnel Preparation and Professional Development in Early Education of Diverse Learners**

Credits: 3
Explores research and current recommended practices related to professional development and teacher education in early care and education of diverse learners. Provides opportunity for practical application with pre-service or in-service early educators.

**Prerequisites**
Admission to doctoral program or post-master's status and permission of instructor.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**EDUT 806 - Early Childhood Cognition, Language, and Literacy for Diverse Young Learners**

Credits: 3
Develops an understanding of research and practice related to cognition, language, and literacy in a sociocultural context in the early childhood education of diverse learners, including special education and multicultural/multilingual education.

**Prerequisites**
Admission to doctoral program or post-master's status and permission of instructor.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**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.
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.

Prerequisites
EEP 601.

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.

Prerequisites
EEP 601.

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.

Prerequisites
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.

**Prerequisites**
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.

**Prerequisites**
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.

**Prerequisites**
EEP 604.

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.

Prerequisites
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
Focuses on completing capstone project in enterprise engineering and policy. Designed as two-semester project, with student closely guided by faculty advisor.

Notes
Topic selected by mutual agreement with faculty advisor.

Hours of Lecture or Seminar per week
3
EFHP 500 - Workshop in Exercise, Fitness, and Health Promotion

Credits: 1-3
Provides concentrated full-time workshops, weekend seminars, and workshops on selected topics in exercise, fitness, and health promotion.

Prerequisites
Graduate standing or permission of instructor

Notes
May be repeated. No more than 6 credits may be applied for degree credit.

EFHP 522 - Anatomy for the Athletic Trainer: Structure and Function of the Neuromuscular and Musculoskeletal Systems

Credits: 3
Promotes familiarity and proficiency with anatomy of neuromuscular and musculoskeletal systems, which relate directly to sports related injuries.

Prerequisites
BIOL 124 and 125 or equivalent, and permission of instructor

EFHP 524 - Physiology for the Athletic Trainer Including the Pharmacology of Sports Injuries

Credits: 3
Promotes familiarity and proficiency in physiology, pharmacology, and rehabilitation of sports injuries.

Prerequisites
BIOL 124 and 125 or equivalent, and permission of instructor
EFHP 526 - Athletic Training Perspectives: Evaluation and Prevention of Sports Injuries

Credits: 3
Promotes familiarity and proficiency with assessment and physical examination of sports-related injuries.

Prerequisites
BIOL 124 and 125 or equivalent, and permission of instructor

Notes
Recommended that this course be taken concurrently with EFHP 522.

EFHP 528 - Advanced Athletic Training

Credits: 3
Promotes familiarity and proficiency with assessment and intervention of neuromusculoskeletal system and other systems of body that relate directly to sports-related injuries.

Prerequisites
BIOL 124 and 125 or equivalent, EFHP 526, and permission of instructor

EFHP 598 - Special Topics

Credits: 1-6
Focuses on projects related to exercise, fitness, or health promotion.

Prerequisites
Graduate standing or permission of instructor

Notes
May be repeated with no more than 6 credits earned. 599 Independent Study in Exercise, Fitness, and Health Promotion (1-3:1-3:0) Study of problem area 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
2
Hours of Lab or Studio per week
1
EFHP 606 - Foundations of Exercise, Fitness, and Health Promotion

Credits: 3
Insights into historical and philosophical foundations that guide exercise, fitness, and health promotion professions. Through assigned readings, group exercises, individual research, and class discussion, students explore disciplines, professions, and associated philosophical trends and issues.

Prerequisites
Graduate standing or permission of instructor

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

EFHP 610 - Advanced Exercise Physiology

Credits: 3
Lecture, demonstration, and seminar experiences in applying research findings to understanding physiological function and effects of exercise on people.

Prerequisites
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
Promotes familiarity and proficiency with methods and instrumentation in assessing individual fitness and establishing base for exercise and other lifestyle alternatives to improve fitness.

Prerequisites
Graduate standing or permission of instructor

Hours of Lecture or Seminar per week
2

Hours of Lab or Studio per week
2
EFHP 614 - Advanced Exercise Nutrition

Credits: 3
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.

Prerequisites
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
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.

Prerequisites
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
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.

Prerequisites
Graduate standing or permission of 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
Introduces techniques of research and methods of data analysis.

Prerequisites
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
Covers exercise and health program development related to fitness and health of adult populations.

Prerequisites
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

EFHP 660 - Management of Exercise, Fitness, and Health Promotion Organizations

Credits: 3
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.

Prerequisites
Graduate standing or permission of instructor

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

EFHP 670 - Analysis of Teaching in Physical Education
Credits: 3
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.

**Prerequisites**
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
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.

**Prerequisites**
Graduate standing or permission of instructor

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**EFHP 798 - Project**

Credits: 1-3
Addresses an applied exercise, fitness, and health promotion issue under supervision of graduate faculty member.

**Prerequisites**
Graduate standing or permission of instructor

**Hours of Lecture or Seminar per week**
1-3

**Hours of Lab or Studio per week**
0

**EFHP 799 - Thesis**

Credits: 1-6
Explores exercise, fitness, and health promotion problem using appropriate research methodology and under supervision of graduate faculty member.

**Prerequisites**
EFHP 802 - Readings for the Doctor of Arts in Community College Education

Credits: 3-9
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.

Prerequisites
Graduate standing or permission of instructor

Hours of Lecture or Seminar per week
1-6

Hours of Lab or Studio per week
0

EMBA 603 - Managerial Economics and the Decisions of the Firm

Credits: 3
Develops and applies economic analysis tools in managerial decision situations. Focuses on economic analysis to understand firm's competitive environment.

Prerequisites
Admission to EMBA program.

Hours of Lecture or Seminar per week
3-9

Hours of Lab or Studio per week
0

When Offered
Fall

EMBA 612 - Managing Costs and Evaluating Performance

Credits: 1-3
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.

Prerequisites
Admission to EMBA program.
EMBA 613 - Financial Reporting and Decision Making

Credits: 3
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.

Prerequisites
Admission to EMBA program.

EMBA 623 - Marketing Management

Credits: 3
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.

Prerequisites
Admission to EMBA program.

Prerequisites/Corequisites
Admission to EMBA program.

EMBA 633 - Statistics for Managers
Credits: 3
Applies statistical methods in analyzing problems in business decision-making. Topics include descriptive statistics, probability distributions, estimation and hypothesis testing, and linear regression.

Prerequisites
Admission to EMBA program.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

When Offered
Fall

EMBA 638 - Strategies for Operations Management: Process and Supply Chain Leadership

Credits: 3
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.

Prerequisites
Admission to EMBA program.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

When Offered
Spring

EMBA 641 - Building the High-Performing Team

Credits: 1-3
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.

Prerequisites
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 643 - Managerial Finance

Credits: 3
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.

Prerequisites
Admission to EMBA program.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0
When Offered
Spring

EMBA 653 - Organizational Behavior

Credits: 3
Examines development, theories, and practice of management within organizations. Emphasizes human behavior and how it influences organizational effectiveness.

Prerequisites
Admission to EMBA program.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0
When Offered
Fall

EMBA 660 - Management of Information Technology

Credits: 3
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.

Prerequisites
Admission to EMBA program.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0
EMBA 673 - Legal Environment for Management

Credits: 1.5
Examines the managerial impact of the law upon decision-making processes in business organizations. Lectures as well as discussions of judicial opinions and readings.

Prerequisites
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 678 - Strategic Management

Credits: 3
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.

Prerequisites
Admission to EMBA program.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0
When Offered
Spring

EMBA 703 - Financial Markets

Credits: 3
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.

Prerequisites
Admission to EMBA program.

Hours of Lecture or Seminar per week
EMBA 708 - Taxation and Business Strategy

Credits: 1-3
Examines influences of taxation on decisions of firms, and effects of taxes on performance in competitive setting. Emphasizes specific coverage of international issues, and role of non-tax costs in tax planning.

Prerequisites
Admission to EMBA program.

EMBA 709 - Global Capital Markets

Credits: 1-3
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.

Prerequisites
Admission to EMBA program.

EMBA 710 - Business, Government, and the Global Economy

Credits: 1.5
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.

Prerequisites
Admission to EMBA program.
EMBA 712 - International Macroeconomics: Concepts and Country Strategy

Credits: 1.5
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.

Prerequisites
Admission to EMBA program.

EMBA 715 - Special Topics in Accounting

Credits: 1-3
In-depth examination of advanced topics in accounting.

Prerequisites
Admission to EMBA program.

EMBA 716 - Managing Change

Credits: 1.5
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.

Prerequisites
Admission to EMBA program.
EMBA 717 - Corporate Governance

Credits: 1-3
Investigates past, present, and future of corporate governance. Focuses on relationships among shareholders, boards of directors, and top-level managers in examining governance process, with emphasis on rights and responsibilities of participants.

Prerequisites
Admission to EMBA program.

EMBA 722 - Consumer Behavior

Credits: 3
Examines behavioral science concepts to understand and predict marketplace behavior. Emphasizes applications of product and service strategies, as well as on market segmentation and targeting.

Prerequisites
Completion of EMBA core requirements or permission of instructor.

EMBA 724 - Marketing Communications

Credits: 3
Examines all forms of communication and sources of brand or company contacts as potential message channels in building and managing relationships with various publics. Focuses on an integrated planning process for these communication elements, including consumer and trade advertising, public relations, direct and database marketing, promotions, and sales presentations to achieve synergy in the overall marketing communications program. Emphasis is placed on appreciating the scope, strengths, and weaknesses of these tools.
EMBA 725 - Leadership

Credits: 1.5
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.

Prerequisites
Completion of EMBA core requirements or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0
When Offered
Elective - not offered regularly.

EMBA 727 - Applied Macroeconomics

Credits: 1-3
Examines how firm environment is shaped by economy and macroeconomic policy. Topics include business cycle, determinants of economic growth, influence of fiscal and monetary policies, and use of economic forecasts.

Prerequisites
Admission to EMBA program.

Hours of Lecture or Seminar per week
1-3
Hours of Lab or Studio per week
0
When Offered
Elective - not offered regularly.

EMBA 734 - Electronic Commerce
Credits: 1-3
Explores ongoing transformation of business activities and markets by computer and telecommunications technologies. Examines technology and its application in variety of functional areas and industry settings.

**Prerequisites**
Admission to EMBA program.

**Hours of Lecture or Seminar per week**
1-3

**Hours of Lab or Studio per week**
0

**When Offered**
Elective - not offered regularly.

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**EMBA 735 - Systems Thinking for Business Performance**

Credits: 1-3
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.

**Prerequisites**
Admission to EMBA program.

**Hours of Lecture or Seminar per week**
1-3

**Hours of Lab or Studio per week**
0

**When Offered**
Fall

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**EMBA 745 - Special Topics in Finance**

Credits: 1-3
In-depth examination of advanced topics in finance.

**Prerequisites**
Admission to EMBA program.

**Hours of Lecture or Seminar per week**
1-3

**Hours of Lab or Studio per week**
0

**When Offered**
Elective - not offered regularly.

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**EMBA 750 - Capstone Project: Action Learning Project**
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.

**Prerequisites**
Completion of EMBA core requirements or permission of instructor.

**Notes**
Course is repeatable within the term. Offered twice in spring semester for a total of 3 credit hours.

**EMBA 751 - Corporate Strategy and Policy**

Credits: 1.5
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.

**Prerequisites**
Admission to EMBA program.

**EMBA 752 - A Strategic View of the Firm**

Credits: 1-3
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 environment.

**Prerequisites**
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 755 - Special Topics in Management**

Credits: 1-3
In-depth examination of advanced topics in management.

**EMBA 765 - Special Topics in Management Information Systems**

Credits: 1-3
In-depth examination of advanced topics in management information systems.

**Prerequisites**
Admission to EMBA program.

**Hours of Lecture or Seminar per week**
1-3

**Hours of Lab or Studio per week**
0

**When Offered**
Elective - not offered regularly.

**EMBA 775 - Special Topics in Marketing**

Credits: 1-3
In-depth examination of advanced topics in marketing.

**Prerequisites**
Admission to EMBA program.

**Hours of Lecture or Seminar per week**
1-3

**Hours of Lab or Studio per week**
0

**When Offered**
Elective - not offered regularly.

**EMBA 791 - The Regulatory and Business Environment of the European Union**
Credits: 1.5
Considers contemporary interactions of businesses, government, and regulation. Seminars and presentations with business, government, and regulatory officials.

Prerequisites
Admission to EMBA program.

Hours of Lecture or Seminar per week
1.5
Hours of Lab or Studio per week
0
Grading
Regular graduate.
When Offered
Spring

EMBA 798 - International Business Environment

Credits: 1-3
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.

Prerequisites
Admission to EMBA program.

Hours of Lecture or Seminar per week
1-3
Hours of Lab or Studio per week
0
When Offered
Spring

ENGL 100 - Composition for Non-native Speakers of English

Credits: 4
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.

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
ENGL 101 - Composition

Credits: 3
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.

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

ENGL 201 - Reading and Writing about Texts

Credits: 3
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.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

ENGL 202 - Texts and Contexts

Credits: 3
Studies literary texts within the framework of culture. Examines texts within such categories as history, gender, sexuality, religion, race, class, and nation.

Notes
Builds on reading and writing skills taught in ENGL 201.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

ENGL 203 - Western Literary Tradition

Credits: 3
Major works of Western literature in historical progression. Focuses on writers such as Homer, Sophocles, Euripides, Dante,
Cervantes, Machiavelli, and Montaigne.

Notes
All readings are in modern English. Courses build on reading and writing skills taught in ENGL 201.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

**ENGL 204 - Western Literary Traditions**

Credits: 3
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.

Notes
Courses build on reading and writing skills taught in ENGL 201.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

**ENGL 302 - Advanced Composition**

Credits: 3
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.

Prerequisites
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 ENGL 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

**ENGL 309 - Introduction to Nonfiction Writing**

Credits: 3
Advanced practice in analyzing and writing nonfiction forms such as essay, profile, article, and technical or scientific report,
depending on student's interests.

Notes
Not to be taken concurrently with ENGL 399 or 489, and not to be taken by students who have taken ENGL 489. Not a remedial course.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

ENGL 311 - Writing Ethnography

Credits: 3
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.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

ENGL 322 - English Grammar

Credits: 3
Cross-Listed with LING 322
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.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

ENGL 325 - Dimensions of Writing and Literature

Credits: 6
Examines English as 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.

Notes
Open to all students. Required of those majoring or minoring in English, who should take ENGL 325 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 or minor. Regular class meetings; weekly lectures, performances, or readings.
ENGL 326 - General Linguistics

Credits: 3
See LING 326

ENGL 327 - Introduction to Cultural Studies

Credits: 3
Introduces interpretive practices associated with cultural studies.

ENGL 330 - Introduction to Literary Theory

Credits: 3
Introduces contemporary theories informing literary and cultural study such as deconstruction, poststructuralism, new historicism, feminism, psychoanalysis, and contemporary cultural studies.

ENGL 331 - Introduction to Documentary

Credits: 3
This introduction to the study of documentary considers fundamental concepts of form, style, and subject matter, ethical considerations, and theories of documentary, and includes close analysis of a series of representative film and television texts.
ENGL 332 - Introduction to Film

Credits: 3
Introduces film medium as an art form.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

ENGL 333 - Folklore of the Americas

Credits: 3
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.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

ENGL 334 - Literary Approaches to Popular Culture

Credits: 3
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.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

ENGL 335 - Shakespeare

Credits: 3
Twenty selected plays, emphasizes histories and comedies.

Hours of Lecture or Seminar per week
3
ENGL 336 - Shakespeare

Credits: 3
Twenty selected plays, tragedies, and romances.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

ENGL 337 - Special Topics in Myth and Literature

Credits: 3
Studies how traditional mythologies are reflected in English and American literature and other texts as themes, motifs, and patterns.

Notes
May be repeated once for credit when course content differs.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

ENGL 338 - Cultural Constructions of Sexualities

Credits: 3
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.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

ENGL 342 - Web Authoring and Design

Credits: 3
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.

**Hours of Lecture or Seminar per week**
3
**Hours of Lab or Studio per week**
0

## ENGL 343 - Textual Media

Credits: 3  
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.

**Hours of Lecture or Seminar per week**
3
**Hours of Lab or Studio per week**
0

## ENGL 344 - Introduction to Digital Writing in the Genres

Credits: 3  
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.

**Prerequisites**  
ENGL 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

## ENGL 345 - Special Topics: Literary Surveys

Credits: 3  
Advanced introduction to major movements and representative figures of two or more centuries or periods of American, British, European, or world literature.

**Notes**  
May be repeated once for credit when course content is different.

**Hours of Lecture or Seminar per week**
ENGL 349 - Global Voices

Credits: 3
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.

Prerequisites
45 credits.

Hours of Lecture or Seminar per week
3

ENGL 350 - The Idea of a World Literature

Credits: 3
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.

Prerequisites
45 credits.

Hours of Lecture or Seminar per week
3

ENGL 360 - Special Topics in Literature

Credits: 3
Studies literature by topics, such as women in literature, science fiction, and literature of the avant garde.

Notes
Topic changes each time course is offered. May be repeated when course content differs.
ENGL 363 - Special Topics in Literature

Credits: 3
Studies literature by topics, such as women in literature, science fiction, and literature of the avant garde.

Notes
Topic changes each time course is offered. May be repeated when course content differs.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

ENGL 368 - Beginnings of African American Literature Through 1865

Credits: 3
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.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

ENGL 369 - Women and Literature

Credits: 3
Explores experiences of women as both authors and subjects of imaginative literature.

Notes
May be repeated for credit when subtitle is different.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

ENGL 370 - African American Literature: Reconstruction to 1903

Credits: 3
Emphasizes several major writers from Reconstruction to beginning of 20th century, concluding with W.E.B. DuBois's The Souls

**ENGL 371 - African American Literature Through 1946**

Credits: 3
Focusing on fiction, poetry, drama, and autobiography, explores 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.

**ENGL 372 - Contemporary African American Literature**

Credits: 3
Encompassing 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.

**ENGL 375 - Ethnic American Literature**

Credits: 3
Studies particular ethnic American literatures. Focuses on literatures such as Asian American, Native American, Latino/a, Arab American, or Jewish American.

**Prerequisites**
3 credits of general education literature.

**Notes**
ENGL 380 - Recent American Fiction

Credits: 3
American short story writers and novelists from World War II to present, including Mailer, Barth, Cheever, Oates, Gass, Beattie, Updike, and Morrison.

ENGL 385 - Special Topics in Literary Nonfiction

Credits: 3
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. May be repeated once for credits when content is different.

ENGL 390 - Recent American Poetry

Credits: 3

ENGL 392 - Editing for Audience, Style, and Voice

Credits: 3
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.)

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**ENGL 396 - Introduction to Creative Writing**

Credits: 3
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.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**ENGL 397 - Poetry Writing**

Credits: 3
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.

**Prerequisites**
ENGL 396, or permission of instructor.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**ENGL 398 - Fiction Writing**

Credits: 3
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.

**Prerequisites**
ENGL 396, or permission of instructor.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0
ENGL 399 - Creative Nonfiction Writing

Credits: 3
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.

Prerequisites
ENGL 309 or 396, or permission of instructor

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

ENGL 400 - Literature of the Middle Ages

Credits: 3
Selected English narrative, dramatic, and homiletic literature written between 1300 and 1500, exclusive of Chaucer.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

ENGL 401 - English Poetry and Prose of the 16th Century

Credits: 3

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

ENGL 402 - English Poetry and Prose of the 17th Century

Credits: 3
English poetry and prose from 1603 to 1688, excluding Milton.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0
ENGL 404 - The Augustan Age

Credits: 3
English literature from late 17th century to mid-18th century. Includes Dryden, Rochester, Behn, Defoe, Swift, Pope, and Montagu.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

ENGL 405 - The Age of Sensibility

Credits: 3
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.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

ENGL 406 - English Poetry of the Romantic Period

Credits: 3

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

ENGL 407 - Prose and Poetry of the Victorian Period

Credits: 3
Poetry and nonfiction prose by such authors as Carlyle, Arnold, Tennyson, Elizabeth Barrett Browning, Robert Browning, Ruskin, Mill, and Wilde.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0
ENGL 408 - Special Topics: British Literary Periods

Credits: 3
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.

Notes
When subtitle is different, 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

ENGL 410 - Professional and Technical Writing

Credits: 3
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.

Prerequisites
ENGL 302.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

ENGL 414 - Honors Seminar

Credits: 3
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.

Prerequisites
Permission of department.

Notes
May be repeated for credit.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0
ENGL 415 - Honors Thesis Writing Seminar

Credits: 3
Gives students who wish to write an English honors thesis guidance in research methods, while offering opportunity to share and critique works in progress in workshop format. Students may take thesis seminar concurrently and in coordination with another approved course offered by English Department. In this case, the thesis of about 30 pages explores area covered by second course, and instructor in that course serves as thesis reader and advisor. Students receive credit for thesis seminar and second course; however, thesis work may substitute for some assigned work in second course by arrangement of instructors of thesis seminar and second course.

Prerequisites
Permission of department and ENGL 414 or 416.

Hours of Lecture or Seminar per week
3

ENGL 416 - Honors Independent Study

Credits: 1-3
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.

Prerequisites
Admission to honors program in English, and permission of instructor

Notes
Honors students concentrating in creative writing may use English 416 to replace 415 as second course in honors program.

Hours of Lecture or Seminar per week
0

ENGL 421 - Topics in Film History

Credits: 3
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.

Notes
May be repeated once for credit when topic is distinctly different.

Hours of Lecture or Seminar per week
3
ENGL 422 - Topics in Film Theory

Credits: 3
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.

Notes
May be repeated once for credit when topic distinctly different.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

ENGL 423 - Colonial and Federalist American Literature

Credits: 3
Works of first 200 years of American literature, including Edwards, Franklin, Irving, Cooper, and Bryant.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

ENGL 425 - Literature of the American Renaissance

Credits: 3
Major writers of American Renaissance (1830-1865), with emphasis on Emerson, Thoreau, Hawthorne, Melville, Whitman, Poe, Stowe, Douglass, and Dickinson.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

ENGL 429 - Special Topics: American Literary Periods

Credits: 3
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.
**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

**ENGL 431 - Medieval Intellectual Topics**

Credits: 3  
Cross-Listed with HIST 431/FRLN 431

Examines selected topic in intellectual history of Middle Ages.

**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

**ENGL 436 - Nineteenth-Century Continental Novels in Translation**

Credits: 3  
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.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**ENGL 437 - Twentieth-Century Continental Novels in Translation**

Credits: 3  
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.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0
ENGL 439 - Literature in English Other Than British and American

Credits: 3
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.

Notes
May be repeated once for credit when subject is different, with permission of department.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

ENGL 440 - English Renaissance Drama

Credits: 3
Major dramas and dramatists of English Renaissance, such as Lyly, Marlowe, Jonson, Middleton, Webster, and Ford.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

ENGL 443 - Restoration and Eighteenth-Century Drama

Credits: 3
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.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

ENGL 445 - English and Irish Drama of the Twentieth Century

Credits: 3
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.

Hours of Lecture or Seminar per week
3
ENGL 447 - American Drama of the Twentieth Century

Credits: 3
American drama of 20th century, with special attention to playwrights such as Glaspell, O'Neill, Miller, Williams, Fornes, and Albee.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

ENGL 448 - Modern Drama

Credits: 3
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.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

ENGL 449 - Special Topics in Drama

Credits: 3
Studies selected topics, periods, or playwrights.

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

ENGL 450 - English Novel of the 18th Century

Credits: 3
English novel from its beginnings through turn of 19th century. Covers works by Behn, Defoe, Haywood, Richardson, Fielding, Sterne, Burney, Smollett, and Austen.
ENGL 452 - Development of the American Novel to 1914

Credits: 3
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.

ENGL 453 - English Novel of the 19th Century

Credits: 3
Works by Dickens, Thackeray, the Brontes, Eliot, Trollope, and Hardy.

ENGL 454 - Development of the American Novel since 1914

Credits: 3
Works by Fitzgerald, Hemingway, Faulkner, Dos Passos, Wolfe, Bellow, and Nabokov.

ENGL 456 - English Novel of the Twentieth Century

Credits: 3
Works by Conrad, Forster, Lawrence, Joyce, Woolf, Greene, Lessing, Spark, and Fowles.
ENGL 458 - Advanced Fiction Writing Workshop

Credits: 3
Workshop; intensive practice in creative writing and study of creative process. Intended for students already writing original creative work.

Prerequisites
ENGL 398 and manuscript review.

Notes
Submit 8-10 pages of fiction to instructor. Enrollment is controlled. With permission of instructor may be taken a second time for credit.

ENGL 459 - Special Topics in Fiction

Credits: 3
Study of selected topics, periods, or authors.

Notes
May be repeated once for credit when subtitle is different, with permission of department.

ENGL 460 - Critical Study of Children's Literature

Credits: 3
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.

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ENGL 462 - English Poetry of the Twentieth Century

Credits: 3
Emphasizes work of Hardy, Yeats, Lawrence, Graves, Auden, Thomas, and Hughes. Work of fiction employing poetic techniques, such as Joyce's Ulysses, may also be studied.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

ENGL 463 - American Poetry of the Twentieth Century

Credits: 3
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.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

ENGL 464 - Advanced Poetry Writing Workshop

Credits: 3
Intensive practice in the craft of poetry and study of the imagination in creative process. Intended for students already writing original poetry.

Prerequisites
ENGL 397 and manuscript review.

Notes
Submit 8-10 pages of poetry to instructor. Enrollment is controlled. At discretion of instructor, technical exercises and assigned reading may be required. With permission of instructor, may be taken a second time for credit.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

ENGL 468 - Special Topics in Poetry

Credits: 3
Study of selected topics, periods, or poets.

Notes
May be repeated once for credit when subtitle is different, with permission of department.

**ENGL 471 - Chaucer**

Credits: 3
Major works of Chaucer, with emphasis on *The Canterbury Tales*.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**ENGL 472 - Spenser**

Credits: 3
Poetry of Edmund Spenser, with central emphasis on *The Faerie Queene*.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**ENGL 473 - Special Studies in Shakespeare**

Credits: 3
Study of one aspect of Shakespeare's art or critical issues surrounding his work.

**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

**ENGL 474 - Milton**

Credits: 3
Milton's major poetic works, with emphasis on *Paradise Lost*.
ENGL 477 - Special Topics: British Authors

Credits: 3
Study of one or two major figures in British literature.

Notes
May be repeated once for credit when subtitle is different, with permission of department.

ENGL 478 - Special Topics: American Authors

Credits: 3
Study of one or two major figures in American literature.

Notes
May be repeated once for credit when subtitle is different, with permission of department.

ENGL 479 - Ethnicity and Immigration in Folklore

Credits: 3
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.

ENGL 480 - Folklore of the Spirit World
Credits: 3
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.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

**ENGL 481 - Folk Arts and Folk Artists**

Credits: 3
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.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

**ENGL 489 - Advanced Nonfiction Writing**

Credits: 3
Workshop course. Intensive practice in advanced nonfiction writing; emphasizes writing for publication. Occasional special topics sections in such forms as autobiography and scientific writing.

Prerequisites
ENGL 309 or 399, or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

**ENGL 490 - Special Topics in Film**

Credits: 3
American and foreign films selected by type, period, or director with emphasis varying from year to year. Required viewings, student discussion, and written critiques.

Notes
May be repeated with permission of department.
ENGL 491 - Special Topics in Folklore

Credits: 3
Exploration of various aspects of folklore and folklife such as folklore and literature, folk arts, folk song, and material culture.

Notes
May be repeated once for credit when subtitle is different, with permission of department.

ENGL 492 - Science Fiction

Credits: 3
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.

ENGL 493 - Special Topics in Popular Literature

Credits: 3
Studies specific topic or theme in popular literature.

Notes
May be repeated once for credit when subtitle is different, with permission of department.

ENGL 494 - Special Topics in Criticism
Credits: 3
Studies selected approach to literary criticism, as announced, with exercises in critical analysis. Includes new criticism, structuralism, psychoanalysis, and Marxism.

Notes
May be repeated with permission of department.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

ENGL 495 - Literary Modes

Credits: 3
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.

Notes
May be repeated with permission of department.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

ENGL 496 - Topics in Rhetoric and Writing

Credits: 3
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.

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

ENGL 497 - Special Topics in Creative Writing

Credits: 3
Students must submit typed manuscript at least one week before registration. Workshop course. Intensive practice in creative writing and study of creative process. Concentrates on specialized literary type other than short story or poetry, such as
playwriting, screenwriting, children's literature, travel literature, autobiography, gothic novel, and translation. Concentration announced in department's Course Description Booklet before preregistration.

**Prerequisites**
ENGL 396 or equivalent, and permission of instructor.

**Notes**
Intended for students already writing original creative work. May be taken second time for credit.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

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**ENGL 498 - Internship: Special Topics**

Credits: 1-3
Under supervision of faculty advisor, students work as intern with site supervisor in agency of student's choosing, with advisor's permission.

**Prerequisites**
60 credits including 3 credits of 100-level English course; 6 credits of 200-level English courses; and 3 credits of English 302.

**Notes**
English majors need 6 additional credits of upper-level English courses. Non-English majors need 3 additional credits of upper-level English courses, and 3 credits of upper-level courses in the major. Unpaid, approved work-study positions at specific sites. For 3 credits, students work 120 hours on site and write 3,500 words, or the equivalent, given contract with advisor. 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 credit once with permission of department.

**Hours of Lecture or Seminar per week**
0

**Hours of Lab or Studio per week**
0

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**ENGL 499 - Independent Study**

Credits: 1-3
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.

**Prerequisites**
Permission of department and instructor.

**Notes**
Individualized section form required. With permission of department, course may be taken twice for maximum 6 credits. With permission of department, qualified undergraduates may enroll in 500-level courses for either undergraduate or reserved graduate credit.
ENGL 501 - Introduction to Professional Writing and Rhetoric

Credits: 3
Provides historical and theoretical background in professional writing and editing, including editing in literary tradition and organizational settings. Explores professional writing's emergence as field of scholarship and practice in seminar and practicum format.

ENGL 502 - Research Methods in Rhetoric and Professional Writing

Credits: 3
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.

ENGL 503 - Theory and Practice of Editing

Credits: 3
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.

Prerequisites
6 credits of English courses numbered above 300, including one of 309, 311, 396, 397, 398, 410, 458, 464, 489, or 497; or permission of department.
ENGL 504 - Internship in Writing and Editing

Credits: 3
Approved work-study positions in writing or editing established by department with specific employers.

Notes
Open to senior English majors, and graduate students pursuing MA in English or MFA. Contact English Department one semester before enrolling. Variable credit and prerequisites.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
0

ENGL 505 - Computer-Assisted Publications Writing and Design

Credits: 3
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 copy and original publications.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

ENGL 506 - Research for Narrative Writing

Credits: 3
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.

Prerequisites
ENGL 565 or 566, or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

ENGL 507 - Field Work in Applied Linguistics

Credits: 3
See LING 507.

Hours of Lecture or Seminar per week
ENGL 508 - Digital Rhetoric and Design

Credits: 3
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.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

ENGL 511 - Styles and Modes in Literary History

Credits: 3
English courses and permission of department; or baccalaureate degree. Historical consideration of principal styles, modes, and intellectual paradigms in literary and cultural texts.

Prerequisites
15 credits of advanced undergraduate

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

ENGL 512 - Issues in Literature and Philosophy

Credits: 3
Cross-Listed with PHIL 512

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.

Prerequisites
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
ENGL 513 - Advanced Special Topics in English

Credits: 3
Intensive study of topics involving literary or other texts such as film, television, opera, and folklore.

Prerequisites
15 credits of advanced undergraduate English courses and permission of department; or baccalaureate degree.

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

ENGL 514 - Theories of Comparative Literature

Credits: 3
Cross-Listed with CL 514

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.

Prerequisites
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

ENGL 520 - Descriptive Linguistics

Credits: 3
See LING 520.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

ENGL 521 - Applied Linguistics: Teaching English as a Second Language

Credits: 3
See LING 521
ENGL 522 - Modern English Grammar

Credits: 3
See LING 522.

ENGL 523 - Descriptive Aspects of English Phonetics and Phonology

Credits: 3
See LING 523.

ENGL 526 - Special Topics in the History and Criticism of Children's Literature

Credits: 3
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.

Notes
May be repeated once for credit with permission of instructor.

ENGL 551 - Literary Criticism
Credits: 3
Studies in selected critical theories pertinent to textual and cultural analysis.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**ENGL 555 - Introduction to Cinema Studies**

Credits: 3
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.

**Notes**
Students who have taken ENGL 332 may not take this course for credit.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**ENGL 564 - Form of Poetry**

Credits: 3
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.

**Prerequisites**
ENGL 464 or equivalent, and permission of instructor, except for MFA students in the concentration.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**ENGL 565 - Forms of Nonfiction**

Credits: 3
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.

**Prerequisites**
ENGL 489 or equivalent, and permission of instructor, except for MA and MFA candidates in English.
ENGL 566 - Forms of Fiction

Credits: 3
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.

Prerequisites
ENGL 458 or equivalent, and permission of instructor, except for MFA students in concentration.

ENGL 581 - Psycholinguistics

Credits: 3
See LING 581.

ENGL 582 - Second Language Acquisition

Credits: 3
See LING 582.

ENGL 591 - Special Topics in Folklore

Credits: 3
Explores various aspects of folklore and folklife such as narrative and story telling, folklore and literature, and song and arts.
ENGL 592 - Historical Studies of the English Language

Credits: 3
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.

Notes
May be repeated for credit with permission of department.

ENGL 604 - Internship in Folklore

Credits: 1-6
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.

Prerequisites
Undergraduate or graduate 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.

ENGL 608 - Craft Seminars

Credits: 3
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.
Prerequisites
ENGL 464, 458, or 489, and permission of instructor for non-MFA students.

Notes
Assignments vary with genre and specific topic. May be taken concurrently with ENGL 564, 565, 566.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

ENGL 610 - Proseminar in Teaching the Reading of Literature

Credits: 3
Methods of teaching literature. Includes study of methods of literary analysis, and ways of developing student responses to literature, with some classroom practice.

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

ENGL 611 - Studies in Rhetoric

Credits: 3
Reading and discussion of several major texts that address patterns of discourse, communication, and other issues of rhetoric.

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

ENGL 612 - Cultures of Professional Writing

Credits: 3
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.

Hours of Lecture or Seminar per week
ENGL 613 - Technical and Scientific Writing

Credits: 3
Intensive study of theory and practice of technical and scientific writing, with emphasis on writing for a 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.

ENGL 614 - Internship in the Teaching of Writing

Credits: 1-3
Internships provide experience working in teaching program such as school or writing center. Under direction of faculty member, students must secure cooperation of on-site supervisor.

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.

ENGL 615 - Proseminar in Composition Instruction

Credits: 3
Methods of teaching expository writing. Includes consideration of planning courses, practice in teaching and grading papers, and study of recent developments in teaching writing.

ENGL 616 - Nonfiction Writing Workshop
Credits: 1-6
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.

Prerequisites
ENGL 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.

Hours of Lecture or Seminar per week
1-6
Hours of Lab or Studio per week
0

ENGL 617 - Poetry Writing Workshop

Credits: 1-6
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.

Prerequisites
ENGL 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.

Hours of Lecture or Seminar per week
1-6
Hours of Lab or Studio per week
0

ENGL 618 - Fiction Writing Workshop

Credits: 1-6
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.

Prerequisites
ENGL 566, 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.

Hours of Lecture or Seminar per week
1-6
Hours of Lab or Studio per week
0
ENGL 619 - Special Topics in Writing

Credits: 3
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.

Prerequisites
Two graduate writing courses or permission of instructor, except for MFA students in concentration.

Notes
Concentration is announced in department's Course Description Booklet. Intended for students already writing original creative work. 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

ENGL 625 - British Medieval

Credits: 3
Selected literary authors, works, or movements from 1300 to 1500, studied in Middle English.

Notes
Content varies. May be repeated twice for credit with permission of department.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

ENGL 630 - Early Modern

Credits: 3
Selected literary authors, works, or movements of English Renaissance.

Notes
Content varies. May be repeated three times for credit with permission of department.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Description</th>
<th>Notes</th>
<th>Hours of Lecture or Seminar per week</th>
<th>Hours of Lab or Studio per week</th>
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</thead>
<tbody>
<tr>
<td>ENGL 635</td>
<td>Eighteenth-Century British</td>
<td>3</td>
<td>Selected English literary authors, works, or movements of 18th century.</td>
<td>Content varies. May be repeated twice for credit with permission of department.</td>
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<tr>
<td>ENGL 640</td>
<td>Nineteenth-Century British</td>
<td>3</td>
<td>Selected English literary authors, works, or movements of 19th century.</td>
<td>Content varies. May be repeated twice for credit with permission of department.</td>
<td>3</td>
<td>0</td>
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<tr>
<td>ENGL 645</td>
<td>Twentieth-Century British</td>
<td>3</td>
<td>Selected English literary authors, works, or movements of 20th century.</td>
<td>Content varies. May be repeated twice for credit with permission of department.</td>
<td>3</td>
<td>0</td>
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<tr>
<td>ENGL 650</td>
<td>Seventeenth-Century American</td>
<td>3</td>
<td>Selected literary authors, works, or movements of the &quot;new world&quot; before 1800.</td>
<td>Content varies. May be repeated once for credit with permission of department.</td>
<td>3</td>
<td>0</td>
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ENGL 655 - Nineteenth-Century American

Credits: 3
Selected American literary authors, works, or movements of 19th century.

Notes
Content varies. May be repeated twice for credit with permission of department.

ENGL 660 - Twentieth-Century American

Credits: 3
Selected American literary authors, works, or movements of the 20th century.

Notes
Content varies. May be repeated for credit with permission of department.

ENGL 661 - Advanced Survey in African American Literature

Credits: 3
Intensive study of period in African-American literature between 1800 and present, with focus to be determined by instructor. Several genres will be considered, including autobiography; fiction; drama; poetry; essays; and oral artifacts such as slave songs, spirituals, and hip-hop.

Notes
May be repeated for credit with department permission.
ENGL 665 - Texts in Global Contexts

Credits: 3
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.

Notes
Texts studied in English or English translation. 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

ENGL 670 - Visual Culture: Theories and Histories

Credits: 3
Advanced study in histories of visual representation including film, television, and video, and in theories of production and circulation of meanings in visual culture.

Prerequisites
Introductory film course, or permission of instructor.

Notes
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

ENGL 675 - Feminist Theory and Criticism

Credits: 3
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.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

ENGL 676 - Introduction to Cultural Studies
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.

**ENGL 684 - Proseminar in Poetry**

Credits: 3  
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.

**ENGL 685 - Selected Topics, Movements, or Genres of Literature in English**

Credits: 3  
Content varies.  
May be repeated for credit with permission of department.

**ENGL 686 - Special Topics in Linguistics**

Credits: 3  
See LING 686.

**ENGL 690 - Generative Phonology**
ENGL 691 - Theories of Language

Credits: 3
See LING 690.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

ENGL 692 - Phonology II

Credits: 3
See LING 692.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

ENGL 695 - Northern Virginia Writing Project Inservice Program

Credits: 1,2,3
Cross-Listed with EDUC 695

Offered at request of school division or other education agency to assist teachers in improving student writing and use of writing to learn.

Prerequisites
Admission to graduate program, or permission of department.

Notes
Content varies. May be repeated once for credit with permission of department.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
0
ENGL 696 - Northern Virginia Writing Project Teacher/Research Seminar

Credits: 3
Cross-Listed with EDUC 696

Prerequisites
ENGL 695/EDUC 695 or NVWP Summer Institute.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
0

ENGL 697 - Composition Theory

Credits: 3
Cross-Listed with EDUC 697

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.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

ENGL 699 - Workshop in English

Credits: 1-3
Concentrated workshops, educational tours, independent studies, and special seminars dealing with selected topics in writing, linguistics, film, electronic media, and literature written in English.

Prerequisites
Admission to graduate program, or permission of department.

Notes
All tours are optional, and may be replaced by specified work conducted on campus. May be repeated for credit with permission of department, but no more than 6 credits of ENGL 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
0
Hours of Lab or Studio per week
0
ENGL 701 - Research in English Studies

Credits: 3
Introduces research in English studies, including practice in library methods, writing critical bibliography, evaluating issues and problems, and surveying scholarly activities in department.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

ENGL 705 - Literary Theory and Criticism

Credits: 3
Major theories of literature and methods of analyzing and evaluating literary works.

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

ENGL 740 - Seminar in English/Cultural Studies

Credits: 3
Analyzes historical shifts in literary and cultural discourse or of relationships between literary and nonliterary elements of culture within specific historical moment.

Prerequisites
9 credits of graduate English courses including 701, or permission of department.

Notes
Major research paper required. Specific topics vary. 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

ENGL 750 - Advanced Workshop in Poetry Writing

Credits: 3
Open to MFA students only. Intensive practice in craft of poetry for experienced writers.
ENGL 751 - Advanced Workshop in Fiction Writing

Credits: 1-6
Open to MFA students only. Intensive practice in craft of fiction for experienced writers.

Notes
May be repeated for credit with permission.

Hours of Lecture or Seminar per week
1-6

ENGL 752 - Advanced Workshop in Nonfiction Writing

Credits: 1-6
Open to MFA students only. Intensive practice in craft of nonfiction for experienced writers.

Notes
May be repeated for credit with permission.

ENGL 785 - Semantics and Pragmatics

Credits: 3
See LING 785.

ENGL 786 - Syntax I
ENGL 786 - Syntax I

Credits: 3
See LING 786.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

ENGL 787 - Syntax II

Credits: 3
See LING 787.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

ENGL 797 - Projects in Professional Writing and Rhetoric

Credits: 3
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.

Prerequisites
ENGL 501, ENGL 502, and 6 credits of professional writing and rhetoric courses.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

Grading
S/NC

ENGL 798 - Directed Reading and Research

Credits: 1-3
Reading, research, and writing on specific project under direction of department member.

Prerequisites
Open only to degree students who have preregistered and have completed 15 credits, including ENGL 701.

Notes
Oral or written report required. MA students may repeat once for credit with permission of department. MFA students may present up to 12 credits of ENGL 798 for graduation, but no more than 3 may count toward completing literature requirement.
ENGL 799 - Thesis

Credits: 1-6
Students who take ENGL 798 to develop thesis topic and then elect thesis option receive 3 credits for ENGL 799 on completion of thesis. Students who do not take ENGL 798, or who take it to work on project unrelated to thesis, receive up to 6 credits for ENGL 799 on completion of thesis.

ENGL 800 - Studies for the Doctor of Philosophy in Education

Credits: variable
Program of studies designed by discipline director and approved by doctoral committee that prepares student for research and writing in area of interest of discipline director.

Prerequisites
Admission to PhD in education program to study in English.

Notes
Enrollment may be repeated.

ENGL 801 - New Developments in English

Credits: 3
Readings are from literary studies, composition and writing theory, and linguistics.

Notes
Designed for students in doctor of arts in community college education program. Focuses on major original texts that have influenced discipline of English in late 20th century.
ENGR 107 - Introduction to Engineering

Credits: 2
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.

Corequisite
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
F, S

ENGR 117 - Information Technology for Engineering

Credits: 3
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).

Hours of Lecture or Seminar per week
3

When Offered
f, s

ENGR 183 - Engineering Computer Graphics

Credits: 3
Fundamentals of engineering drawing, graphic communication, descriptive geometry, multiview projection, and graphical analysis. Introduces computer-aided drafting, visualization, pictorial views, and reading of engineering drawings.

Hours of Lecture or Seminar per week
2

Hours of Lab or Studio per week
3

ENGR 210 - Statics and Dynamics

Credits: 3
Covers general principles and fundamental concepts, including units of measurement; force vectors and their use, including vector operations; equilibrium of a particle; resultants of a system of forces; equilibrium of a rigid body; dry friction; center of
gravity and centroid; moments of inertia, including parallel axis theorem and radius of gyration; kinematics of a particle.

**Prerequisites**
Grade of C or better in PHYS 160 and MATH 114.

**ENGR 307 - Engineering Thermodynamics**

Credits: 3
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.

**Prerequisites**
Grade of C or better in MATH 213 and PHYS 266.

**ENGR 310 - Mechanics of Materials**

Credits: 3
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.

**Prerequisites**
Grade of C or better in ENGR 210

**ENGR 400 - Principles of Professional Practice in Engineering**
Credits: 3
Does not satisfy requirements for CEIE technical elective. Overview of all engineering disciplines focusing on engineering ethics and professionalism, need for lifelong learning, and professional licensure. Topic areas also include engineering science and mechanics, material science, electric circuits, chemistry and thermodynamics, engineering economics, and other fundamentals of engineering.

Prerequisites
Engineering majors within 30 hours of graduation.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0
When Offered
S

ENGR 401 - Professional Practice and Management in Engineering

Credits: 1
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.

Prerequisites
Senior standing in engineering.

When Offered
f, s

ENGR 490 - Human Practice of Engineering Design

Credits: 3
Study of engineering design and innovation emphasizing human aspects. Students directly involved in project with client for whom they must produce measurable innovation supported by engineering system. Students prepare through extensive readings and exercises, from which they will learn how to identify and listen for human concerns, action, breakdowns, and coordination.

Prerequisites
Senior standing with at least 90 credits in IT&E degree program; one of SYST 301, ECE 331, or CS 421; and permission of instructor.

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
Directed self-study of special topics of current interest in ENGR.

Prerequisites
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: 3
Topics of special interest to undergraduates.

Prerequisites
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

EOS 121 - Dynamic Atmosphere and Hydrosphere

Credits: 4
This natural science lab course is a systematic study of weather, climate, energy, and hydrologic systems viewed from a geospatial and global perspective. We will study 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.

Prerequisites
None.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
3
EOS 122 - Dynamic Geosphere and Ecosphere

Credits: 4
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.

Prerequisites
None.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
3

EOS 303 - GIS Applications for Earth Systems

Credits: 3
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.

Prerequisites
30 hours; and EOS 121, EOS 122 and IT 103, or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

EOS 304 - Population Dimensions of Global Change

Credits: 3
Cross-Listed with GEOG 304

Interdisciplinary course combining knowledge from social sciences and environmental science to develop global understanding of world population condition, issues, and related problems. Applies demographic concepts using GIS and quantitative methods. Satisfies general education syntheses requirement.

Prerequisites
30 credits of prior course work.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0
EOS 305 - Global Environmental Hazards

Credits: 3
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.

Prerequisites
30 hours and undergraduate status.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

EOS 306 - Sustainable Development

Credits: 3
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.

Prerequisites
60 hours; EOS 122 and EOS 305, or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

EOS 310 - Severe and Unusual Weather

Credits: 3
Introduces the student to a general survey of the atmosphere and the fundamentals of severe and unusual weather. Designed for students who generally have little physical science background and want to satisfy their intellectual curiosity about severe weather and complete basic science requirements. Mathematics is not emphasized. Appropriate equations are provided in an optional format during the course material for mathematically oriented students.

Prerequisites
30 hours.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0
**EOS 312 - Physical Climatology**

Credits: 3  
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.

**Prerequisites**  
30 hours; EOS 121 or equivalent, EOS 310 or GEOG 309, PHYS 243-244, or permission of instructor.

**Hours of Lecture or Seminar per week**  
3  
**Hours of Lab or Studio per week**  
0

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**EOS 320 - Air Pollution**

Credits: 3  
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.

**Prerequisites**  
30 hours.

**Hours of Lecture or Seminar per week**  
3  
**Hours of Lab or Studio per week**  
0

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**EOS 321 - Biogeography: Space, Time and Life**

Credits: 3  
**Cross-Listed with** BIOL 374  
A survey of the relationship between distribution of plants and animals on the earth surface and the physical geography and environmental characteristics.

**Prerequisites**  
EOS 122, GEOG 102 or permission of instructor.

**Hours of Lecture or Seminar per week**  
3  
**Hours of Lab or Studio per week**  
0
EOS 322 - Issues in the Global Change

Credits: 3
Provides the basis for evaluating existing and emerging issues in the environmental sciences at the regional and global scale, using interdisciplinary scientific principles. This objective is met by a combination of 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.

Prerequisites
30 hours and courses in chemistry, physics, ecology, and advanced mathematics.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

EOS 353 - Observations of the Earth and Its Climate

Credits: 3
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. The course 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.

Prerequisites
30 hours.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

EOS 354 - Data Analysis and Global Change Detection Techniques

Credits: 3
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.

Prerequisites
Competency in basic programming or tools used in data analysis.

Hours of Lecture or Seminar per week
3
**Hours of Lab or Studio per week**
0

**EOS 399 - Selected Topics in Global Change**

Credits: 3
Covers selected topics in global change not covered in fixed-content global change courses.

**Prerequisites**
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

**EOS 410 - Introduction to Hyperspectral Imaging**

Credits: 3
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.

**Prerequisites**
30 hours PHYS 243-244, 245-246, MATH 113 and 114, EOS 353, or permission of instructor.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**EOS 455 - Environmental Impact Assessment**

Credits: 3
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.
Prerequisites
60 hours; EOS 121, EOS 305, EVPP 377 and 6 hours of courses in ecology or environmental science, or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

EOS 456 - Introduction to Atmospheric Radiation

Credits: 3
The fundamental aspects of atmospheric radiation, including their essential roles in advanced remote sensing, atmospheric sciences, and global and environmental change.

Prerequisites
EOS 353 or GEOG 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

EOS 495 - Senior Research

Credits: 3
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.

Prerequisites
Open only to authorized majors with 90 credits.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
0

EOS 556 - Introduction to Atmospheric Radiation

Credits: 3
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.

Prerequisites
EOS 353 or GEOG 309 and a course in physics, or permission of instructor.
**EOS 600 - Communication Skills for Scientists**

Credits: 1  
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.

**Prerequisites**  
Graduate standing.

**Hours of Lecture or Seminar per week**  
3

**Hours of Lab or Studio per week**  
0

**EOS 650 - Introduction to GIS Algorithms and Programming**

Credits: 3  
Prepares students to program using object-oriented languages for GIS or in a GIS environment. A comprehensive programming training process, including computer programming, syntax, data types, data structure, control structures, and integrated programming environment (such as Python & JBuilder), will be introduced. Several technical aspects of GIS related to algorithms, such as file reading/writing and topology will be discussed.

**Prerequisites**  
Introductory GIS course (GEOG 553).

**Hours of Lecture or Seminar per week**  
3

**Hours of Lab or Studio per week**  
0

**EOS 656 - The Hydrosphere**

Credits: 3  
**Cross-Listed with** EVPP 652/GEOG 570

Components and transfer processes within the hydrosphere, which consists of aqueous envelope of Earth, including oceans, lakes, rivers, snow, ice, glaciers, soil moisture, groundwater, and atmospheric water vapor. Offers understanding of various components of the hydrosphere, spatial and temporal distributions, physics of transfer processes for redistribution, and appreciation of water's role in sustaining life and influencing global and regional energy and mass balance.
Prerequisites
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

EOS 657 - The Lithosphere

Credits: 3
Cross-Listed with GEOL 601/GEOG 671

Global-scale overview of lithosphere, the solid nonliving Earth, its materials, cycles, plate tectonic and geomorphic processes; and history, including interactions with hydrosphere, atmosphere, and biosphere, and methods of analysis. Offers understanding of materials, features, and landforms of solid Earth, and processes by which they formed.

Prerequisites
Graduate standing.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

EOS 670 - Introduction to Atmosphere & Weather

Credits: 3

This course will introduce the student to the fundamental principles upon which the atmospheric sciences are based and to provide quantitative description and interpretation of the wide range of atmospheric phenomena with an emphasis on sub-synoptic scales (i.e. weather and regional scale climate). One of the main goals of this course is not only to provide the basic knowledge of fundamentals of the atmosphere, but also to prepare students for the science of atmospheric modeling and simulations.

Prerequisites
MATH 214 and PHYS 262, or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

EOS 680 - Environmental Applications of Integrated Geographic Information Technologies
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.

**Prerequisites**
EOS 753, GEOG 550 or 585; or permission of instructor.

**Hours of Lecture or Seminar per week**
3

**EOS 684 - Selected Topics in Geospatial Intelligence**

Credits: 3
This is a course for students in the Geospatial Intelligence Graduate Certificate (GIGC) program. It is intended to cover select, specialized 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. The class comprises lectures, reading assignments, and student presentations.

**Prerequisites**
Students must be admitted to the Geospatial Intelligence Certificate program or have permission from the program’s academic director.

**Hours of Lecture or Seminar per week**
3

**EOS 685 - Capstone Course in Geoinformatics**

Credits: 3
A course for students completing their geospatial intelligence 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.

**Prerequisites**
12 credits in the geospatial intelligence certificate program or permission of program coordinator.

**Hours of Lecture or Seminar per week**
3

**EOS 704 - Spatial Analysis and Modeling of Population**
Intermediate-level, population geography course discussing demographic concepts and spatial dimensions of population. Features various indices, measures, and models commonly used in human geography.

**Prerequisites**
Prior courses in quantitative methods and GIS recommended.

**EOS 721 - Biogeography**

Credits: 3
Provides broad understanding of how physical geography and environment influence spatial and temporal distribution of plants and animals on Earth's surface.

**Prerequisites**
Courses in ecology, chemistry, and geology.

**EOS 722 - Regional and Global Issues in the Earth Sciences**

Credits: 3
Provides basis for evaluating existing and emerging issues in Earth sciences at regional and global scales, utilizing interdisciplinary scientific principles.

**Prerequisites**
Courses in ecology, chemistry, and physics.

**EOS 725 - Advanced Hydrosphere**

Credits: 3
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.
Prerequisites
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

EOS 740 - Hyperspectral Imaging Systems

Credits: 3
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.

Prerequisites
CSI 660 or equivalent, or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

EOS 747 - Satellite Data Reception and Product Generation

Credits: 3
Provides a practical experience on how to receive, process, and distribute remote-sensing data using an antenna-receiving station. Covers basic orbital mechanics, characteristics of satellite sensors and their limitations, and algorithms used to generate products from the raw measurements. Data mining techniques are presented for the analysis of large volume of data.

Prerequisites
EOS 753, or introductory remote-sensing course; computer programming; or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

EOS 753 - Observations of the Earth and Its Climate

Credits: 3
Provides requisite material to understand techniques of remote sensing and other observational methods as applicable to Earth science and global change. Surveys methodologies and their applications, including systematic study of how each part of electromagnetic spectrum is used to gather data about Earth. Describes limitations imposed by satellite engineering, sensor
limitations on data gathering, and a survey of data reduction specific to remote sensing applications. Also covers current research issues, including examples pertaining to atmosphere, land masses, and oceans. Includes discussions of current efforts by NASA and NOAA to provide integrated data gathering and dissemination systems.

Prerequisites
CSI 660 or introductory remote sensing course; environmental science, space science, physics, or chemistry undergraduate background; or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

EOS 754 - Earth Science Data and Advanced Data Analysis

Credits: 3
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.

Prerequisites
EOS 753 or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

EOS 756 - Physical Principles of Remote Sensing

Credits: 3
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.

Prerequisites
EOS 753 or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

EOS 757 - Techniques and Algorithms in Earth Observing and Remote Sensing
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.

Prerequisites
EOS 753 or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

EOS 758 - Earth Image Processing

Credits: 3
Intermediate-advanced level course focusing on digital processing of Earth images, with significant coverage of hyperspectral images, mathematical and algorithmic foundations, analysis procedures, and computational implementations. Emphasizes programming projects.

Prerequisites
EOS 753 and GEOG 580, plus knowledge of a computer language; or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

EOS 759 - Topics in Earth Systems Science

Credits: 3
Covers selected topics in Earth systems and global changes not covered in fixed-content Earth systems and global changes courses.

Prerequisites
Permission of instructor.

Notes
May be repeated.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

EOS 760 - Advanced Remote Sensing Applications
Focuses on applications of remote sensing in various important areas of Earth systems science, including analysis of surface radiation budget, land cover, inland and coastal waterways, and soil moisture. Details algorithms, techniques, and examples.

**Prerequisites**
EOS 753 or GEOG 580.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

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**EOS 771 - Algorithms and Modeling in GIS**

Credits: 3
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.

**Prerequisites**
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

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**EOS 772 - Distributed Geographic Information Systems**

Credits: 3
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.

**Prerequisites**
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

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**EOS 773 - Interoperability of Geographic Information Systems**

Credits: 3
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.
**EOS 777 - Remote Sensing of Natural Hazards**

Credits: 3
Provides an overview of major natural hazards, their governing dynamics and remote-sensing techniques used to study, forecast, and mitigate hazards.

**Prerequisites**
EOS 753 or GEOG 579 or GEOG 580; or permission of instructor.

**EOS 780 - Graduate Internship in Earth Systems and Geoinformation Sciences**

Credits: 1-6
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.

**Prerequisites**
Permission of program director and instructor.

**EOS 787 - Scientific Data Mining for Geoinformatics**

Credits: 3
Covers specialized data mining algorithms, geoscience data models, and data information systems. Emphasis is on domain-specific data mining algorithms suitable for spatial data and spatio-temporal data with geoscience and geoinformatics applications. Real geoscience data mining applications introduced in detailed applications.

**Prerequisites**
Competency in programming at the level of CSI 601-607 or permission of instructor.
**EOS 791 - Advanced Spatial Statistics**

Credits: 3  
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.

**Prerequisites**
GEOG 585 or STAT 535/554, or permission of instructor.

**EOS 792 - Seminar in Earth Systems Science**

Credits: 2  
**Cross-Listed with** EVPP 792/GEOG 792

Seminar for Earth systems science graduate students who have background in Earth's major systems.

**Prerequisites**
15 graduate credits, including CSI 655, EOS 656 and 657.

**Notes**
Intended to be capstone experience. Seminars presented by faculty and students; topics vary from semester to semester.

**EOS 796 - Directed Reading and Research**

Credits: 1-6  
Reading and research on specific topic in Earth systems and geoinformation sciences under direction of faculty member.

**Prerequisites**
Permission of instructor.

**Notes**
May be repeated as necessary.
EOS 798 - Research Project

Credits: 3
Reading project chosen and completed under guidance of graduate faculty member resulting in acceptable technical report.

Prerequisites
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.

EOS 799 - Master's Thesis

Credits: 1-6
Project chosen and completed under guidance of graduate faculty member, resulting in acceptable technical report (master's thesis) and oral defense.

Prerequisites
Admission to Earth systems science MS program, 12 graduate credits, and permission of instructor.

Notes
Graded S/IP. For students enrolled in Earth systems science master's program.

EOS 840 - Hyperspectral Imaging Applications

Credits: 3
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.

**Prerequisites**
CSI 660 or equivalent, or permission of instructor.

**EOS 854 - Air Pollution Meteorology and Dispersion**

Credits: 3
Covers the basic concepts, theories, and models of pollutant dispersal in the atmosphere and the related atmospheric systems
affecting dispersal of hazardous atmospheric releases.

**Prerequisites**
CLIM 710 or 711, or permission of instructor.

**EOS 855 - Introduction to Mesoscale Atmospheric Modeling**

Credits: 3
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.

**Prerequisites**
Permission of instructor.

**EOS 900 - Research Colloquium in Earth Systems and Geoinformation Sciences**

Credits: 1
**Cross-Listed with** EVPP 791/GEOG 791

Presentations in specific research areas of Earth systems and geoinformation sciences by faculty and staff, Mason faculty in
related programs, and professional visitors.

**Prerequisites**
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

**EOS 998 - Dissertation Proposal**

Credits: 1-12  
Covers development of research proposal that forms basis for doctoral dissertation, under guidance of dissertation director and doctoral committee.

**Prerequisites**
Permission of instructor.

**Notes**
May be repeated, but no more than 12 credits of EOS 998 may satisfy doctoral degree requirements.

**Hours of Lecture or Seminar per week**
0

**Hours of Lab or Studio per week**
0

**Grading**
S/IP

**EOS 999 - Doctoral Dissertation**

Credits: 1-12  
Doctoral dissertation research under direction of dissertation advisor.

**Prerequisites**
Permission of instructor.

**Notes**
May be repeated, but no more than total 24 credits in EOS 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**
S/IP
EVPP 110 - The Ecosphere: An Introduction to Environmental Science I

Credits: 4
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.

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
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.

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
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. Fulfills general education non-laboratory science requirement.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

EVPP 318 - Conservation Biology
EVPP 335 - People, Plants, and Culture

Credits: 3
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.

Prerequisites
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
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.

Prerequisites
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
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.

**Prerequisites**
60 credits.

**Notes**
This is a writing intensive class.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

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**EVPP 338 - Ecological Economics**

Credits: 3
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. Course requirements may include problem sets, written assignments, class participation, and short exams.

**Prerequisites**
60 units completed.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

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**EVPP 339 - Vertebrate Natural History**

Credits: 4
Introduces vertebrates with emphasis on systematics, life history, behavior, and ecology. Laboratory emphasis on identification and natural history of local fauna.

**Prerequisites**
BIOL 307 or equivalent.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
3

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**EVPP 350 - Freshwater Ecosystems**

Credits: 4
Cross-Listed with BIOL 350
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.

**Prerequisites**
CHEM 211/212, and either EVPP 110/111 or BIOL 103/104.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
3

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**EVPP 355 - Ecological Engineering and Ecosystem Restoration**

Credits: 4  
**Cross-Listed with BIOL 355**

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.

**Prerequisites**
CHEM 211, BIOL 307, PHYS 243 and/or permission of instructor

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
3

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**EVPP 361 - Introduction to Environmental Policy**

Credits: 3  
**Cross-Listed with GOVT 361**

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.

**Prerequisites**
30 credit hours.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0
EVPP 363 - Coastal Morphology and Processes

Credits: 4
Cross-Listed with EVPP 563/GEOL 363

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.

Prerequisites
GEOL 309, BIOL 309, or GEOL 317; or 9 credits in geography, including GEOG 309.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
3

EVPP 377 - Applied Ecology

Credits: 3
Cross-Listed with BIOL 377

Introduces ecosystem concepts and applications to natural and managed ecosystems.

Prerequisites
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 395 - Undergraduate Research in Environmental Science and Policy

Credits: 1-3
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.

Prerequisites
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
0
EVPP 396 - Directed Topic in Environmental Science and Policy

Credits: 1-4
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.

Prerequisites
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
Cross-Listed with EVPP 519/BIOL 508

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.

Prerequisites
BIOL/GEOL 309 or BIOL 449; 60 credit hours.

EVPP 421 - Marine Conservation

Credits: 3
Cross-Listed with EVPP 521/BIOL 507

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.

Prerequisites
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 451 - Fungi and Ecosystems

Credits: 3
Cross-Listed with EVPP 551; BIOL 459; BIOL 559

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.

Prerequisites
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

EVPP 480 - Sustainability in Action

Credits: 4
In the wake of global concerns about environmental change, the issue of attaining sustainability has become internationally important. To attain sustainability requires action at environmental, social, and economic levels. To provide students with valuable and tangible experience in practical aspects of realizing sustainability goals and to transfer theory into practice, this course allows students to engage in real-world, sustainability-related projects that provide benefits for a target community. Working in interdisciplinary teams, students will identify and attempt to solve a sustainability-related problem or address a sustainability-related need in a specific target community. Priority will be given to sustainability projects on the Mason campus or the local community. However, options for other relevant projects will be considered on a case-by-case basis.

Prerequisites
Completed or concurrent enrollment in all other required general education courses; 60 credit hours completed.

Notes
This is the capstone course for the Sustainability Minor – see Environmental Science and Policy department listing for details.

Hours of Lecture or Seminar per week
4

Hours of Lab or Studio per week
3
EVPP 490 - Special Topics in Environmental Science and Policy

Credits: 1-4
Studies selected topics in environmental science and policy using lectures, guest lectures, student presentations, or laboratory exercises.

Prerequisites
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
Cross-Listed with GEOL 303

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.

Prerequisites
MATH 105 or equivalent; and EVPP 110, GEOG 102, or GEOL 101 or equivalent.

Hours of Lecture or Seminar per week
0

Hours of Lab or Studio per week
6

EVPP 505 - Selected Topics in Environmental Science

Credits: 1-4
Topic depends on instructor's specialty.

Prerequisites
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 515 - Molecular Environmental Biology I

Credits: 3
Introduces molecular environmental biology covering basic concepts of molecular biology, molecular evolution, and bioinformatics, and application to problems in molecular and environmental biology.

Prerequisites
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 519 - Marine Mammal Biology and Conservation

Credits: 3
Cross-Listed with EVPP 419/Biol 508
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.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

EVPP 521 - Marine Conservation

Credits: 3
Cross-Listed with EVPP 421/Biol 507
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.

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  
Cross-Listed with GEOG 524

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.

Prerequisites
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  
Cross-Listed with ECON 895/GEOG 525

Advanced topics in environmental, natural resource, and ecological economics for noneconomist. Emphasizes sustainability, intergenerational equity, and economic-ecological feedbacks. Lecture, discussion with substantial student participation. Problem sets, class presentations, term paper.

Prerequisites
EVPP 524/GEOG 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  
Cross-Listed with CSS 643/GEOG 531

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.

Prerequisites
GEOG 550, or permission of instructor.

Hours of Lecture or Seminar per week
3
EVPP 536 - Ichthyology

Credits: 4
Cross-Listed with BIOL 536

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.

Prerequisites
Ecology course, or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
3

EVPP 538 - Mammalogy

Credits: 4
Cross-Listed with BIOL 538

Biology of mammals with emphasis on behavior, ecology, and conservation.

Prerequisites
Courses in zoology and ecology (BIOL 303 and 307, or equivalent).

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
3

EVPP 543 - Tropical Ecosystems

Credits: 4
Cross-Listed with BIOL 543

Terrestrial, aquatic, and marine ecosystems in the tropics, emphasizing plant communities, plant-animal interactions, and role of humans in tropics.

Prerequisites
Ecology course, and permission of instructor.

Notes
Requires field trip to tropics as part of lab.
EVPP 550 - Waterscape Ecology and Management

Credits: 3
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.

Prerequisites
Course in chemistry and course in ecology.

EVPP 551 - Fungi and Ecosystems

Credits: 3
Cross-Listed with EVPP 451; BIOL 459; BIOL 559
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.

Prerequisites
BIOL 304 or course in microbiology, or permission of instructor.

EVPP 555 - Lab in Waterscape Ecology

Credits: 1
Field and laboratory approaches to freshwater ecology with emphasis on study design, sampling methods, laboratory and data analysis, and report writing.

Prerequisites
EVPP 550 or permission of instructor.
EVPP 563 - Coastal Morphology and Processes

Credits: 4
Cross-Listed with EVPP 363/GEOL 363

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.

Prerequisites
Previous courses in geology, oceanography, marine science or physical geography; or permission of instructor.

EVPP 576 - Microbial Ecology of Soils

Credits: 3
Cross-Listed with BIOL 576

Surveys microbial ecology in surface and subsurface soils. Describes organisms and their function and interaction.

Prerequisites
Course in microbiology or permission of instructor.

EVPP 577 - Biogeochemistry: A Global Perspective

Credits: 3
Cross-Listed with BIOL 577

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.

Prerequisites
Course in ecology and course in chemistry; or permission of instructor.

**EVPP 581 - Estuarine and Coastal Ecology**

Credits: 3  
**Cross-Listed with** BIOL 581  

Emphasizes marine biology of estuarine and coastal habitats of Chesapeake Bay region, and factors affecting distribution and abundance of organisms.

**Prerequisites**  
Course in ecology and permission of instructor.

**EVPP 582 - Estuarine and Coastal Ecology Laboratory**

Credits: 1  
**Cross-Listed with** BIOL 582  

Provides training in field measurement of physical and chemical parameters, and collection and identification of local organisms. Emphasizes the practice of ecological field research.

**Prerequisites**  
EVPP 581/BIOL 581

**EVPP 607 - Fundamentals of Ecology**

Credits: 3  
**Cross-Listed with** BIOL 607  

Overview of concepts in physiological, population, community, ecosystem, biogeographical and human ecology.

**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  
**Cross-Listed with** BIOL 610

Provides basis for understanding proper application of bioremedial technologies to treatment of hazardous wastes. Includes evaluation of data to determine successful treatment.

**Prerequisites**  
Courses in microbiology and either organic chemistry or biochemistry; or permission of instructor.

**EVPP 613 - Environmental Geochemistry and Mineralogy**

Credits: 3  
**Cross-Listed with** GEOL 613

Explores hot topics and aids students in developing intellectual skills to identify key research problems. Students will also improve their writing and presentation skills.

**Prerequisites**  
Graduate standing.

**EVPP 615 - Molecular Environmental Biology II**

Credits: 4  
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.

**Prerequisites**
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**

Credits: 3
Through lectures, guest speakers, class discussions and assigned reading, 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 consider sustainability and emerging issues.

**Prerequisites**
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
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.

**Prerequisites**
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
Through lectures, case studies, and discussions, 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.

**Prerequisites**
8 graduate credits of ecology or permission of instructor.

**Hours of Lecture or Seminar per week**
EVPP 623 - Translating Environmental Policy into Action

Credits: 3
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.

Prerequisites
8 graduate credits in environmental science or environmental policy, or permission of instructor.

EVPP 626 - Environment and Development in Asia

Credits: 3
Guest lecturers, assigned reading, class discussions, and oral and written case studies to 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.

Prerequisites
8 graduate credits in policy process, international development, and ecology; or permission of instructor.

EVPP 627 - Environmental Policy in Latin America

Credits: 3
Guest lecturers, assigned reading, class discussions, and oral and written case studies to 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.

Prerequisites
8 graduate credits in policy process, international development, and ecology; or permission of instructor.
EVPP 628 - Environment and Development in Africa

Credits: 3
Guest lecturers, assigned reading, class discussions, oral and written case studies to 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.

Prerequisites
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
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.

Prerequisites
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
Cross-Listed with CSI 709; CSS 645; GEOG 631

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.

Prerequisites
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
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.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

EVPP 635 - Environment and Society

Credits: 3
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.

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
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
Examines human dimensions of climate change, biodiversity loss, ozone depletion, and related anthropogenic alterations of biosphere.

Prerequisites
Graduate standing, or permission of instructor.
EVPP 638 - Corporate Environmental Management and Policy

Credits: 3
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.

EVPP 641 - Environmental Science and Public Policy

Credits: 3
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.

Prerequisites
Course in ecology, or permission of instructor.

EVPP 642 - Environmental Policy

Credits: 3
Cross-Listed with PUAD 642

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.

Prerequisites
Course in ecology or permission of instructor.
EVPP 643 - Microbial Ecology

Credits: 4  
Cross-Listed with BIOL 643

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.

Prerequisites
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

Studies biotic and abiotic interactions that affect structure and composition of freshwater ecosystems. Emphasizes research literature.

Prerequisites
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

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.

Prerequisites
BIOL 307 or EVPP 377, or permission of instructor.

Hours of Lecture or Seminar per week
EVPP 647 - Wetland Ecology Lab and Field

Credits: 1
Use laboratory and field work to study the structure and function of wetland ecosystems.

Prerequisites/Corequisites
EVPP 646 (or previously EVPP 644), or permission of instructor.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
3

EVPP 648 - Population Ecology

Credits: 3
Cross-Listed with BIOL 648

Surveys ecological models and theory. Topics include population growth and regulation, competition, predator-prey, herbivore-plant, and parasite-host interactions, mutualism, and metapopulation ecology.

Prerequisites
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
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.

Prerequisites
Course in ecology or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
3
EVPP 652 - The Hydrosphere

Credits: 3
Cross-Listed with EOS 656/GEOG 570

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.

Prerequisites
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
Cross-Listed with BIOL 670

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.

Prerequisites
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
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.

Prerequisites
Permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

Credits: 3
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.

Prerequisites
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
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.

Prerequisites
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
Cross-Listed with CONF 682

This course 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.

Prerequisites
CONF 501, CONF 502 or permission of instructor

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

Credits: 3
Cross-Listed with CONF 683

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.

Prerequisites
EVPP 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
Cross-Listed with CONF 684

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.

Prerequisites
EVPP 682 and EVPP 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
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
EVPP 693 - Directed Studies in Environmental Science and Public Policy

Credits: 1-4
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.

Prerequisites
Permission of instructor and chair.

Notes
Short study plan required. May not be used to fulfill explicit undergraduate prerequisites for graduate work.

EVPP 741 - Advanced Topics in Environmental Science and Public Policy

Credits: 1-4
Studies selected advanced topics in environmental science and public policy. Lectures, guest lectures, student presentations, laboratory exercises.

Prerequisites
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.

EVPP 745 - Environmental Toxicology

Credits: 3
Cross-Listed with BIOL 745

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.
**Prerequisites**
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 791 - Colloquium in Earth Systems Science**

Credits: 1
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
**Cross-Listed with** EOS 792/GEOG 792

Seminar for Earth systems science graduate students with background in major systems. Capstone experience. Seminars presented by faculty and students.

**Prerequisites**
- 15 graduate credits; and courses on atmosphere, hydrosphere and lithosphere.

**Notes**
Topics vary from semester to semester.

**Hours of Lecture or Seminar per week**
- 2

**Hours of Lab or Studio per week**
- 0

**EVPP 793 - Research in Environmental Science and Public Policy**

Credits: 1-3
Library, laboratory, or field investigation under supervision of instructor.

**Prerequisites**
- 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  
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.

**Prerequisites**
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  
Experimental, observational, or theoretical research under instructor's supervision that culminates in production of thesis. Thesis work should be potentially publishable.

**Prerequisites**
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
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.

**Prerequisites**
Permission of student's doctoral committee, graduate program director and department chair.

**Hours of Lecture or Seminar per week**
0

**Hours of Lab or Studio per week**
0

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**EVPP 991 - Advanced Seminar in Environmental Science**

Credits: 2
Topics generally address interface between environmental science and public policy.

**Prerequisites**
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

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**EVPP 998 - Doctoral Dissertation Proposal**

Credits: 1-6
Work on research proposal that forms basis for a doctoral dissertation.

**Prerequisites**
Admission to doctoral candidacy.

**Grading**
S/IP

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**EVPP 999 - Doctoral Dissertation Research**

Credits: 1-12
Research on basic or applied problem in environmental science and public policy.
Prerequisites
Approval of dissertation proposal.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
0
Grading
S/IP

FAVS 100 - Film and Video Studies Colloquium

Credits: 1
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.

Prerequisites
FAVS majors only

Notes
Students completing their senior project will present their work as part of their last FAVS 100. FAVS majors must take three times.

Hours of Lecture or Seminar per week
1
Hours of Lab or Studio per week
2

FAVS 352 - Ethics of Film and Video

Credits: 3
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.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

FAVS 355 - Film Business Practices

Credits: 3
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.

**Prerequisites**
COMM 454 or equivalent ethics course.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

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**FAVS 365 - Documentary Filmmaking I**

Credits: 3
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.

**Prerequisites**
Satisfactory completion of COMM 355.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

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**FAVS 399 - Special Topics in Film and Video Studies**

Credits: 1-3
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

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**FAVS 450 - Internship in Film and Video Studies**

Credits: 3
On-the-job training in film and video studies through approved fieldwork study programs. Internships are arranged and supervised by the FAVS director.

**Prerequisites**
75 credits, 15 credits in core FAVS courses, and permission of FAVS director.
Notes
Required for all FAVS majors.

Hours of Lecture or Seminar per week
1
Hours of Lab or Studio per week
0

FAVS 499 - Senior Project

Credits: 3
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.

Prerequisites
Senior status in the film and video studies program.

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

FNAN 301 - Financial Management

Credits: 3
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.

Prerequisites
Credit for MIS 102; C or better in ECON 103, ACCT 203, and OM 210; sophomore standing.

Notes
Lecture, problems, and discussion. Requires attendance in weekly lectures and recitations.

The final exam for FNAN 301 will 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
FNAN 302 - Financial Analysis, Forecasting, and Valuation

Credits: 3
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.

Prerequisites
C or higher in FNAN 301, degree status.

Notes
Lecture, discussion, computer-assisted research.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

FNAN 311 - Principles of Investment

Credits: 3
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.

Prerequisites
C or higher in FNAN 301, degree status.

Notes
Lecture, discussion, and computer-assisted research.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

FNAN 321 - Financial Institutions

Credits: 3
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.

Prerequisites
C or higher in FNAN 301, degree status.

Notes
Lecture, discussion, and computer-assisted research.

Hours of Lecture or Seminar per week
3
FNAN 351 - Principles of Real Estate

Credits: 3
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.

Prerequisites
C or higher in FNAN 301, degree status.

Notes
Lecture, discussion, and computer-assisted research.

FNAN 401 - Advanced Financial Management

Credits: 3
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.

Prerequisites
C or higher in FNAN 301, degree status.

Notes
Lecture, discussion, and case analysis.

FNAN 411 - Investment Analysis and Portfolio Management

Credits: 3
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.

Prerequisites
C or higher in FNAN 301 and FNAN 311, degree status.
FNAN 412 - Futures and Options Markets

Credits: 3
Introduces options, commodity, and financial futures markets as they function to provide pricing mechanisms and alternative investment vehicles. Lecture, discussion, and computer-assisted research.

Prerequisites
C or higher in FNAN 301 and FNAN 311, degree status.

FNAN 421 - Money and Capital Markets

Credits: 3
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.

Prerequisites
C or higher in FNAN 301 and FNAN 321, degree status.

FNAN 440 - International Financial Management

Credits: 3
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.

Prerequisites
C or higher in FNAN 301 and 311, degree status.
FNAN 451 - Real Estate Finance

Credits: 3
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.

Prerequisites
C or higher in FNAN 301 and FNAN 351, degree status.

FNAN 454 - Real Estate Development

Credits: 3
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.

Prerequisites
C or higher in FNAN 351, degree status.

FNAN 462 - Honors Seminar in Finance

Credits: 3
Provides an in-depth study and analysis of contemporary developments and topics of interest in finance. The topics and format will vary. Enrollment in this course if limited and competitive.

Prerequisites
Finance major, degree status, senior standing, permission of the instructor.
**FNAN 491 - Special Topics in Finance**

Credits: 3  
Advanced study of special topics in finance.

**Prerequisites**  
Finance majors with at least 9 upper-level finance credits, degree status.

**Hours of Lecture or Seminar per week**  
3

**Hours of Lab or Studio per week**  
0

**FNAN 499 - Independent Study**

Credits: 1-3  
May be repeated to a maximum of 6 credits if topics vary. Degree status. Research and analysis of selected problems or topics in finance.

**Prerequisites**  
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.

**Hours of Lecture or Seminar per week**  
0

**Hours of Lab or Studio per week**  
0

**FREN 101 - Elementary French I**

Credits: 3  
For students with no knowledge of French. Introduces elements of grammar, vocabulary, oral skills, listening comprehension, and reading.

**Notes**  
Lab work required. 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**  
1
FREN 102 - Elementary French II

Credits: 3
Continuation of FREN 101.

Prerequisites
FREN 101, appropriate placement score, or permission of instructor.

Notes
Lab work required. 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
1

FREN 105 - Review of Elementary French

Credits: 3
Review for students who have studied French previously.

Prerequisites
Appropriate placement score, or permission of department.

Notes
Students may not receive credit for FREN 105 and FREN 101, 102, 109 or 110.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
1

FREN 109 - Intensive Elementary French

Credits: 6
Equivalent to FREN 101 and 102 taught in single semester.

Notes
Recommended for students who desire intensive introduction. Lab work required. 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
Introduces elements of grammar, vocabulary, oral skills, listening comprehension, and reading.

Notes
Lab work required. 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
1

FREN 201 - Intermediate French I

Credits: 3
Further development of skills in listening, speaking, reading, and writing.

Prerequisites
FREN 102, 105, and 109; appropriate placement score; or permission of department.

Notes
FREN 201 and 202 must be taken in sequence. Lab work required. 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
1

FREN 202 - Intermediate French II

Credits: 3
Applies language skills to reading, composition, and class discussion.

Prerequisites
FREN 201, appropriate placement score, or permission of department.

Notes
Lab work required. 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
1

FREN 209 - Intensive Intermediate French
Credits: 6
Equivalent to FREN 201 and 202 taught in single semester.

Prerequisites
FREN 102, 105, and 109; appropriate placement score; or permission of department.

Notes
Lab work required. 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
2

FREN 210 - Intermediate French

Credits: 3
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.

Prerequisites
FREN 110 or appropriate placement score.

Notes
Lab work required. 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
1

FREN 250 - Gateway to Advanced French

Credits: 3
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.

Prerequisites
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
Directed study tour of cultural and literary points of interest in France. Briefing sessions and reading selection given before the trip.

Prerequisites
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
0
Hours of Lab or Studio per week
0

FREN 309 - Reading and Writing Skills Development

Credits: 6
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.

Prerequisites
FREN 202, 250, or equivalent; appropriate placement score; or permission of instructor.

Hours of Lecture or Seminar per week
6
Hours of Lab or Studio per week
0

FREN 310 - Oral Proficiency in French

Credits: 3
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.

Prerequisites
FREN 250, appropriate placement score or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

FREN 325 - Major French Writers
FREN 329 - Problems of Western Civilization in French Literature

Credits: 3
Basic philosophical, moral, social, and political dilemmas reflected in literature of major French writers.

Prerequisites
ENGL 101 or equivalent, or permission of instructor.

Notes
Course work in English. May be taken toward fulfilling general requirement in literature for baccalaureate degrees. 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
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.

Prerequisites
FREN 309, appropriate placement score, or permission of instructor.

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.

**Prerequisites**
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

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**FREN 370 - French Civilization, Culture, and Literature: Ancient Gaul to 1789**

Credits: 3
Examines history, civilization (daily life, politics, science, philosophy, religion), culture (architecture, art, music, dance), and literature of France from Ancient Gaul to eve of French Revolution. Studies development of French nation and its people through written texts, visual arts, and music.

**Prerequisites**
FREN 309, 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 371 - French Civilization, Culture, and Literature: 1789 to the Present**

Credits: 3
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.

**Prerequisites**
FREN 309, 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 375 - French Civilization: From Ancient Gaul to the French Revolution**
Credits: 3
Studies contributions of France to world civilization. Emphasizes ideas, arts, sciences, and institutions.

Prerequisites
15 credits of French, or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0
When Offered
Offered in alternate years.

FREN 376 - French Civilization: From the Revolution to Contemporary France

Credits: 3
See FREN 375.

Prerequisites
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 377 - Survey of French Literature: Middle Ages to 1800

Credits: 3
French literature through the centuries, with reading and analysis of representative texts of major authors.

Prerequisites
15 credits of French, or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0
When Offered
Offered in alternate years.

FREN 378 - Survey of French Literature: 1800 to Present

Credits: 3
See FREN 377.

Prerequisites
15 credits of French, or permission of instructor.

**FREN 381 - Introduction to Literary Analysis**

Credits: 3
Structured approach to reading and analysis of French literary texts.

**Prerequisites**
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 I**

Credits: 3
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.

**Prerequisites**
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 392 - French for the Business World II**

Credits: 3
Continuing study of terminology used in business affairs, with attention to form and style of business documents. Oral and written practice of French used in everyday work situations. Students may use course to prepare for Paris Chamber of Commerce certificate in business French.

**Prerequisites**
FREN 391, or permission of instructor.

**Hours of Lecture or Seminar per week**
3
FREN 405 - French Literature of the Renaissance

Credits: 3
Development of humanistic tradition in France during 16th century, especially as reflected in works of Rabelais and Montaigne.

Prerequisites
18 credits of French, or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

FREN 413 - French Literature of the Seventeenth Century: Classical Drama

Credits: 3
Studies dramatic literature of 17th century.

Prerequisites
18 credits of French, or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

FREN 414 - French Literature of the Seventeenth Century: Prose and Poetry

Credits: 3
Reading and analysis of representative texts of major authors.

Prerequisites
18 credits of French, or permission of instructor.

Notes
May be taken toward fulfilling general requirement in literature for baccalaureate degrees.
FREN 421 - French Literature of the Eighteenth Century: Montesquieu and Voltaire

Credits: 3
Studies Montesquieu, Voltaire, and other writers of first half of century.

Prerequisites
18 credits of French, or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

FREN 422 - French Literature of the Eighteenth Century: Diderot and Rousseau

Credits: 3
Studies Diderot, Rousseau, and other writers of second half of century.

Prerequisites
18 credits of French, or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

FREN 431 - French Literature: 1800-1850

Credits: 3
Poetry, theater, and novels of Romantic and Parnassian movements.

Prerequisites
18 credits of French, or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

FREN 432 - French Literature: 1850-1900

Credits: 3
Poetry, theater, and novels of Realist, Naturalist, and Symbolist movements.

Prerequisites
18 credits of French, or permission of instructor.
FREN 441 - Twentieth-Century Prose Fiction

Credits: 3
Principal literary trends in contemporary French literature. Emphasizes evolution of novel from Proust and Gide to Beckett and "Nouveau Roman."

Prerequisites
18 credits of French, or permission of instructor.

FREN 442 - Twentieth-Century Drama and Poetry

Credits: 3
French drama from Surrealism to "Nouveau Theater." French poetry from Symbolism to contemporary poets.

Prerequisites
18 credits of French, or permission of instructor.

FREN 451 - Sub-Saharan African Literature

Credits: 3
Studies selected writers expressing culture and civilizations of French-speaking countries south of the Sahara.

Prerequisites
18 credits of French, or permission of instructor.

Notes
For non-Western credit.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0
FREN 452 - French-Canadian Literature

Credits: 3  
Studies Francophone literature of Canada with emphasis on contemporary works.

Prerequisites  
18 credits of French, or permission of instructor.

Hours of Lecture or Seminar per week  
3

Hours of Lab or Studio per week  
0

FREN 453 - Francophone Literature from North Africa

Credits: 3  
Studies Francophone literature of North Africa (the Maghreb) with emphasis on contemporary works.

Prerequisites  
18 credits of French, 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 - Caribbean Literature in French

Credits: 3  
Studies selected writers expressing culture and civilization of French speaking countries of Caribbean.

Prerequisites  
18 credits of French, or permission of instructor.

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
Intensive course to help students obtain fluency in oral and written French. Develops conversational skills and mastery of vocabulary. Class discussions and oral and written reports on current topics.

Prerequisites
18 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
Analyzes phonology, morphology, and syntax of modern standard French.

Prerequisites
18 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
Analyzes more complex aspects of French language and various stylistic processes. Develops writing skills through readings, discussion, and composition.

Prerequisites
18 credits of French, or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

FREN 470 - Topics in French Cinema
Credits: 3
Topics such as early days of French cinema, La Nouvelle Vague, women film directors, Quebecois, and African and Caribbean films selected by type, period, or director. Emphasis varies from year to year. Required viewing, student discussion, and written critiques.

Prerequisites
For film and media studies students: English 332, or permission of instructor; for French students, 18 credits in French, 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

**FREN 480 - Special Topics**

Credits: 3
Studies selected literary theme, topic, period, or genre.

Prerequisites
18 credits of French, or permission of instructor.

Notes
May be repeated once with permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

**FREN 490 - Independent Study**

Credits: 1-3
Research and analysis of selected problem in literature or linguistics in consultation with department member.

Prerequisites
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
0

Hours of Lab or Studio per week
0
FREN 491 - Independent Study

Credits: 1-3
Research and analysis of selected problem in literature or linguistics in consultation with department member.

Prerequisites
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
0
Hours of Lab or Studio per week
0

FREN 497 - Senior Honors Tutorial

Credits: 3
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.

Prerequisites
French majors with 90 credits, cumulative GPA of 3.00, and 3.00 in major field.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
0

FREN 498 - Senior Honors Tutorial

Credits: 3
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.

Prerequisites
French majors with 90 credits, cumulative GPA of 3.00, and 3.00 in major field.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
0
FREN 515 - Medieval French Literature

Credits: 3
Intensive study of outstanding literary works of Middle Ages.

Notes
Course work in French.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

FREN 517 - Studies in Seventeenth-Century Literature

Credits: 3
Selected writers, works, themes, or trends of French literature in classical era.

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 518 - Studies in Eighteenth-Century Literature

Credits: 3
Selected writers, works, themes, or trends of French literature in 18th century.

Notes
Content varies. Course work in French. 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 519 - Studies in Nineteenth-Century Literature

Credits: 3
Selected works, themes, genres, and authors of 19th-century French literature.
Notes
Content varies. Course work in French. 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 525 - Studies in Modern French Literature

Credits: 3
Selected writers, works, themes, or trends of French literature in modern era.

Notes
Content varies. May be repeated for credit with permission of department. Maximum 6 credits may be earned. Course work in French.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

FREN 550 - Special Topics

Credits: 3
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 560 - History of the French Language

Credits: 3
Evolution of French language from Latin to present-day French.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0
FREN 575 - Grammatical Analysis

Credits: 3
Studies characteristic features of contemporary French. Examines spoken and written French, including syntactic analysis, distributional analysis, and generative-transformational grammar. Emphasizes problem areas for American learners.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

FREN 576 - Advanced Translation

Credits: 3
Advanced work in translation of topics from social and political sciences and humanities. Comparative terminology, sight translation, and precise writing. Stress importance, function, and techniques of documentation in translation.

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 580 - Contemporary French Society and Culture

Credits: 3
Studies structure and evolution of society and culture of contemporary France.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

FREN 798 - Directed Reading and Research

Credits: 3
Reading and research on specific project under direction of department member.

Notes
Open only to degree students who have completed at least 18 credits. Oral or written report required.

Hours of Lecture or Seminar per week
0
FREN 799 - Thesis

Credits: 1-6
Students who take FREN 798 and then elect the thesis option receive 3 credits for FREN 799 after completing thesis. Students who do not take FREN 798 receive 6 credits for FREN 799 after completing thesis.

Hours of Lecture or Seminar per week
0

Hours of Lab or Studio per week
0

Grading
S/NC

FRLN 310 - Outside of Hitler's Shadow: Germany in its Global Context

Credits: 3
Critical examination of images of Nazis, Hitler, and Holocaust in media, popular culture. Course seeks to demystify and deglamorize such images while highlighting philosophical, cultural, and scientific contributions of Germany, Austria, and Switzerland.

Prerequisites
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
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.

Prerequisites
ENGL 101 and 45 credits, or permission of instructor.

Notes
All course work in English. May be taken toward fulfilling literature requirement of baccalaureate degrees. May be repeated twice when course content substantially differs, with permission of department.

Hours of Lecture or Seminar per week
3
FRLN 380 - Topics in the Sociopolitics of Language

Credits: 3
Topics will address 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.

Prerequisites
ENGL 101 and 45 credits, or permission of instructor.

FRLN 385 - Multilingualism, Identity, and Power

Credits: 3
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.

Prerequisites
Completion or concurrent enrollment in all other required general education courses.

FRLN 431 - Medieval Intellectual Topics

Credits: 3
Cross-Listed with ENGL 431/ HIST 431
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.

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
Use of basic bibliographical tools and methodologies for scholarly research in French, German, and Spanish. Taught in cooperation with university library staff.

Prerequisites
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
Critical approach and analysis of diverse texts such as poetry, drama, essay, and novel excerpts.

Prerequisites
Graduate standing, or permission of instructor. Advanced work 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
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 credit with permission of department.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0
FRLN 551 - Special Topics

Credits: 3
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 credit 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
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
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.

Prerequisites
Graduate standing or permission of department, language teaching methods course, and language teaching experience; or permission of instructor.

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  
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.

Prerequisites  
Graduate standing or permission of department, language teaching methods course, and language teaching experience; or permission of instructor.

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  
Internships are nonpaying, work-study positions that focus on the practice of translation. Qualified students placed with area institutions, interest groups, agencies, or corporations.

Prerequisites  
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  
In-service workshops, tours, and seminars on selected topics in literature, language, bilingualism, culture, methodology.

Notes  
May not usually be applied toward MA in modern and classical languages.

Hours of Lecture or Seminar per week  
0

Hours of Lab or Studio per week  
0

FRLN 620 - Literary Theory and Criticism

Credits: 3  
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
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
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
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

FRSC 420 - Forensic Toxicology
Credits: 3
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.

Prerequisites
Completion of forensic science foundation courses

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

FRSC 440 - Forensic Chemistry

Credits: 3
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.

Prerequisites
Completion of forensic science foundation courses

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

FRSC 460 - Forensic DNA Sciences

Credits: 3
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.

Prerequisites
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
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.

**Prerequisites**
Graduate standing.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**FRSC 510 - Crime Scene Analysis**

Credits: 3
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.

**Prerequisites**
Graduate standing.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**FRSC 520 - Toxicology**

Credits: 3
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.

**Prerequisites**
A 400-level course in molecular or cellular biology, 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
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.

**Prerequisites**
FRSC 540 - Chemical Analysis

Credits: 3
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.

Prerequisites
Undergraduate degree in chemistry or biology, or permission of instructor.

FRSC 550 - Issues in Forensic Anthropology

Credits: 3
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.

Prerequisites
Graduate standing.

FRSC 560 - Forensic DNA Sciences

Credits: 3
Cross-Listed with BINF 637

Intensive introduction to parameters affecting data QC and analysis, including factors arising from biochemistry, chemistry, genetics, statistics, instrumentation, and software.

Prerequisites
Graduate standing or permission of instructor.
FRSC 570 - Introduction to Biochemical Forensics

Credits: 3
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.

Prerequisites
A course in biochemistry or permission of instructor.

FRSC 600 - Forensics Seminar

Credits: 1
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.

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.

FRSC 610 - Forensics Research Project

Credits: 1-3
Research project in a current area of forensic science performed under the direction of a faculty member or affiliated forensic science professional.

Prerequisites
Admission to Forensic Science MS program.

Notes
May be repeated for a total of 3 credits.
FRSC 690 - Forensics Capstone Course

Credits: 3
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.

Prerequisites
Permission of instructor.

FRSC 799 - Master's Thesis

Credits: 1-6
Laboratory thesis research and writing under the guidance of a graduate faculty member. Comprehensive report (thesis) acceptable to student’s advisory committee is required.

Prerequisites
Permission of forensic science MS program director.

GAME 210 - Basic Game Design

Credits: 3
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.
Prerequisites
CS 105 or equivalent ethics course

Hours of Lecture or Seminar per week
3

GAME 230 - History of Computer Game Design

Credits: 3
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

GAME 231 - Computer Animation for Games

Credits: 3
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.

Prerequisites
GAME 210

Hours of Lecture or Seminar per week
3

GAME 232 - Online Gaming and File Sharing

Credits: 3
History, practice, and design of online games and file sharing protocols. Past and current interactive file sharing protocols will be studied including chat applications, WikiMedia, and peer-to-peer network protocols. 2D and 3D virtual social networking and computer/console real-time team gaming design will be covered.

Prerequisites
GAME 231

Hours of Lecture or Seminar per week
3
GAME 250 - Music for Film and Video

Credits: 3
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.

Prerequisites
MUSI 100 and 101

GAME 310 - Game Design Studio

Credits: 3
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.

Prerequisites
GAME 230, 231 and 250

GAME 330 - Computer Game Platform Analysis

Credits: 3
Examine past and current consumer gaming platforms and consoles including handheld, mobile, cell phone, desktop, and commercial consoles. Analysis will include media types, wired and wireless protocols, compiling toolkits, and storage devices. Limitations and advantages of most commercially produced platforms will be examined and compared.

Prerequisites
GAME 231 and 232
GAME 332 - Story Design for Computer Games

Credits: 3
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.

Prerequisites
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
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.

Prerequisites
GAME 250

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

GAME 398 - Advanced Game Design Animation

Credits: 3
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.

Prerequisites
GAME 231

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

GAME 399 - Special Topics
Credits: 1-4
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.

Hours of Lecture or Seminar per week
1-4

Hours of Lab or Studio per week
0

GAME 410 - Advanced Game Design Studio

Credits: 3
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.

Prerequisites
GAME 310

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

GAME 431 - Consumer Game Platform Analysis

Credits: 3
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.

Prerequisites
GAME 330

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

GAME 490 - Senior Project

Credits: 3
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.

Prerequisites
Completion of 60 credits in major
GAME 491 - Internship

Credits: 4
Placement in an appropriate internship within a program approved by a federal, state or commercial game design/publishing agency or firm.

Prerequisites
Completion of 60 credits in major

Notes
180 hours of internship on-site work must be completed

GAME 492 - Independent Study

Credits: 1-6
Advanced research, computer game design, or exploration of topical studies in computer game design.

Notes
May be repeated for a maximum of 12 credits

GCH 205 - International Health

Credits: 3
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.

Hours of Lecture or Seminar per week
3
GCH 210 - African American Health

Credits: 3
Overview of diseases and health behaviors disproportionately affecting African Americans. Addresses health disparities linked to infectious and chronic disease and mental health factors affecting this population.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

GCH 295 - Nutrition for Health Professionals

Credits: 3
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.

Prerequisites
One semester of science or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

GCH 300 - Introduction to Public Health

Credits: 3
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.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

GCH 310 - Health Behavior Theories
Credits: 3
Introduces health behavior from a global perspective. Various theoretical models are evaluated for understanding health and illness behavior. Case studies examine the nature of health from planning, implementing, and evaluating programs to prevention and treatment of health programs.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

GCH 332 - Health and Disease

Credits: 3
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.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

GCH 350 - Health Education

Credits: 3
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
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.

Prerequisites
Statistics course

Hours of Lecture or Seminar per week
3
GCH 405 - International Health Policy and Practice

Credits: 3
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.

Prerequisites
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
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.

Prerequisites
GCH 332, 350

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

GCH 412 - Fundamentals of Epidemiology

Credits: 3
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 420 - Strategies for Nutrition Education
Credits: 3
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.

**Prerequisites**
GCH 295 or permission of instructor.

**Hours of Lecture or Seminar per week**
3
**Hours of Lab or Studio per week**
0

**GCH 421 - Community Nutrition**

Credits: 3
Focuses on nutrition and health problems of specific community settings, and examines practices of nutrition services in various communities.

**Prerequisites**
GCH 295 or permission of instructor.

**Hours of Lecture or Seminar per week**
2
**Hours of Lab or Studio per week**
1

**GCH 422 - Nutrition throughout the Life Cycle**

Credits: 3
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.

**Prerequisites**
GCH 295 or permission of instructor.

**Hours of Lecture or Seminar per week**
3
**Hours of Lab or Studio per week**
0

**GCH 423 - Nutrition and Chronic Illnesses**

Credits: 3
Examines nutrient needs related to specific chronic illnesses, including cardiovascular disease, cancer, obesity, and diabetes. Focuses on principles of nutritional therapy and prevention.

**Prerequisites**
GCH 295 or permission of instructor.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

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**GCH 450 - Culture, Sexuality and the Global AIDS Epidemic**

Credits: 3
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.

**Prerequisites/Corequisites**
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

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**GCH 460 - Public Health Research and Methods**

Credits: 3
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.

**Prerequisites**
STAT 250 or equivalent

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

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**GCH 466 - Nutrition and Weight Management: Obesity, Anorexia, and Bulimia**

Credits: 3
Focuses on the physiological, emotional, genetic, and societal and cultural factors that influence the relationship between eating and weight regulation.

**Prerequisites**
GCH 295, GCH 332, or approval of instructor.

**Hours of Lecture or Seminar per week**

GCH 480 - Health Maintenance and Health Aspects of Aging
Credits: 3
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
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
Cross-Listed with NURS 496
Examines magnitude of problem of violence globally and more specifically within the United States. Discussion and reflective activities engage students in the learning process.

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
Involves a seminar and an internship in a community health organization.

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.

Hours of Lecture or Seminar per week
2
Hours of Lab or Studio per week
8

GCH 499 - Independent Study in Global and Community Health

Credits: 1-3
Provides individual study of a particular problem area in global and community health research, theory development, or education under the direction of faculty.

Prerequisites
Permission of instructor

Notes
May be repeated for maximum 6 credits.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
0

GCH 502 - U.S. Role in Global Health, Nutrition, and Population

Credits: 3
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.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

GCH 506 - Clinical Exercise Physiology

Credits: 3
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.

**Prerequisites**
Bachelor's degree, and 8 credits in anatomy and physiology; or permission of instructor.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

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**GCH 510 - Scientific Basis for Pain, Fatigue, and Suffering in Chronic Illness and Disability**

Credits: 3
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.

**Prerequisites/Corequisites**
Undergraduate course in statistics

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

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**GCH 520 - Global Health Perspectives on Alcohol**

Credits: 3
Using a multidisciplinary approach, this course will investigate the impact of beer and wine in health and society from a global perspective. Caters to students interested in understanding the intersections of food science, culture, history, and public health.

**Prerequisites**
Must be at least 21 and have basic chemistry and/or microbiology

**Notes**
Will include off campus field trips.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

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**GCH 530 - Nutrition: A Global Perspective**
Examines malnutrition and how it occurs by looking at several situations from around the world. Covers how nutrition can affect society and community, and examines benefits of well-nourished population.

Notes
For students from a variety of disciplines.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

GCH 543 - Global Health: Trends and Policies

Credits: 3
Covers today's health challenges and their various social, economic, and epidemiological causes; role and likely success of information and technology transfer; primary preventive health care; social awareness; and intervention in alleviating problems.

Notes
Lecture, discussion.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

GCH 550 - Introduction to Rehabilitation Science

Credits: 3
Introduces the field of rehabilitation science. In addition, the roles of various specialties (including physiatry, occupational therapy, physical therapy, speech pathology, psychology, vocational counseling, and engineering) in rehabilitation science will be examined.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

GCH 551 - Research Methods in Rehabilitation Science

Credits: 3
Explores quantitative and qualitative research methods used in rehabilitation science. Designed to assist in development of basic theoretical and practical knowledge of methodological principles and techniques necessary for implementation of research endeavors.

Corequisite
GCH 601 or graduate course in applied statistics
**GCH 555 - Human Biology**

Credits: 3  
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  
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.

**Prerequisites**  
An undergraduate community health course.

**GCH 566 - Nutrition and Weight Management**

Credits: 3  
Focuses on the physiological, emotional, genetic, and societal/cultural factors that influence the relationship between eating and weight regulation.

**Prerequisites**  
GCH 295 or other introductory nutrition course.

Credits: 3  
Cross-Listed with NURS 571

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.

Hours of Lecture or Seminar per week  
3

Hours of Lab or Studio per week  
0

GCH 583 - Food and Culture: Biocultural Perspectives on Food and Nutrition

Credits: 3  
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 analyses.

Prerequisites  
GCH 295 or permission of instructor.

Hours of Lecture or Seminar per week  
3

Hours of Lab or Studio per week  
0

GCH 585 - Care Management of Persons with Alzheimer's Disease and Related Disorders

Credits: 3  
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.

Hours of Lecture or Seminar per week  
3

Hours of Lab or Studio per week  
0

GCH 590 - International Health Organizations

Credits: 3  
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 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
Cross-Listed with HAP 594/NURS 594

Selected topics analyzing specialized areas in health care.

**Notes**
Content varies. Lecture, seminar, laboratory, and workshops.

**Hours of Lecture or Seminar per week**
0

**Hours of Lab or Studio per week**
0

**GCH 601 - Introduction to Biostatistics**

Credits: 3
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
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.

**Prerequisites**
Admission to a graduate program or permission of instructor.

**Hours of Lecture or Seminar per week**
3
GCH 605 - Social Epidemiology

Credits: 3
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.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

GCH 610 - Foundations of Health Education and Behavior

Credits: 3
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 - Planning, Implementing, and Evaluating Health Promotion Programs

Credits: 3
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.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

GCH 620 - Psychosocial Aspects of Rehabilitation
Credits: 3
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.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**GCH 637 - Normal Aging and Health Deviations**

Credits: 3
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 659 - Health Care of Aging Persons with Chronic Illnesses**

Credits: 3
Focuses on biological, psychological, and sociocultural aspects of aging and chronic illness. Examines functional capacity and capacity for self care.

**Prerequisites**
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
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.

**Prerequisites**
GCH 690 - Independent Study

Credits: 1-3
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
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 702 - Biobehavioral Aspects of Health

Credits: 3
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.

Prerequisites
GCH 601, research methods course or equivalent

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

GCH 710 - Principles of Applied Physiology I
Credits: 3
Examines the primary bio-regulatory and communication systems. Part one of a detailed study of physiology for graduate students interested in health and human movement, chronic illness, and disability.

**Prerequisites**
One-year introductory biology sequence with labs or two-semester course sequence in anatomy and physiology.

**Notes**
General chemistry recommended but not required.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

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**GCH 711 - Principles of Applied Physiology II**

Credits: 3
Explores general systemic function. Part II continuation of a detailed study of physiology for graduate students interested in health and human movement, chronic illness, and disability.

**Prerequisites**
GCH 710

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

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**GCH 712 - Introduction to Epidemiology**

Credits: 3
Introduction to epidemiology and health service research as body of knowledge and a method for analyzing health problems. Students learn the role of health services research and epidemiology in policy and evidence-based management and clinical practice. Students design experiments, analyze secondary data, and evaluate impact of programs on health outcomes.

**Prerequisites**
HAP 730 or comparable other as approved by instructor. 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

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**GCH 714 - Epidemiology for Nursing Practice**
Credits: 3
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.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

GCH 722 - Infectious Disease Epidemiology

Credits: 3
Infectious disease epidemiology is the study of the distribution and determinants of infectious diseases in populations. Covers agent, host, and environmental characteristics; the infectious transmission process; epidemiological study, design, and analysis; surveillance, outbreak investigation, and disease control; and advanced techniques such as mathematical modeling and spatial analysis.

Prerequisites
GCH 712

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

GCH 726 - Advanced Seminar in Epidemiology

Credits: 3
Develops epidemiological skills through completion of an original research project. Focuses on epidemiological methodology and analysis, critical review of the literature, and scientific writing.

Prerequisites
GCH 601, GCH 712, or equivalent and advanced epidemiology course and permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

GCH 732 - Chronic Disease Epidemiology

Credits: 3
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.

**Prerequisites**
GCH 712 or approved epidemiology course.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

### GCH 740 - Applied Physiology: Cardiorespiratory System

Credits: 3
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.

**Prerequisites**
GCH 550 or EFHP 610 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).

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

### GCH 745 - Metabolic Basis of Disability

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.

**Prerequisites**
Undergraduate level anatomy and physiology.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

### GCH 746 - Musculoskeletal System and Disability

Credits: 3
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.
Prerequisites
Undergraduate-level anatomy, physiology, and calculus

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

GCH 751 - Nutritional Assessment, Monitoring, and Surveillance

Credits: 3
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.

Prerequisites
GCH 530 or approved graduate nutrition course.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

GCH 752 - Nutritional Epidemiology

Credits: 3
Introduces students to the principles of epidemiology and their application to nutrition. Examines the methodologies and interpretation of dietary assessment and the design, conduct, analysis, and interpretation of epidemiologic studies related to nutrition, particularly the relationship between nutritional status, diet, and disease.

Prerequisites
GCH 712

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

GCH 760 - Rehabilitation Science Colloquium

Credits: 1
Public forum for the presentation and discussion of contemporary issues in the field of rehabilitation science.

Prerequisites
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.

Hours of Lecture or Seminar per week
1

Hours of Lab or Studio per week
0

GCH 770 - Gerontology Practicum I

Credits: 3
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.

Prerequisites
All core course work; corequisite for gerontology tract 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

GCH 771 - Gerontology Practicum II

Credits: 3
Gerontological theoretical concepts applied in implementation and evaluation. Uses case study analyses to explore problem-solving approaches.

Prerequisites
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 or Studio per week
3

GCH 788 - Public Health Research I
Credits: 3
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.

Prerequisites
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

GCH 789 - Public Health Research II

Credits: 3
Provides students with skills to complete their research projects and write the master's thesis.

Prerequisites
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

GCH 795 - Special Topics in Global and Community Health

Credits: 1-3
Advanced special topics course to address in-depth study of contemporary areas of global and community health insufficiently covered in other courses.

Prerequisites
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
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.

Prerequisites
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
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.

Prerequisites
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
Cross-Listed with NURS 804

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.

Prerequisites
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
Cross-Listed with NURS 805

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.

Prerequisites
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
Cross-Listed with NURS 806

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.

Prerequisites
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
Cross-Listed with NURS 807

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.

Prerequisites
Doctoral-level course in research design and statistics. Completion of GCH/NURS 805 or 806 is highly recommended.

Notes
Completion of GCH/NURS 805 or GCH/NURS 806 is highly recommended.
GCH 808 - Outcomes Measurement in Rehabilitation Science

Credits: 3
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.

Prerequisites
GCH 550 and GCH 551

GCH 940 - Independent Study

Credits: 1-6
In-depth study of selected area of health under the direction of faculty.

Prerequisites
Enrollment in PhD program and permission of instructor

Notes
May be repeated as needed, up to a maximum of 24 credits.

GCH 999 - Dissertation Research

Credits: 1 to 9
Dissertation research on a specific topic under the direction of a faculty member.

Prerequisites
Enrollment in PhD program in rehabilitation science or permission of graduate director

Notes
May be repeated, up to a maximum of 24 credits.
GEOG 101 - Major World Regions

Credits: 3
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.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

GEOG 102 - Physical Geography

Credits: 3
Interrelated processes affecting global distribution and character of climate, soils, vegetation, hydrology, and landforms. Includes elements of mapping (natural science credit).

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

GEOG 103 - Human Geography

Credits: 3
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.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

GEOG 110 - Maps and Mapping

Credits: 3
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.
**GEOG 300 - Quantitative Methods for Geographical Analysis**

Credits: 3  
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.

**Prerequisites**  
30 credits, including GEOG 102 and 103, or permission of instructor; and permission of department.

**GEOG 301 - Political Geography**

Credits: 3  
Distribution and effects of power on landscape, particularly on national and global scales.

**Prerequisites**  
30 credits.

**GEOG 303 - Conservation of Resources and Environment**

Credits: 3  
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.

**Prerequisites**  
30 credits, and completion or concurrent enrollment in all other required general education courses.

**Notes**  
Synthesis course.
GEOG 304 - Geography of Population

Credits: 3  
Cross-Listed with EOS 304

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.

Prerequisites
30 credits.

Notes
Synthesis course.

GEOG 305 - Economic Geography

Credits: 3  
Analyzes pattern of distribution of world economic activity, spatial economics behind this pattern, and influence of distribution on other spatial systems.

Prerequisites
30 credits.

GEOG 306 - Urban Geography

Credits: 3  
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.

Prerequisites
30 credits.
GEOG 308 - Field Mapping Techniques

Credits: 3
Basic techniques for collecting and recording spatial field data, including topographic maps, compass, transit, alidade, and geographic positioning systems. Includes field work.

Prerequisites
MATH 105, GEOG 102 or 101, and 30 credits.

GEOG 309 - Introduction to Meteorology and Climate

Credits: 3
Elements of meteorology; analysis of world distribution of meteorological controls as bases of regional climatic variations (natural science credit).

Prerequisites
GEOG 102 or equivalent, or permission of instructor.

GEOG 310 - Introduction to Digital Cartography

Credits: 4
Origins, principles, and methods of thematic map design and production. Principles of graphic design, data compilation, analysis, and display.

GEOG 311 - Introduction to Geographic Information Systems
Credits: 3  
Fundamental concepts and theories for appropriate use of geographic information systems (GIS). Discusses basic GIS functionality and applications in various fields.

**Hours of Lecture or Seminar per week**  
3

**Hours of Lab or Studio per week**  
0

**GEOG 315 - Geography of the United States**

Credits: 3  
Diversity of U.S. physical and cultural landscapes.

**Prerequisites**  
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

**GEOG 316 - Geography of Latin America**

Credits: 3  
Regional survey of physical resources, populations, cultural characteristics, and economic activities in Latin America.

**Prerequisites**  
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

**GEOG 320 - Geography of Europe**

Credits: 3  
Environmental, economic, social, and political factors influencing regional structure of Europe.

**Prerequisites**  
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
GEOG 325 - Geography of North Africa and the Middle East

Credits: 3
Environmental, economic, and social factors of differentiation of regional structure and distribution of resources in North African and Middle Eastern countries.

Prerequisites
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

GEOG 330 - Geography of the Soviet Succession States

Credits: 3
Analyzes geographic factors involved in history, economic development, and geopolitical situation of the former Soviet Union.

Prerequisites
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

GEOG 333 - Issues in Regional Geography

Credits: 1-6
Geographical study of particular region or relevant regional issue.

Prerequisites
30 credits.

Notes
Content varies. May be repeated to a maximum of 12 credits.

Hours of Lecture or Seminar per week
1-6
Hours of Lab or Studio per week
0

GEOG 357 - Structures in Urban Governance and Planning
Credits: 3
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.

Prerequisites
30 credits.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

GEOG 380 - Geography of Virginia

Credits: 3
Natural and cultural forces of Virginia. Studies regional makeup and analysis of human and environmental characteristics.

Prerequisites
30 credits.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

GEOG 399 - Selected Topics in Geography

Credits: 3
Content varies; determined by instructor.

Prerequisites
30 credits.

Notes
May be repeated up to a maximum of 12 credits.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
0

GEOG 406 - Suburban Geography

Credits: 3
Analyzes spatial aspect of social, economic, and political activities in suburbia. Suburbanization viewed as independent force and
component of larger urbanization process.

**Prerequisites**
60 credits.

**Notes**
Uses Northern Virginia as lab for suburban geographical study and student-initiated field work projects.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**GEOG 411 - Advanced Digital Cartography**

Credits: 3
Design and production of full-color digital maps and information graphics, map cognition and use, and principles of desktop mapping.

**Prerequisites**
Grade of C or better in GEOG 310.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**GEOG 412 - Aerial Photography Interpretation**

Credits: 3
Methods and techniques of interpreting and using information contained in aerial photography, including applications to various aspects of physical and cultural landscape.

**Prerequisites**
60 credits and GEOG 102 or 103, or permission of instructor.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**GEOG 415 - Seminar in Geography**

Credits: 3
Students produce, present original research papers.

**Prerequisites**
GEOG 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

GEOG 416 - Satellite Image Analysis

Credits: 3
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.

Prerequisites
60 credits and GEOG 412, or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

GEOG 420 - Physiography of North America

Credits: 1-3
Physiographic features of North American continent; spatial distribution; and influence on cultural, demographic, and economic development of United States and Canada.

Prerequisites
60 credits, GEOG 102, 3 additional credits of geography or geology, or permission of instructor.

Hours of Lecture or Seminar per week
0

Hours of Lab or Studio per week
0

GEOG 463 - Applied Geographic Information Systems

Credits: 3
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.

Prerequisites
2.00 or better in GEOG 300 and 311.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**GEOG 480 - Internship in Geography**

Credits: 1-3
Approved study programs with specific employers.

**Prerequisites**
Open only to majors with 90 credits and GPA of 2.50 in geography course work.

**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**
0

**Hours of Lab or Studio per week**
0

**GEOG 490 - Practicum in Geographical Applications**

Credits: 1-6
Application of geographical research tools and techniques in conjunction with faculty instruction and research. Individualized sections taught by arrangement with full-time faculty.

**Prerequisites**
Open only to authorized majors with 90 credits.

**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**
0

**GEOG 499 - Independent Study in Geography**

Credits: 1-3
Individual study of selected area of geography.

**Prerequisites**
Open only to geography majors with 90 credits, and permission of department and instructor.

**Notes**
Requires directed research paper. May be repeated to a maximum of 6 credits with permission of the department.

**GEOG 503 - Problems in Environmental Management**

Credits: 3  
Case studies of effects of human activities on atmospheric, hydrologic, geomorphic, and biotic processes.

**Prerequisites**  
6 credits of geography, including GEOG 102.

**Hours of Lecture or Seminar per week**  
3

**Hours of Lab or Studio per week**  
0

**GEOG 505 - Transportation Geography**

Credits: 3  
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.

**Prerequisites**  
6 credits of geography.

**Hours of Lecture or Seminar per week**  
3

**Hours of Lab or Studio per week**  
0

**GEOG 520 - Geography for Teachers**

Credits: 3  
Emphasizes problems and techniques in teaching geography, and current developments in research, methodology, and philosophy in the discipline.

**Prerequisites**  
Graduate standing, or permission of department.

**Hours of Lecture or Seminar per week**
GEOG 525 - Economics of Human/Environment Interactions

Credits: 3
Cross-Listed with ECON 895/EVPP 525

Advanced topics in environmental, natural resource, and ecological economics for noneconomist. Emphasizes sustainability, intergenerational equity, and economic-ecological feedbacks. Lecture, discussion with substantial student participation. Includes problem sets, class presentations, and term paper.

Prerequisites
EVPP 524/GEOG 524 or equivalent

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

GEOG 531 - Land-Use Modeling Techniques and Applications

Credits: 3
Cross-Listed with CSS 643/EVPP 531

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.

Prerequisites
GEOG 550, or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

GEOG 533 - Issues in Regional Geography

Credits: 1-6
Geographical study of particular region or relevant regional issue.

Notes
Content varies. May be repeated to a total of 12 credits with permission of the department.
GEOG 540 - Medical Geography

Credits: 3
Spatial approaches to study of health and disease. Topics include disease ecology and diffusion, and geographic perspectives on improving health care delivery.

Prerequisites
Course in statistics.

GEOG 550 - Geospatial Science Fundamentals

Credits: 3
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.

Notes
Only available for students without previous course work in cartography.

GEOG 551 - Thematic Cartography

Credits: 3
Analyzes nature of perceptual organization and visual systems in thematic map communication portrayal, graphic handling, and data analysis.

Prerequisites
GEOG 310 or 550.


GEOG 553 - Geographic Information Systems

Credits: 3
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.

Prerequisites
GEOG 550, or course in cartography.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

GEOG 554 - History of Cartography

Credits: 3
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.

Prerequisites
Graduate standing.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

GEOG 556 - Automated Cartographic Generalization

Credits: 3
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.

Prerequisites
GEOG 550, or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

GEOG 562 - Photogrammetry
Treatment of photogrammetric problems, including least squares adjustments, image coordination refinements, colinearity equation, resection, relative orientation, and analytic aerotriangulation.

**Prerequisites**
GEOG 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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**GEOG 563 - Advanced Geographic Information Systems**

Credits: 3
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.

**Prerequisites**
GEOG 553 or equivalent.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

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**GEOG 570 - The Hydrosphere**

Credits: 3
Cross-Listed with EOS 656/EVPP 652

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.

**Prerequisites**
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

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**GEOG 575 - Reconstructing Past Environments: Seminar in Geoarchaeology**

Credits: 3
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.

**Prerequisites**
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

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**GEOG 579 - Remote Sensing**

Credits: 3
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.

**Prerequisites**
GEOG 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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**GEOG 580 - Digital Remote Sensing**

Credits: 3
Examines theory and techniques of using digital remotely sensed data for obtaining geographic information of Earth's surface, including image-enhancement methods and classification strategies for variety of physical and cultural features.

**Prerequisites**
GEOG 416 or 579.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

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**GEOG 581 - World Food and Population**

Credits: 3
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.
Prerequisites
Graduate standing.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

GEOG 585 - Quantitative Methods

Credits: 3
Survey of quantitative methods commonly used in geographic research. Emphasizes spatial analysis techniques.

Prerequisites
Previous course work in statistics, or GEOG 310 or 550.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

GEOG 590 - Selected Topics in Geography and Cartography

Credits: 3
Analyzes topics of immediate interest.

Prerequisites
Permission of department.

Notes
Content varies. May be repeated to a maximum of 12 credits.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

GEOG 603 - Geographic Perspectives of Complex Natural Resource Management Topics

Credits: 3
Develops better understanding of strengths, limitations of restoring large and complex natural resource systems by examining critical aspects of one such effort.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0
GEOG 605 - Socioeconomic Applications of GIS

Credits: 3
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.

Prerequisites
GEOG 553.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

GEOG 631 - Spatial Agent-based Models of Human-Environment Interactions

Credits: 3
Cross-Listed with CSI 709/CSS 645/ EVPP 631

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.

Prerequisites
GEOG 531 or CSS 600, or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

GEOG 644 - Fundamentals and Interpretation of Imaging Radar

Credits: 3
Provides understanding of components, functionality, and use of radar remote sensing for acquiring spatial information. Concentrates on operational systems. Includes hands-on assignments.

Prerequisites
GEOG 579 or EOS 753, or other basic course in remote sensing.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0
GEOG 650 - Introduction to GIS Programming

Credits: 3
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.

Prerequisites
GEOG 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

GEOG 653 - Geographic Information Analysis

Credits: 3
Explores existing and potential capabilities of geographic information systems in conducting spatial analysis and modeling.

Prerequisites
GEOG 553 and 585.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

GEOG 655 - Map Design

Credits: 3
Advanced examination of principles of map design, including discussions of map design research.

Prerequisites
GEOG 310 or 550.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

GEOG 656 - Terrain Mapping
Credits: 3
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.

**Prerequisites**
GEOG 553 or equivalent, or permission of instructor.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**GEOG 661 - Map Projections and Coordinate Systems**

Credits: 3
Covers development of various map projections and coordinate systems, property analysis, distortions, and applications.

**Prerequisites**
GEOG 310 or 550.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**GEOG 664 - Spatial Data Structures**

Credits: 3
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.

**Prerequisites**
GEOG 310 or 550.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**GEOG 670 - Applied Climatology**

Credits: 3
Applies climatic concepts to natural and human-modified environments, and analyzes climatic change.

**Prerequisites**
Course in weather and climate, or permission of instructor.
GEOG 671 - The Lithosphere

Credits: 3
Cross-Listed with EOS 657/GEOL 601

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.

Prerequisites
Graduate standing.

GEOG 674 - Environmental Impact Analysis

Credits: 3
Scientific and administrative processes involved in environmental impact analysis and environmental impact statements.

GEOG 680 - Seminar in Thought and Methodology

Credits: 3
Includes historical development of geographic thought and current philosophy of geography; rationale for various subfields; and geographic research techniques and methods of analysis.

Prerequisites
GEOG 585.
GEOG 690 - Advanced Practicum in Geographical Applications

Credits: 1-6
Applies spatial technologies in conjunction with faculty instruction and research. Individualized sections taught by arrangement with full-time faculty.

Prerequisites
Permission of department.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
0

GEOG 695 - Internship

Credits: 1-6
Approved study programs with specific employers. Students and employer supervisors must demonstrate relevancy of study program to degree requirements.

Prerequisites
Permission of department.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
0

GEOG 698 - Directed Readings and Research

Credits: 1-3
Reading and research on specific topic under direction of faculty member.

Prerequisites
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
0
Hours of Lab or Studio per week
0

GEOG 750 - Advanced Geographical Research Applications
Credits: 1-6
Advanced research employing geographical tools and research techniques.

Prerequisites
Permission of instructor.

Notes
Content varies. May be repeated to a maximum of 12 credits with permission of the department.

GEOG 785 - Geographic Field Work

Credits: 3
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.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

GEOG 791 - Colloquium in Earth Systems Science

Credits: 1
Cross-Listed with EOS 900/EVPP 791

Introduces in colloquium format various parts of Earth systems. Invited talks by Mason faculty and primarily Earth science experts in Washington, D.C. area. 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

GEOG 792 - Seminar in Earth Systems Science

Credits: 2
Cross-Listed with EOS 792/EVPP 792

Capstone experience. Seminars presented by faculty and students.

Prerequisites
15 graduate credits and courses on atmosphere, hydrosphere and lithosphere.

Notes
For graduate students with background in Earth's major systems. Topics vary from semester to semester.

Hours of Lecture or Seminar per week
2

Hours of Lab or Studio per week
0

GEOG 795 - Seminar in Regional Analysis

Credits: 3
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.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

GEOG 799 - Thesis

Credits: 1-6
Prerequisites
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
0

Hours of Lab or Studio per week
0

Grading
S/NC

GEOL 101 - Introductory Geology I

Credits: 4
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.

Notes
May include field trips.
GEOL 102 - Introductory Geology II

Credits: 4
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.

Prerequisites
GEOL 101

Notes
May include field trips.

GEOL 206 - Topics in Geology I

Credits: 1-3
Discusses particular topic in geology.

Notes
May include field trips.

GEOL 302 - Mineralogy

Credits: 4
Crystallographic, optical, chemical, and physical properties of minerals.

Prerequisites
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  
Basic techniques for collecting, recording, and plotting spatial field data including use of topographic maps, compasses, transit, alidade, and global positioning systems (GPS).

**Prerequisites**  
30 credits including MATH 105 or equivalent, and GEOG 102 or GEOL 101.

**Notes**  
Includes field work.

**GEOL 304 - Sedimentary Geology**

Credits: 4  
Introduces sedimentation, sedimentary petrology, facies analysis, and stratigraphy.

**Prerequisites**  
GEOL 101 and 102, and grade of C or better in GEOL 302.

**Notes**  
May include field trips.

**GEOL 305 - Environmental Geology**

Credits: 3  
Investigates geological principles directly relating to environmental problems, geological causes and effects of natural disasters, geology of natural resources, geology of land-use planning, and geology as related to health problems.

**Prerequisites**  
GEOL 101, and either GEOL 102, GEOL 309/BIOL 309, or GEOG 309.

**Notes**
May include field trips.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

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**GEOL 306 - Soil Science**

Credits: 3  
Composition, classification, physical properties, and origin of soils.

**Prerequisites**
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

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**GEOL 308 - Igneous and Metamorphic Petrology**

Credits: 4  
Genesis, classification, and recognition of igneous and metamorphic rocks.

**Prerequisites**
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

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**GEOL 309 - Introduction to Oceanography**

Credits: 3  
Introduces physical, chemical, biological, and geological aspects of oceanic environment.

**Prerequisites**
GEOL 101 and BIOL 103 or 213.
GEOL 312 - Invertebrate Paleontology

Credits: 4
Classification, evolutionary trends, and distribution of common invertebrate fossils.

Prerequisites
GEOL 101, 102; or BIOL 103, 104; or BIOL 213, 303, 304.

Notes
May include field trips.

GEOL 313 - Hydrogeology

Credits: 3
Geological and hydrologic factors controlling occurrence, distribution, movement, quality, and development of groundwater.

Prerequisites
GEOL 101 or GEOG 102, MATH 113, and CHEM 211.

GEOL 315 - Topics in Geology II

Credits: 1-3
Discusses particular topic in geology.

Prerequisites
CHEM 211, 212; MATH 113 or permission of instructor.

Notes
May include field trips.
**GEOL 316 - Computers in Geology**

Credits: 3  
Uses of mainframe and microcomputers, with emphasis on geologic applications.

**Prerequisites**  
GEOL 101, 102, and 302, and one semester of mathematics; or permission of instructor.

**GEOL 317 - Geomorphology**

Credits: 4  
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.

**Prerequisites**  
GEOL 101 and 102, with grade of C or better; or 6 credits in GEOG, including GEOG 102; GEOG 412 strongly recommended.

**Notes**  
May include field trips.

**GEOL 363 - Coastal Morphology and Processes**

Credits: 4  
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.

**Prerequisites**  
GEOL 309 or BIOL 309 or GEOL 317 with a grade C or better; or 9 credits in geography, including GEOG 309.
3
Hours of Lab or Studio per week
3

GEOL 401 - Structural Geology

Credits: 4
Igneous, sedimentary, and metamorphic rocks in folded, faulted, and metamorphosed terrains.

Prerequisites
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
Geological history of North America in terms of plate tectonics. Geological development and history of North America's major regions.

Prerequisites
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
Includes stable isotope, crystal, water, and organic geochemistry; geochronology; and geochemistry of rocks.

Prerequisites
GEOL 101 and 102

Hours of Lecture or Seminar per week
GEOL 404 - Geological Field Techniques

Credits: 3-8
Mapping techniques involved in collecting geological field data.

Prerequisites
GEOL 101, 102, 302, 304, 308, and 401.

Notes
Includes field work.

GEOL 405 - Geology of Mineral and Energy Resources

Credits: 3
Topics include metallic and nonmetallic ore deposits, fossil fuels, alternate energy resources, and methods by which each is used.

Prerequisites
GEOL 101, 102, 302, 304, 308, and 401.

Notes
May include field trips.

GEOL 406 - Seminar in Earth and Environmental Science

Credits: 3
Students read, discuss research literature; produce, present original papers.

Prerequisites
90 credits.

Notes
Capstone seminar for Earth and environmental science majors.
GEOL 408 - Practicum for Geology Laboratories

Credits: 1
Studies techniques to make geology lab effective component in geological education. Discusses developing testing materials, supplemented by experience operating geology course lab section.

Prerequisites
Geology major with 80 credits, and permission of department chair.

GEOL 409 - Practicum for Geology Laboratories

Credits: 1
Studies techniques to make geology lab effective component in geological education. Discusses developing testing materials, supplemented by experience operating geology course lab section.

Prerequisites
Geology major with 80 credits, and permission of department chair.

GEOL 410 - Research Proposal Preparation

Credits: 1
Prepares students for research in GEOL 411. Includes literature research, initial data collection, and preparing research proposal.

Prerequisites
Geology or Earth science major with 80 credits, and permission of department chair.
GEOL 411 - Geological Research

Credits: 3
Geological research: data collection and reduction, interpretation, preparation of written report, and oral presentation of results.

Prerequisites
GEOL 410.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
3

GEOL 417 - Geophysics

Credits: 3
Basic principles of geophysics including gravity, magnetism, and seismic reflection and refraction.

Prerequisites
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
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.

Prerequisites
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, GEOG 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 480 - Internship

Credits: 1-3
Approved study programs with specific employers.

Prerequisites
Open only to majors with 90 credits.

Notes
Contact department one semester before enrollment.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
0

GEOL 500 - Selected Topics in Modern Geology

Credits: 1-3
Topic designated in class schedule.

Prerequisites
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
Topic designated in class schedule. Lecture, lab, field trip.

Prerequisites
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
In-service course to strengthen and update knowledge of Earth science.

Prerequisites
Employment or anticipated employment as 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 601 - The Lithosphere

Credits: 3
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.

Prerequisites
Graduate standing.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

GEOL 613 - Environmental Geochemistry and Mineralogy

Credits: 3
Explores hot topics and aids students in developing intellectual skills to identify key research problems. Students will also improve their writing and presentation skills.

Prerequisites
Graduate standing.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

GEOL 800 - Studies for the Doctor of Philosophy in Education

Credits: variable
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.
**Prerequisites**
Admission to PhD in education program to study geology.

**Notes**
Enrollment may be repeated.

**GERM 101 - Elementary German I**

Credits: 3  
Designed for students with no knowledge of German. Introduces elements of grammar, vocabulary, oral skills, listening comprehension, and reading.

**Notes**
Lab work required. 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**
1

**GERM 102 - Elementary German II**

Credits: 3  
Continuation of GERM 101.

**Prerequisites**
GERM 101, or permission of department.

**Notes**
Lab work required. 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**
1

**GERM 105 - Review of Elementary German**

Credits: 3  
Reviews elements for students who have studied German previously.

**Prerequisites**
Appropriate placement score, or permission of department.

**Notes**
Lab work required. Students may not receive credit for GERM 105 and GERM 101, 102, or 110.
**GERM 110 - Elementary German**

Credits: 6  
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.

**GERM 201 - Intermediate German I**

Credits: 3  
Further development of skills in listening, speaking, reading, and writing.

**Prerequisites**  
GERM 102 and 105, appropriate placement score, or permission of department.

**Notes**  
GERM 201 and 202 must be taken in sequence. Lab work required. Students may not receive credit for GERM 201 and GERM 210.

**GERM 202 - Intermediate German II**

Credits: 3  
Applies skills to reading, composition, and discussion.

**Prerequisites**  
GERM 201, appropriate placement score, or permission of department.

**Notes**  
Lab work required. Students may not receive credit for GERM 202 and GERM 210.
**GERM 210 - Intermediate German**

Credits: 3
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.

**Prerequisites**
GERM 110 or appropriate placement score.

**Notes**
Lab work required. Students may not receive credit for GERM 210 and GERM 201 or 202.

**GERM 250 - Gateway to Advanced German**

Credits: 3
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.

**Prerequisites**
GERM 210, appropriate placement score, or permission of department.

**Notes**
Taught in German

**GERM 301 - Culture and Civilization**

Credits: 3
Covers development of German civilization from 18th century to present. Includes German cultural contributions to world civilization.

**Prerequisites**
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
Develops fluency in speaking, and proficiency in writing German through discussion, reports, and compositions based on texts dealing with contemporary events and issues.

Prerequisites
GERM 250, appropriate placement score, or permission of instructor.

Notes
Not for native speakers.

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
Introduces terminology and structural features of business German. Emphasizes acquiring vocabulary and developing facility in reading German business articles and correspondence.

Prerequisites
GERM 250, appropriate placement score, or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

**GERM 318 - Translation of Texts**

Credits: 3
Introduces principles and techniques of translation. Translation of texts from the natural and social sciences, current events, and contemporary culture.

Prerequisites
GERM 250 or equivalent; appropriate placement score; or permission of instructor.

**Notes**
Translations mainly from German into English.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**GERM 325 - Major Writers**

Credits: 3
Works of major German, Austrian, and Swiss writers in translation.

**Prerequisites**
ENGL 101 or equivalent, or permission of instructor.

**Notes**
Writers to be studied vary. Course work 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

**GERM 340 - Survey of German Literature**

Credits: 3
Overview of history of German literature to 1880.

**Prerequisites**
GERM 250, appropriate placement score or permission of instructor.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**GERM 355 - Readings in Poetry**

Credits: 3
Intensive reading of German poetry in its historical context. Studies genre characteristics and development.

**Prerequisites**
GERM 250, appropriate placement score or permission of instructor.
Notes
Types of poetry studied vary. May be repeated for credit when subject is different, with permission of department.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

GERM 365 - Readings in Narrative Prose

Credits: 3
Intensive reading of German narrative prose, such as autobiographical fiction, fairy tales, and film. Studies genre characteristics and development.

Prerequisites
GERM 250, appropriate placement score or permission of instructor.

Notes
Topics vary. May be repeated for credit when subject is different, with permission of department.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

GERM 375 - Readings in Drama

Credits: 3
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.

Prerequisites
GERM 250, appropriate placement score, or permission of instructor.

Notes
May be repeated for credit with permission of department when subtitle differs.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

GERM 415 - Advanced Grammar and Style

Credits: 3
Studies syntax, idiomatic features, and levels of style. Extensive practice in different types of written expression.
Prerequisites
15 credits of German or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

GERM 418 - Advanced Composition
Credits: 3
Develops proficiency in writing German through intensive practice in preparing guided and original compositions.

Prerequisites
15 credits of German, or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

GERM 442 - The Age of Goethe
Credits: 3
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.

Prerequisites
15 credits of German, or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

GERM 444 - The Literature of Romanticism
Credits: 3
German Romantic poetry and prose. Background and some theory included.

Prerequisites
15 credits of German, or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0
GERM 450 - Modern Literature: 1880-1925

Credits: 3
Literature of Naturalism, Impressionism, and Expressionism, in Germany, Austria, and Switzerland.

Prerequisites
15 credits of German, or permission of instructor.

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
Literary trends since 1925 in Germany, Austria, and Switzerland.

Prerequisites
15 credits of German, or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

GERM 480 - Special Topics

Credits: 3
Special topics on language, literature, or culture by theme, approach, or era.

Prerequisites
15 credits of German, or permission of instructor.

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

GLOA 101 - Introduction to Global Affairs
Credits: 3
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.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**GLOA 490 - Independent Study in Global Affairs**

Credits: 1-3
Reading or research on specific topic related to globalization, under direction of faculty member.

**Prerequisites**
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 credit up to total 6 credits.

**Hours of Lecture or Seminar per week**
1-3

**Hours of Lab or Studio per week**
1-3

**GLOA 495 - Global Experiential Learning**

Credits: 1-18
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.

**Hours of Lecture or Seminar per week**
0

**Hours of Lab or Studio per week**
0

**GLOA 600 - Global Competencies**

Credits: 3
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
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
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 710 - Seminar Abroad**

Credits: 3
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.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0
GLOA 720 - Capstone Research Seminar

Credits: 3
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.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

GOVT 101 - Democratic Theory and Practice

Credits: 3
Comparative exploration; topics include contemporary analysis of the meanings of liberty, equality, representation, property rights, voting rights, and civil responsibilities.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

GOVT 103 - Introduction to American Government

Credits: 3
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.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

GOVT 132 - Introduction to International Politics

Credits: 3
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.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0
GOVT 133 - Introduction to Comparative Politics

Credits: 3
 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.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

GOVT 300 - Research Methods and Analysis

Credits: 4
 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.

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
 American judicial organization and operation, role of the Supreme Court in policy formation, and selected constitutional principles.

Prerequisites
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
Prerequisites
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

Credits: 3
Legal, administrative, fiscal, and political dimensions of evolving American federalism.

Prerequisites
GOVT 103.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

GOVT 307 - Legislative Behavior

Credits: 3
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.

Prerequisites
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
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.

Prerequisites
GOVT 103
GOVT 309 - Government and Politics of Metropolitan Areas

Credits: 3
Government, politics, and problems of metropolitan centers and surrounding areas.

Prerequisites
GOVT 103.

GOVT 311 - Public Opinion and Electoral Behavior

Credits: 3
Studies actions of voters, candidates, and political parties in relation to the expression of relevant public opinion in a democratic system.

Prerequisites
GOVT 103 and 300.

GOVT 312 - Political Parties and Campaigns

Credits: 3
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.

Prerequisites
GOVT 103.
**GOVT 318 - Interest Groups, Lobbying, and the Political Process**

Credits: 3
Role, internal operations, strategies, and activities of interest groups. Evaluates ability of these groups to influence or control government and enhance democratic process. Considers conditions under which social movements become, or fail to become, effective interest groups.

**Prerequisites**
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
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.

**Prerequisites**
GOVT 103.

**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

**GOVT 322 - International Relations Theory**

Credits: 3
Advanced inquiry into international relations. Studies theories, concepts of international relations, and major forces and issues in international politics.

**Prerequisites**
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
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.

Prerequisites
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
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.

Prerequisites
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
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.

Prerequisites
GOVT 101, or 3 credits of philosophy.

Notes
May be repeated for credit when subject matter 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
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.

Prerequisites
GOVT 101 or 133.

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
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.

Notes
May be repeated for credit when topic is different, with permission of department, but no more than 9 credits of GOVT 329 are permitted.

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
Contemporary political systems of Latin America, with emphasis on institutions, political processes, and political behavior. Presents case studies of several key Latin American polities; discusses problems of political development.

Prerequisites
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
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.

Prerequisites
GOVT 132, 133.

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
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.

Prerequisites
GOVT 132, 133.

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
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.

Prerequisites
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
Process of political development and change in context of modernization and industrialization. Examines patterns of political development, with emphasis on developing world.
Prerequisites
GOVT 132, 133.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

GOVT 337 - Ethnic Politics in Western Europe and North America

Credits: 3
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.

Prerequisites
GOVT 132, 133.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

GOVT 338 - Government and Politics of Russia

Credits: 3
Examines continuity and change in Russia's Soviet era and post-Soviet era politics and international relations.

Prerequisites
GOVT 132, 133.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

GOVT 339 - Issues in the Politics of Advanced Industrial Societies

Credits: 1-3
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.

Prerequisites
GOVT 103 or 133, or permission of instructor.

Hours of Lecture or Seminar per week
3
GOVT 340 - Central Asian Politics

Credits: 3
Comparative examination of political change in Central Asia with attention to national identity formation, political economy, political conflict, political Islam, and democratization.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

GOVT 341 - Chinese Foreign Policy

Credits: 3
Discusses 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.

Prerequisites
GOVT 132, 133.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

GOVT 342 - Diplomacy

Credits: 3

Prerequisites
GOVT 132, 133.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

GOVT 343 - International Political Economy
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.

**Prerequisites**
GOVT 132, 133; or permission of instructor.

**GOVT 344 - American Foreign Policy**

Credits: 3
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.

**Prerequisites**
GOVT 132, 133.

**GOVT 345 - Political Islam**

Credits: 3
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.

**GOVT 346 - American Security Policy**

Credits: 3
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.

**Prerequisites/Corequisites**
Prerequisites or corequisites: GOVT 132, 133.
**GOVT 347 - International Security**

Credits: 3  
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.

**Prerequisites**  
GOVT 132.

**GOVT 349 - Issues in the Analysis of Global Systems**

Credits: 1-3  
Overview of global systems with emphasis on political subsystem and interactions with other global systems.

**GOVT 351 - Administration in the Political System**

Credits: 3  
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.

**Prerequisites**  
GOVT 103.
GOVT 355 - Public Personnel Administration

Credits: 3
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.

Prerequisites
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
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.

Prerequisites
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
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.

Prerequisites
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
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.

Prerequisites
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
Applies computers and computer-based analytical techniques to management information needs in public sector. Focuses on mainframe and microcomputer applications.

Prerequisites
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
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.

Prerequisites
30 credits

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

GOVT 364 - Public Policy Making

Credits: 3
Processes, agencies, and politics involved in the proposal making, implementation, evaluation, and revision of U.S. public policy.
Prerequisites
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
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.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

GOVT 366 - Public Policy Analysis

Credits: 3
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.

Prerequisites
GOVT 300.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

GOVT 399 - Research Practicum in Public and International Affairs

Credits: 1-3
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.

Prerequisites
GOVT 300, and permission of instructor

Hours of Lecture or Seminar per week
1-3
Hours of Lab or Studio per week
0
GOVT 400 - Political Research and Data Analysis

Credits: 3
Methods of research and data analysis used in research about politics. Examines ways to design research to answer questions, select appropriate techniques for data collections, and use statistics to organize and interpret data. Students also learn to carry out data analysis using microcomputers and programs such as SPSS to process data and compute statistics.

Prerequisites
GOVT 300.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

GOVT 407 - Law and Society

Credits: 3
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.

Prerequisites
ADJ 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
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.

Prerequisites
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
Responsibilities and freedoms of mass media in democracy. Explores Influence of media on citizens' opinions, elections, and decisions of public officials.

**Prerequisites**
GOVT 103.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

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**GOVT 414 - Politics of Race and Gender**

Credits: 3
Examines political, economic, and social impact of public policies and implications for race, gender, and age.

**Prerequisites**
GOVT 103.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

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**GOVT 420 - American Political Thought**

Credits: 3
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.

**Prerequisites**
GOVT 103

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

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**GOVT 421 - Contemporary Political Ideologies**

Credits: 3
Studies political ideologies that shape values, beliefs, and actions of contemporary regimes and political movements. Topics include liberalism, conservatism, socialism, communism, and fascism in theory and contemporary practice; and totalitarianism
and nationalism in postindustrial and developing societies.

**GOVT 422 - Constitutional Interpretation**

Credits: 3
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.

**Prerequisites**
GOVT 103.

**GOVT 423 - Constitutional Law: Civil Rights and Liberties**

Credits: 3
Studies First Amendment freedoms of speech, press, assembly, association, and religion; right to privacy; and Fourteenth Amendment equal protection.

**Prerequisites**
GOVT 103.

**GOVT 424 - Constitutional Law: Criminal Process and Rights**

Credits: 3
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.

**Prerequisites**
GOVT 103.
GOVT 427 - Feminist Political Thought

Credits: 3
Explores feminist political thought in historical context. Topics include feminist political movements, feminist critiques of political philosophy, and feminist contributions to political theory.

Prerequisites
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
Cross-Listed with PHIL 428

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.

Prerequisites
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
Comparative political leadership, relationships between political cultures and types of leadership, patterns of leadership recruitment, and linkages between political elites and citizenry.

Prerequisites
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
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.

Prerequisites
GOVT 132, 133.

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
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.

Prerequisites
GOVT 133 and 60 credits, or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

GOVT 434 - Democracy in Global Perspective

Credits: 3
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.

Prerequisites
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
Explores sources of morality in armed conflict, and implications of such ideas for international relations. Examines content and philosophy of modern law of war.

Prerequisites
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
Major issues in international system, including international political economy and security.

Prerequisites
GOVT 132, 133.

Notes
May be repeated for credit when topic is different, with permission of department, but no more than 9 credits of GOVT 444 permitted.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

GOVT 445 - Human Rights

Credits: 3
Explores philosophical, legal, and political issues at heart of modern international human rights movement. Examines historical background legal architecture of modern human rights movement.

Prerequisites
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  
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.

Prerequisites  
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  
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.

Prerequisites  
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  
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.

Prerequisites  
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  
Law of public office. Studies procedures followed by and the legal limits on administrative agencies and their officers and employees.
Prerequisites
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
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.

Prerequisites
ADJ 100.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

GOVT 464 - Issues in Public Policy and Administration

Credits: 1-3
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.

Prerequisites
GOVT 103 plus 60 credits.

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

GOVT 470 - Faith and Reason in the Making of the Modern Mind

Credits: 3
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
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
Examines the evolving relationship between religion and the American political order, from the Reformation to George W. Bush.

GOVT 480 - Internship

Credits: 3-6
Students develop individual contracts defining learning and competencies they plan to gain from the experience.

Notes
Contact department one semester before enrolling. Approved work-study programs with specific employers.

GOVT 490 - Synthesis Seminar
Credits: 3
Readings, individual or group projects, and discussion of papers reflecting on connections between liberal arts and sciences and political world.

**Prerequisites**
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

**GOVT 491 - Honors Seminar**

Credits: 3
Readings, individual or group projects, and discussions of seminar papers.

**Prerequisites**
Completion or concurrent enrollment in all other required general education courses, GOVT 300, and 18 credits in major.

**Notes**
Subject varies.

**Hours of Lecture or Seminar per week**
3

**GOVT 496 - Directed Readings and Research**

Credits: 1-3
Reading and research on specific topic under direction of faculty member.

**Notes**
Open to majors in public and international affairs with 90 credits, and permission of instructor and department. Written report required; oral report of research may be required.

**Hours of Lecture or Seminar per week**
0

**GOVT 500 - Research Methods in Political Science**
Introduces research methods and data sources to study political science and practice of government. Topics include measurement of political concepts, research design, archival research techniques, survey research and case study development, and data analysis with elementary statistics.

**GOVT 510 - American Government and Politics**

Credits: 3
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 520 - Political Theory**

Credits: 3
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.

**GOVT 530 - Comparative Politics**

Credits: 3
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  
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.

**Hours of Lecture or Seminar per week**  
3  
**Hours of Lab or Studio per week**  
0

**GOVT 541 - Introduction to Critical Analysis and Strategic Response to Terrorism**

Credits: 3  
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  
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.

**Prerequisites**  
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**
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.

**GOVT 604 - Seminar on Congress and Legislative Behavior**

Credits: 3
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.

**Prerequisites**
GOVT 510.

**GOVT 605 - Seminar on the Presidency**

Credits: 3
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.

**Prerequisites**
GOVT 510.

**GOVT 631 - Seminar in Comparative Politics and Institutions**

Credits: 3
Examines theories and practices of governance, development, and conflict resolution in comparative national settings. Covers elections in presidential and parliamentary democracies, institutional forms, political cultures, and ideologies. Comparative analysis theories and research reflecting alternative analytic perspectives applied to institutions and political processes of nations, regions.
GOVT 640 - Strategic Responses to Terrorism: Coordinated Decision Making

Credits: 3
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.

Notes
This is the capstone course for the terrorism certificate program and must be completed in the final semester of the certificate program.

GOVT 641 - Seminar in Global Systems

Credits: 3
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.

Prerequisites
Completion of all core courses.

GOVT 706 - Federalism and Intergovernmental Relations

Credits: 3
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.

Prerequisites
GOVT 510.
GOVT 711 - Problem Solving and Data Analysis I

Credits: 3
Techniques and research skills to solve policy-related problems or analyze politics-related data. Focuses on problem definition, research design, and problem solving under conditions of uncertainty in politics and public sector.

Prerequisites
GOVT 550 and passing grade on screening exam

GOVT 712 - Problem Solving and Data Analysis II

Credits: 3
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.

Prerequisites
GOVT 711.

GOVT 713 - The Constitution, Criminal Procedure, and Security

Credits: 3
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.

Prerequisites
JLCP 720/GOVT 728, or permission of instructor.
GOVT 715 - Advanced Seminar in Political Methodology

Credits: 3
Common statistical techniques employed in political science research including OLS regression, logistic regression, probit, factor analysis, multidimensional scaling, discriminant analysis, cluster analysis, and analysis of variance. Sampling and inferential statistics.

Prerequisites
GOVT 500.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

GOVT 717 - Advanced Seminar in Qualitative Methods

Credits: 3
Examines the use of different research methods used in political science including case studies, interviews, content analysis, and participant observation. Analysis of the appropriateness of these techniques for different research questions. Discussion of procedural and ethical concerns that might arise in use of these methods.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

GOVT 719 - Issues in American Politics

Credits: 3
Examines significant issue in American politics and political behavior. Analyzes topic of contemporary and emerging concern.

Prerequisites
GOVT 510.

Notes
Course may be repeated when topics are different.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

GOVT 725 - Democratic Theory and Democratization
Credits: 3
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.

Prerequisites
GOVT 520.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

GOVT 726 - Theories of Justice

Credits: 3
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
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.

Prerequisites
JLCP 700, 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
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.
GOVT 731 - Advanced Seminar in Comparative Politics

Credits: 3
Assumes basic proficiency in comparative analysis. Addresses theoretical and methodological issues central to comparative politics by focusing on specific topic such as international development, race and ethnicity, and social movements; or region such as Latin America, Asia, Middle East, European Union, Africa, and Russia. Focuses on advanced modes of inquiry through in-depth analysis and discussion.

Prerequisites
GOVT 530

Notes
May be repeated for credit when topic is different and with permission of department.

GOVT 732 - Comparative Justice

Credits: 3
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.

Prerequisites
JLCP 700/ GOVT 726, or permission of instructor.

GOVT 739 - Issues in Comparative and International Politics

Credits: 3
Explores issues of contemporary and emerging concern in comparative and international politics.

Prerequisites
GOVT 540.
**GOVT 741 - Advanced Seminar in International Politics**

Credits: 3
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.

**Prerequisites**
GOVT 540.

**Notes**
May be repeated for credit when topic is different and with permission of department.

**GOVT 743 - International Political Economy**

Credits: 3
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.

**Prerequisites**
GOVT 343 or equivalent.

**GOVT 745 - International Security**

Credits: 3
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.

**Prerequisites**
GOVT 540.
GOVT 753 - Third-Party Governance

Credits: 3
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.

GOVT 755 - Seminar in Politics and Bureaucracy

Credits: 3
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.

Prerequisites
GOVT 510.

GOVT 758 - Homeland/Transportation Security Administration

Credits: 3
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.
GOVT 759 - Issues in Public Administration and Management

Credits: 3
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 once 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
Contact internship coordinator one semester before enrollment. Work-study program with specific employers.

Prerequisites
12 credits in MAIS political science concentration.

Notes
Open only to students admitted to MAIS-political science concentration. Credit determined by department.

Hours of Lecture or Seminar per week
0

Hours of Lab or Studio per week
0

GOVT 795 - Leadership in Justice and Security Organizations

Credits: 3
Examines leadership theories and explores fundamental questions about leadership in justice and security organizations today.

Prerequisites
JLCP 740/PUAD 790, or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

GOVT 796 - Directed Readings and Research
Credits: 1-3
Reading and research on specific topic under direction of faculty member.

**Prerequisites**
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**
0

**Hours of Lab or Studio per week**
0

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**GOVT 798 - Political Science Research Project**

Credits: 3
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.

**Prerequisites**
24 credits.

**Hours of Lecture or Seminar per week**
0

**Hours of Lab or Studio per week**
0

**Grading**
S/NC

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**GOVT 799 - Political Science Thesis**

Credits: 1-6
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.

**Prerequisites**
24 credits, and approval of thesis proposal.

**Hours of Lecture or Seminar per week**
0

**Hours of Lab or Studio per week**
0

**Grading**
S/NC
GOVT 810 - American Political Development

Credits: 3
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.

Prerequisites
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
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.

Prerequisites
GOVT 510.

Notes
May be repeated for up to 9 credits on different topics.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

GOVT 815 - Advanced Seminar in Political Behavior

Credits: 3
Advanced graduate-level seminar on specific topics of contemporary research and theory in American political behavior. Topic varies to include political parties, electoral politics, public opinion and voting behavior, interest groups, and lobbying. Readings include classic and contemporary literature. Seminar format with discussion, student presentations.

Prerequisites
GOVT 510.

Notes
May be repeated for up to 9 credits on different topics.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0
GOVT 820 - Advanced Topics in Political Thought

Credits: 3
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.

Prerequisites
GOVT 520.

Notes
May be repeated for up to 9 credits on different topics.

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
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.

Prerequisites
GOVT 540.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

GOVT 833 - European Union and Political Integration

Credits: 3
Advanced graduate-level seminar on European integration and theories of international organizations. Examines evolution of European Union and other international organizations, such as NATO, which have brought most European states together since end of World War II.

Prerequisites
GOVT 540 and 631.

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
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.

Prerequisites
GOVT 540.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

GOVT 843 - Diplomacy

Credits: 3
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.

Prerequisites
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
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.

Prerequisites
GOVT 510.

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  
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  
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.

Prerequisites  
GOVT 510.

Hours of Lecture or Seminar per week  
3

Hours of Lab or Studio per week  
0

GOVT 853 - Advanced Seminar in Global Innovations in Public Finance

Credits: 3  
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.

Hours of Lecture or Seminar per week  
3

Hours of Lab or Studio per week  
0

GOVT 854 - Advanced Seminar in Comparative Public Administrative Systems

Credits: 3  
Specific topics of contemporary research and theory in comparative public administration, including the international diffusion of governmental reform and innovation, public administration in developing countries, and international trends in public administration theory. Includes readings in classic and contemporary literature.

Hours of Lecture or Seminar per week  
3
GOVT 998 - Doctoral Dissertation Proposal

Credits: 1-6
Work on research proposal that forms basis for doctoral dissertation.

Prerequisites
Advancement to candidacy.

GOVT 999 - Doctoral Dissertation Research

Credits: 1-12
Research on approved dissertation topic under direction of dissertation committee.

Prerequisites
Approval of dissertation proposal.

Notes
May be repeated for up to 9 credits in a semester, but no more than 15 total.

GREE 150 - Classical Greek I

Credits: 3
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.
GREE 160 - Classical Greek II

Credits: 3
Expands proficiency, refines grasp of morphology and syntax, and fosters greater command of vocabulary. Introduces selected original passages from Greek classical authors.

Prerequisites
GREE 150 or permission of instructor.

Notes
Lectures, discussions supplemented by web-posted material.

GSOM 520 - Foundations of Marketing

Credits: 3
Introduces the marketing concept of an organization. Provides analytical techniques currently used by marketers in a wide variety of institutional and competitive situations. Emphasis is on the use of technology to aid in analysis, decision making, and communication of decisions to relevant publics. The course focuses on emphasizing the role of a marketer in developing and managing long-term customer relationships.

Prerequisites
Graduate admission or permission of instructor.

GSOM 530 - Foundations of Operations Management

Credits: 3
The course introduces and examines the principles, techniques, and methodologies required to successfully manage the operations of an organization in today’s dynamic environment. The course will address both strategic and tactical issues of operations management and evaluate their impact on an organization’s competitiveness, productivity, flexibility, quality, and cost. The course uses case studies of real-world situations for analytical problem solving, quantitative modeling, and the analysis.

Prerequisites
Graduate admission or permission of instructor.
GSOM 531 - Managing Business Systems Development

Credits: 3
The course introduces principles and practices in development of information systems in a modern organization. Emphasis is on developing the managerial understanding and skills necessary in development and implementation of information systems. Students will learn and apply the methodologies of systems analysis and design and gain an understanding of managerial issues related to the software development lifecycle (SDLC).

Prerequisites
Graduate admission or permission of instructor.

Hours of Lecture or Seminar per week
3

GSOM 540 - Analysis of Financial Decisions

Credits: 3
This course provides a survey of financial decision-making. It will develop a framework within which students can understand the linkages between financial decisions and organizational performance. To accomplish this, the course will examine methods for using information based on financial statements in making decisions and assessing performance, evaluating investment opportunities, and choosing among alternative sources of funds. While the course will focus on public firms in the corporate sector, some attention will be directed toward applications for privately-held companies and organizations in the government and non-for-profit sectors.

Prerequisites
Graduate admission or permission of instructor.

Hours of Lecture or Seminar per week
3

GSOM 550 - Change Management

Credits: 3
This course explores how to implement change in today’s business environment and considers the 4 generations in the workplace. Change models are introduced and applied. Students are introduced to individual and organizational change concepts and strategies for dealing with resistance and conflict.

Prerequisites/Corequisites
Graduate admission or permission of the instructor.

Hours of Lecture or Seminar per week
3

GSOM 551 - Leadership
This course 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. Integrates theory, research, and applications. Students apply principles of leadership and motivation to their own work situations and case evaluation.

**Prerequisites**
Graduate admission or permission of instructor.

**Hours of Lecture or Seminar per week**
3

**GSOM 570 - Spatial Technology Applications in Business and Management**

Credits: 3
Introduces graduate students to the application of GIS technology to business studies and management, emphasizing the concepts and theories of spatial analysis and information systems applied to business and management. Hands-on exercises to familiarize students with business solutions using GIS and spatial technology.

**Prerequisites**
Graduate admission or permission of instructor.

**Hours of Lecture or Seminar per week**
3

**GSOM 571 - Advanced Spatial Information Systems: Applications in Business and Management**

Credits: 3
Introduces students to enhanced application of GIS, Spatial Information Technology, Business Intelligence (BI) programs to business and management issues. Explores existing and potential capabilities of technology in conducting spatial business analysis, simulations, spatial modeling and visualization. Discusses advanced GIS and BI concepts as strategic decision-making business tools that support marketing research and analysis, logistics, management science, operations and information systems, international business and strategic business decision-making. Focuses on designing, planning, and completing a hands-on capstone project using GIS and Spatial Technology to reveal concepts and demonstrate the power of integration analysis and visualization to enhance business decision-making within a particular company of choice.

**Prerequisites**
GSOM 570 or permission of instructor.

**Hours of Lecture or Seminar per week**
3

**GSOM 610 - Methods and Uses of Financial Accounting**
Credits: 3
This course focuses on the practical methods and uses of financial accounting for business transactions. Topics include an introduction to the basic financial reporting model, analysis of transactions and their treatment for accounting reports, and financial statement analysis.

**Prerequisites**
Graduate admission or permission of the instructor.

**Hours of Lecture or Seminar per week**
3

**GSOM 630 - Systems Thinking and Business Dynamics**

Credits: 3
In a business world that is increasingly interconnected, interactions intensify and proliferate managers are continually asked to assess events and make decisions that impact business performance. 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 business performance in a variety of situations spanning different industries.

**Prerequisites**
Graduate admission or permission of instructor.

**Hours of Lecture or Seminar per week**
3

**GSOM 631 - Business Applications of Data Mining**

Credits: 3
This course introduces sophisticated analytical techniques for identifying patterns from large amounts of data. Focus is on data analysis approach and methods to help businesses successfully uncover hidden patterns and associations from large amounts of data. The emphasis is on understanding the different decision models and application of the results to improve business decision making in different business domains.

**Prerequisites**
Graduate admission or permission of instructor.

**Hours of Lecture or Seminar per week**
3

**GSOM 640 - Finance for Managers**

Credits: 3

**Prerequisites**
Graduate admission or permission of the instructor.

**Hours of Lecture or Seminar per week**
3

**GSOM 660 - Economics for Managers**

Credits: 3  
Provides a fundamental understanding of how microeconomics concepts are usefully applied to managerial decision making. Principles of microeconomic theory are explored fully, including market supply and demand, production and cost functions, industry structure, and product and resource pricing.

**Prerequisites**  
Graduate admission or permission of instructor.

**Hours of Lecture or Seminar per week**
3

**GSOM 746 - Real Estate Analysis and Valuation**

Credits: 3  
*Cross-Listed with MBA 746*

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.

**Prerequisites**  
Graduate admission or permission of instructor.

**Hours of Lecture or Seminar per week**
3

**GSOM 747 - Real Estate Finance**

Credits: 3  
*Cross-Listed with MBA 747*

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.

**Prerequisites**  
Graduate admission or permission of instructor.

**Hours of Lecture or Seminar per week**
3
GSOM 748 - Real Estate Investment

Credits: 3
Cross-Listed with MBA 748

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.

Prerequisites
Graduate admission or permission of instructor.

Hours of Lecture or Seminar per week
3

HAP 290 - Lifestyle Management through Systems Analysis

Credits: 3
Students make resolutions (e.g., maintain a healthy diet, exercise more, etc.) and analyze their lifestyle to see what is causing and preventing success. Each student maintains a diary and analyzes it using Bayesian causal modeling techniques to understand the constraints and causes leading to successes and failures. Students analyze their pattern of success using statistical process control tools and engage in cycles of self improvement.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

HAP 301 - Health Care Delivery in the United States

Credits: 3
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 Management and Philosophy

Credits: 3
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 334 - Role Development for Health Administration Majors**

Credits: 3  
Explores career opportunities that build on basic education in health science field. Includes historical perspectives on ethical, legal, political, social, and cultural issues related to health care policy and research. Explores multidisciplinary collaboration among health care providers.

**Hours of Lecture or Seminar per week**  
3

**Hours of Lab or Studio per week**  
0

**HAP 360 - Introduction to Health Information Systems**

Credits: 3  
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 395 - Health Care Finance**

Credits: 3  
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.

**Prerequisites**  
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
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.

Prerequisites
HAP 301

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

HAP 410 - Introduction to Health/Medical Practice Management

Credits: 3
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.

Prerequisites
HAP 301

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

HAP 416 - Leadership and Management of Health Systems I

Credits: 3
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.

Prerequisites
HAP 301. Completion of HAP 300-level course requirements.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0
HAP 417 - Leadership and Management of Health Systems II

Credits: 3
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.

Prerequisites
Completion of HAP 416.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

HAP 420 - Management of Project Resources

Credits: 3
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.

Prerequisites
HAP 360 and HAP 378

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

HAP 442 - Introduction to Health Care Politics and Policy

Credits: 3
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.

Prerequisites
HAP 301

Hours of Lecture or Seminar per week
3
HAP 445 - Introduction to Health Services Research

Credits: 3
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.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

HAP 447 - Regulatory Requirements for Health Care Systems

Credits: 3
Cross-Listed with HAP 547
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.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

HAP 460 - Information Technology Project Management

Credits: 3
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.

Prerequisites
HAP 360

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0
HAP 494 - Special Topics in Health Administration and Policy

Credits: 3
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
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.

Prerequisites
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: 1-3
Provides individual study of a particular problem area in health administration and policy research, theory development, or
education under the direction of faculty.

Prerequisites
Permission of college.

Notes
May be repeated for maximum 6 credits.

Hours of Lecture or Seminar per week
0
HAP 501 - Business Statistics in Health Service Management

Credits: 3
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.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

HAP 540 - Introduction to Emergency Preparedness/Disaster Recovery for Health Care Professionals

Credits: 3
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 542 - Health Policy

Credits: 3
Explores development of public health policy, influence of health care delivery, nursing, and other health professions.

Notes
Classroom and field experience required.

Hours of Lecture or Seminar per week
2
Hours of Lab or Studio per week
1

HAP 546 - Leadership Strategies in Health Policy
Credits: 3

**Cross-Listed with** NURS 546

Examines the leadership process from a policy and organizational perspective to expand students' ability to impact the health policy-making process.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**HAP 547 - Regulatory Requirements for Health Care Systems**

Credits: 3

**Cross-Listed with** HAP 447

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.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**HAP 586 - Quality Improvement in Health Services**

Credits: 3

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.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**HAP 594 - Special Topics in Health Care**

Credits: 3

**Cross-Listed with** GCH 594/NURS 594

Selected topics analyzing specialized areas in health care.

**Notes**
Content varies. Lecture, seminar, laboratory, and workshops.

**HAP 601 - E-Commerce and On-line Marketing for Health Services**

Credits: 3
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.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**HAP 609 - Comparative International Health Systems**

Credits: 3
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
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.

**Prerequisites**
Health care financial management or equivalent, or permission of instructor
HAP 611 - Computer Programming within Health Care Environment

Credits: 3
Focuses on use of M computing program and its incorporation into electronic health records. Includes scientific principles for easy-to-maintain software programs. Includes writing of special routings for Electronic Health Record (HER), preferably VISTA.

HAP 612 - Maintaining Business Continuity in Health Care

Credits: 3
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.

HAP 613 - Project Management in Health Information Technology

Credits: 3
Covers the body of knowledge in project management as applied to information technology and prepares students to take project management professional certification exam. Includes needs assessment, project planning, project cost analysis, project control, project risks, and management of personnel within projects.

HAP 621 - Management of Health Service Organizations
Credits: 3
Introductory course in application of organizational and management theory relating to management of health service organizations. Emphasizes leadership and trends in organizational structure that affect performance effectiveness, quality and interorganizational relations, and values and principles of health management as a profession. Explores challenges of managing health professionals' decision making, power gradients, change, and other issues that affect function and performance of health service organizations. Introduces strategies used by learning organizations.

Prerequisites
Admission to CHHS graduate program or permission of instructor.

| Hours of Lecture or Seminar per week | 3 |
| Hours of Lab or Studio per week       | 0 |

**HAP 642 - Health Policy Development and Analysis**

Credits: 3
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 Sciences Research**

Credits: 3
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.

Prerequisites
HAP 678 (if required in program of study) and HAP 501 or equivalent statistics course

| Hours of Lecture or Seminar per week | 3 |
| Hours of Lab or Studio per week       | 0 |

**HAP 650 - Assisted Living Management and Operations**
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

**HAP 660 - Health Policy Formation and Implementation**

Credits: 3
Applies selected methods for studying theory and practice of health policy formulation and converting a policy into administrative decisions and a plan of action. Emphasis on acquiring a basic working knowledge of health system and problem complexity and evaluation of policy impact using contemporary health policy examples and case studies. Identifies the institutional determinants of health policy formation and implementation, including special interest and stakeholder groups and their interaction.

**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
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 - Aging and Health Care Policy**

Credits: 3
Focuses on policy perspective in relation to older adults in community and long-term care facilities. Students analyze policy issues and health care delivery systems as they affect older adults through lecture, discussion, field trips, projects, and policy analysis papers.

**Prerequisites/Corequisites**
GCH 637, SOCI 599, or NURS 659; or permission of instructor
HAP 678 - Introduction to the U.S. Health System

Credits: 3
Explores structure, function, and financing of U.S. health care delivery systems. Explores development of various subsystems of care and ways public, private, and social forces influence politics of health care, shape the system, and affect public health. Includes analysis of systems infrastructure and sociopolitical context of U.S. health care system.

Prerequisites
To all other certificate courses for students who do not have familiarity with all aspects of U.S. health care system and recent working experience.

HAP 680 - Applied Public Health Leadership and Management

Credits: 3
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.

HAP 690 - Independent Study

Credits: 1-3
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 702 - Managerial Accounting in Health Care

Credits: 3
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.

Prerequisites
Graduate-level statistics or research methods course

HAP 703 - Financial Management in Health Systems

Credits: 3
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.

Prerequisites
Admittance to graduate program and working knowledge of health care industry.

HAP 704 - Contemporary Issues in Health Systems Management

Credits: 3
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.

HAP 702 - Managerial Accounting in Health Care

Credits: 3
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.

Prerequisites
Graduate-level statistics or research methods course

HAP 703 - Financial Management in Health Systems

Credits: 3
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.

Prerequisites
Admittance to graduate program and working knowledge of health care industry.

HAP 704 - Contemporary Issues in Health Systems Management

Credits: 3
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.

HAP 702 - Managerial Accounting in Health Care

Credits: 3
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.

Prerequisites
Graduate-level statistics or research methods course

HAP 703 - Financial Management in Health Systems

Credits: 3
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.

Prerequisites
Admittance to graduate program and working knowledge of health care industry.

HAP 704 - Contemporary Issues in Health Systems Management

Credits: 3
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.
HAP 705 - Strategic Management and Marketing in Health Care

Credits: 3
Develops executive skills for strategic decision making through use of marketing-based tools and techniques. Covers strategic planning, market research and opportunity and risk analysis, customer assessment, market segmentation, and life cycle assessment for health care services in managed care and non-managed care environments.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

HAP 706 - Integrated Health Systems Management

Credits: 3
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
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
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.
Prerequisites
HAP 501 or equivalent introductory graduate statistics course and lab.

Hours of Lecture or Seminar per week
2
Hours of Lab or Studio per week
1

HAP 711 - Hardware and Networking in Health Care Environment

Credits: 3
Focuses on the operating system, network of computers, and noncomputing hardware. Students learn to connect imaging and other equipment to electronic health records and provide electronic services online. Includes configuration of laboratory and imaging systems to VISTA electronic health record.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

HAP 712 - Topics in Public Policy

Credits: 3
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 714 - Ethical Issues in Health Administration and Policy

Credits: 3
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
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
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

Credits: 3
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.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

HAP 730 - Health Care Decision Analysis

Credits: 3
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.
Prerequisites
HSCI 501 or any statistics course.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

HAP 735 - Risk Analysis in Health and Bioscience

Credits: 3
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.

Prerequisites
HAP 730 or equivalent approved by instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

HAP 740 - Management of Health Information Systems

Credits: 3
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.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

HAP 745 - Health Care Security Policy

Credits: 3
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
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 755 - Analysis of Causality in Health Services Research

Credits: 3
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.

Prerequisites
A prior graduate-level course in statistics covering analysis of variance: HAP 501, GCH 601, GCH 804, or an equivalent course (approved by the instructor).

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
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.

Prerequisites
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
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
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
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
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).

Prerequisites
HAP 703 or equivalent, or permission of instructor.

Hours of Lecture or Seminar per week
HAP 780 - Data Mining in Health Care

Credits: 3
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.

Prerequisites
HAP 501 or equivalent introductory graduate statistics course and lab, or permission of instructor.

HAP 790 - Health Management Practicum and Capstone Seminar

Credits: 3
Team-based field practicum in health management, problem analysis, and project management in health care or service organization. Learning teams define complex problem in assigned facility and analyze problem with recommendations for management decision action. Analysis provides context in which theoretical concepts and management skills are applied. Uses case study analyses to explore problem-solving approaches in variety of situations and health care or service organizations.

Prerequisites
All course work in the major.

Notes
Practicum hours required in addition to class meetings. Permission of instructor required.

HAP 820 - Analytic Models in Health Services Management, Policy, and Research

Credits: 3
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.

Prerequisites
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
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.

Prerequisites
HAP 710 or equivalent graduate statistics course.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

HAP 822 - Research Designs and Analysis in Pharmaceutical and Health-Related Clinical Trials

Credits: 3
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.

Prerequisites
HAP 710 or equivalent graduate statistics course.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

HAP 866 - Politics of Influencing Health Care Policy

Credits: 3
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
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.

Prerequisites
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.

HEAL 110 - Personal Health

Credits: 3
Focuses on individual and family well-being through integrating fitness, nutrition, human sexuality, consumer health, drug education, and mental health.

HEAL 205 - Principles of Accident Causation and Prevention

Credits: 4
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.
HEAL 220 - Dimensions of Mental Health

Credits: 3
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
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.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

HEAL 310 - Drugs and Health

Credits: 3
Analyzes 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
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  
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  
Covers leadership and evaluation of health, fitness, and recreation programs. Uses computer technology to study evaluative aspects of program planning and administration.

**Prerequisites**
PRLS 310 or permission of instructor

**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  
Covers biological, behavioral, and sociocultural factors in human sexual behavior.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**HEAL 327 - Women's Health**

Credits: 3  
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
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
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
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

Credits: 3
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.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0
HEAL 402 - Introduction to Driver Education Instruction

Credits: 3
Introduces vehicle operator's tasks in highway transportation system. Provides essential knowledge and skills to instruct driver education.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

HEAL 403 - Driver Education Practice and Administration

Credits: 3
Applies driver education to simulated and actual driving environments. Provides essential knowledge and skills to administrate driver education.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

HEAL 405 - Teaching Methods in Health Education (K-12)

Credits: 3
Covers content, methodology, and resource materials in teaching health education for physical education teaching majors.

Prerequisites
BSED status or permission of instructor

Notes
Field experience required.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

HEAL 430 - Seminar in Exercise Science and Health Promotion

Credits: 3
Provides overview of contemporary and often controversial health issues with analysis of selected problems of current concern to society.
Prerequisites
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
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
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
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
Provides directed experience in observing and participating in health promotion and exercise science programs at community
agencies, health care centers, and private sector organizations.

**Prerequisites**
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**
0

**Hours of Lab or Studio per week**
12

**Grading**
PASS/FAIL

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**HEAL 499 - Independent Study in Health Education**

Credits: 1-3
Studies problem area in health education research, theory, or practice under faculty direction.

**Prerequisites**
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

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**HEAL 516 - Program Development and Resources in Health Education**

Credits: 3
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

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**HEBR 101 - Elementary Hebrew I**
HEBR 101 - Elementary Hebrew I

Credits: 3
Designed for students with no knowledge of Hebrew. Introduction including grammar, vocabulary, oral skills, listening comprehension, and reading. Lab work required.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
1

HEBR 102 - Elementary Hebrew II

Credits: 3
Continuation of HEBR 101.

Prerequisites
HEBR 101 or equivalent.

Notes
Lab work required.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
1

HEBR 150 - Introduction to Biblical Hebrew

Credits: 3
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
0
Hours of Lab or Studio per week
0

HEBR 160 - Readings in Biblical Hebrew

Credits: 3
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.

Prerequisites
HEBR 150 or equivalent.

Hours of Lecture or Seminar per week
3
HEBR 201 - Intermediate Hebrew I

Credits: 3
Further development of skills acquired in HEBR 101 and 102, including grammar, oral expression, listening comprehension, reading, and writing.

Prerequisites
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
Continuation of HEBR 201.

Prerequisites
HEBR 201 or equivalent.

Notes
Lab work required.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
1

HHS 201 - Introduction to Careers in the Health Professions

Credits: 3
Acquaints students early in their college education with a variety of health professions careers. Introduces basic medical terminology, provides overview of the health care system, and 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.

Hours of Lecture or Seminar per week
3
HHS 270 - Applied Human Anatomy and Physiology I

Credits: 3  
Fast-paced, condensed course covering basics of human anatomy and principles of physiology.

Prerequisites  
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.

HHS 271 - Applied Human Anatomy and Physiology II

Credits: 3  
Fast-paced, condensed course covering basics of human anatomy and principles of physiology.

Prerequisites  
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.

HHS 275 - Overview of Microbiology

Credits: 3  
Fast-paced, condensed lecture course covering basics of microbiology. Examines morphology, genetics, physiology, ecology, and control of microorganisms.

Prerequisites  
Permission of college.
Successful students must be capable of independent work and have many hours to devote to studying microbiology outside classroom.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**HHS 465 - Examination and Integration of Professional and Health Care Issues**

Credits: 3
Capstone seminar course synthesizing varied dimensions of a health professional's role in global society. Examines issues in health care through reflection on natural and behavioral sciences, humanities, and other prerequisite course work. Selected topics are examined through reading, writing, and discussion. Builds on knowledge and skills acquired through course work and field experience in the major and general education as well as through life experience. Application of literature in professional practice and related disciplines is expected in both formal and informal writings on issues. Student writings and presentations receive written self-evaluation as well as formal review by peers and multiple faculty members involved in teaching the course. Writing intensive.

**Prerequisites**
Completion of all general education requirements and English 302. For nursing students: Completion of all junior year nursing courses.

**Notes**
Required of all undergraduate students enrolled in community health, health systems management, and nursing majors. Meets requirement as synthesis course.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**HHS 597 - Approaches to Quantitative Data Analysis in Health Care Research**

Credits: 3
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 750 - Legal Issues Relevant to Health Care Administration**
Credits: 3
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.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

HHS 855 - Ethics in Health Care Administration

Credits: 3
Cross-Listed with NURS 855

Philosophical foundations of health care ethics. Students analyze specific ethical dilemmas faced by administrators in health care settings.

Prerequisites
Admission to PhD program; for non-PhD students, permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

HIST 100 - History of Western Civilization

Credits: 3
History of Western civilization from ancient Mediterranean origins through medieval and modern development of Europe to contemporary world.

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
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.
HIST 102 - Development of Western Civilization

Credits: 3
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.

HIST 120 - U.S. History

Credits: 3
Examines American society from its founding documents, values, institutions, and peoples to present. Requires experience in historical analysis.

Notes
Students cannot receive credit for HIST 120 if they have taken either HIST 121 or HIST 122.

HIST 121 - Formation of the American Republic

Credits: 3
Social, political, economic, and intellectual growth of American institutions from colonization through Reconstruction.

Notes
Students may not receive credit for HIST 121 if they have taken HIST 120.
HIST 122 - Development of Modern America

Credits: 3
History of the United States since 1877.

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

HIST 125 - Introduction to World History

Credits: 3
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.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

HIST 130 - History of the Modern Global System

Credits: 3
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.

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
Focuses on skills, methods of learning, and subject matter to introduce discipline of history.

Prerequisites
Freshman or sophomore standing.

Notes
Topics vary.

**HIST 201 - Freshman/Sophomore Seminar in European History**

Credits: 3
Focuses on skills, methods of learning, and subject matter to introduce discipline of history.

**Prerequisites**
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
Focuses on skills, methods of learning, and subject matter to introduce discipline of history.

**Prerequisites**
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
Surveys history of China and Japan from prehistoric times to ca. 1600.

**Hours of Lecture or Seminar per week**
3
HIST 252 - Survey of East Asian History

Credits: 3
Surveys history of China and Japan from early modern times (ca. 1600) to present.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

HIST 261 - Survey of African Civilization

Credits: 3

Surveys African history from earliest times to the decline of western Sudanic states in 16th century.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

HIST 262 - Survey of African Civilization

Credits: 3
Surveys African history from beginnings of interaction with Europe in 15th century to recent emergence of new states.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

HIST 271 - Survey of Latin American History

Credits: 3
Surveys colonial era to 1825. Emphasizes interactions of United States, Latin America.

Hours of Lecture or Seminar per week
3
HIST 272 - Survey of Latin American History

Credits: 3
Surveys development of independent Latin America since 1825. Emphasizes interactions of United States, Latin America.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

HIST 281 - Survey of Middle Eastern Civilization

Credits: 3
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)

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

HIST 282 - Survey of Middle Eastern Civilization

Credits: 3
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.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

HIST 298 - History and the Web

Credits: 1
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.
**HIST 299 - Databases for Historians**

Credits: 1
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.

**HIST 300 - Introduction to Historical Method**

Credits: 3
Introduces research skills and methods, as well as historical interpretation, culminating in written and oral presentations.

**Prerequisites**
ENGL 302; COMM 100, 101 or 104; 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.

**HIST 301 - Classical Greece**

Credits: 3
Political, social, economic, and cultural history of classical Greece from development of the city-state through 5th century.
HIST 302 - Classical Rome

Credits: 3
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
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
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
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
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
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
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.

Prerequisites
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
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
**HIST 314 - History of Germany**

Credits: 3  
Political, diplomatic, economic, social, and cultural development of Germany from dissolution of Holy Roman Empire to present.

**Hours of Lecture or Seminar per week**  
3  
**Hours of Lab or Studio per week**  
0

**HIST 321 - Early Modern England**

Credits: 3  
History of England from late 15th to mid-18th century, focusing on social, political, economic, and cultural changes of period with particular attention to English Reformation and causes and consequences of English Civil War.

**Hours of Lecture or Seminar per week**  
3  
**Hours of Lab or Studio per week**  
0

**HIST 322 - Modern Britain**

Credits: 3  
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.

**Hours of Lecture or Seminar per week**  
3  
**Hours of Lab or Studio per week**  
0

**HIST 328 - Rise of Russia**

Credits: 3  
Political, social, and cultural development of Russia from early times to the end of the 19th century.

**Hours of Lecture or Seminar per week**  
3
**HIST 329 - Modern Russia and the Soviet Union**

Credits: 3  
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.

**Hours of Lecture or Seminar per week**  
3

**Hours of Lab or Studio per week**  
0

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**HIST 330 - The United States Since World War II**

Credits: 3  
Examines major domestic and foreign policy factors that shaped American experience from World War II to present. Includes political, social, and economic forces as they affected nation's history.

**Hours of Lecture or Seminar per week**  
3

**Hours of Lab or Studio per week**  
0

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**HIST 331 - Postwar United States, 1945-1973**

Credits: 3  
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

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**HIST 332 - United States since 1976**

Credits: 3  
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.
HIST 335 - The African American Experience in the United States: African Background to 1885

Credits: 3
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.

Prerequisites
6 credits of history, or permission of instructor.

HIST 336 - The African American Experience in the United States: Reconstruction to the Present

Credits: 3
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.

Prerequisites
6 credits of history or permission of instructor.

HIST 337 - The Vietnam War

Credits: 3
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 the United States.
HIST 340 - History of American Racial Thought

Credits: 3
Introduces history of American racial thought, with particular emphasis on relationship between social theory and social practices of racism in American life. Examines origins.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

HIST 345 - History of American Foreign Relations

Credits: 3
Survey of American diplomacy from Revolutionary War to present, with emphasis on 20th-century issues.

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
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.

Prerequisites
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
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.
HIST 352 - The South since 1865

Credits: 3
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.

HIST 353 - History of Traditional China

Credits: 3
China from earliest times to period of modern Western intrusion. Development of traditional Chinese culture, society, and government.

**Prerequisites**
6 credits of history or permission of instructor.

HIST 354 - Modern China

Credits: 3
China from 1644 to the People's Republic of China. Emphasizes coming of West and various stages of Chinese reaction.

**Prerequisites**
6 credits of history or permission of instructor

HIST 355 - Women and Family in Chinese History
Explores women's experiences and changing meanings of womanhood over course of imperial and modern Chinese history. Focuses on issues of marriage, education, motherhood, women's work, property rights, legal status, sexuality, notions of love, foot binding and fashion, political participation, and women's liberation.

**Prerequisites**
45 credits or permission of instructor.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**HIST 356 - Modern Japan**

Credits: 3
Japan from Meiji Restoration to World War II. Emphasizes Japan's modernization in face of challenge.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**HIST 357 - Postwar Japan**

Credits: 3
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.

**Prerequisites**
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
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.

**Prerequisites**
HIST 364 - Revolution and Radical Politics in Latin America

Credits: 3
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.

Prerequisites
6 credits of history or permission of instructor.

HIST 365 - Conquest and Colonization in Latin America

Credits: 3
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.

Prerequisites
45 credits or permission of instructor.

HIST 366 - Comparative Slavery

Credits: 3
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.

Prerequisites
45 credits or permission of instructor.
HIST 367 - History, Fiction, and Film in Latin America

Credits: 3
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.

HIST 370 - War and American Society

Credits: 3
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
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
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.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**HIST 386 - Topics in History**

Credits: 3
Study of historical topics 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 387 - Topics in Global History**

Credits: 3
Study of historical topics or periods of special interest in global, Latin American, African, Asian, or Middle Eastern history.

**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 388 - Topics in European History**

Credits: 3
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
HIST 389 - Topics in U.S. History

Credits: 3
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
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.

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
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.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

HIST 392 - History of Virginia Since 1800

Credits: 3
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  
Study of historical periods or topics from perspective of feature films and documentaries.

**Notes**  
Topics available in advance in History Department. May be repeated when topic is different. Maximum 6 credits may be applied to history major.

| Hours of Lecture or Seminar per week | 3 |
| Hours of Lab or Studio per week       | 0 |

**HIST 398 - Historical Study Abroad**

Credits: 1-3  
Intended for participation in formally organized course offered by Center for Global Education during intersession or spring break.

**Notes**  
May be repeated for credit.

| Hours of Lecture or Seminar per week | 0 |
| Hours of Lab or Studio per week       | 0 |

**HIST 399 - Internship**

Credits: 1-9  
Approved work-study programs in cooperation with specific organizations including area museums; archives; historic sites; and local, state, and federal agencies.

**Prerequisites**  
History majors with permission of undergraduate coordinator.

**Notes**  
Credit determined by department.
**HIST 401 - Colonial America**

Credits: 3  
Intensive study of colonial American history from European origins through Revolutionary War.

**Hours of Lecture or Seminar per week**  
3  
**Hours of Lab or Studio per week**  
0

**HIST 403 - Revolutionary Era in American History, 1763-1812**

Credits: 3  
Study of formative years of new republic from Treaty of Paris of 1783 to election of 1820.

**Hours of Lecture or Seminar per week**  
3  
**Hours of Lab or Studio per week**  
0

**HIST 404 - Jacksonian America, 1812-1854**

Credits: 3  
Study of age of Andrew Jackson. Emphasizes democratic institutions that emerged as dominant influences in American society.

**Hours of Lecture or Seminar per week**  
3  
**Hours of Lab or Studio per week**  
0

**HIST 409 - Between the Wars: The United States, 1919-1941**

Credits: 3  
Intensive study of political, social, economic, and diplomatic developments in 1920s and 1930s.

**Hours of Lecture or Seminar per week**  
3  
**Hours of Lab or Studio per week**  
0
HIST 416 - U.S. Urban History

Credits: 3
Examination of the processes of urbanization in the United States, and the growth of American cities and suburbs from colonial times to the present.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

HIST 417 - History of Metropolitan Washington

Credits: 3
Examines urban and suburban growth in Washington, D.C., and its suburbs in Maryland and Virginia since 1790, in context of U.S. urban history.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

HIST 418 - Ethnic Groups in America

Credits: 3
Explores ethnicity and race in American urban society by comparing experiences of different ethnic groups as migrants to American cities.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

HIST 426 - The Russian Revolution

Credits: 3
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.

Prerequisites
45 credits or permission of instructor.

Hours of Lecture or Seminar per week
HIST 431 - Medieval Intellectual Topics

Credits: 3
Cross-Listed with ENGL 431/FREN 431

Selected topics in intellectual history of Middle Ages. Topics vary, depending on discipline of instructor.

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
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
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

**Cross-Listed with COMM 455**

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.

**Prerequisites**
3 credits in COMM or HIST courses.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**HIST 459 - Pre-Modern South Asia**

Credits: 3

History of South Asia (present-day India, Pakistan, and Bangladesh) from earliest civilizations along the Indus River to the advent of colonialism. Special attention is given to significant historical events, and their effect on the development of political, religious, and economic ideas.

**Prerequisites**
45 credits or permission of instructor.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**HIST 460 - Modern Iran**

Credits: 3

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.

**Prerequisites**
45 credits or permission of instructor.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**HIST 461 - Arab-Israeli Conflict**
Some knowledge of history of Middle East since World War I strongly advised. Overview of history of Arab-Israeli conflict. Examines conflict from various perspectives: conflict 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.

Prerequisites
45 credits or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

HIST 462 - Women in Islamic Society

Credits: 3
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.

Prerequisites
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

Credits: 3
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.

Prerequisites
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 466 - Origins of Conflict in Southern Africa

Credits: 3
Explores historical origins of conflict in South Africa, focusing on themes of economic change, cultural interaction, and political
consolidation during past five centuries.

**HIST 480 - Alexander the Great**

Credits: 3
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.

**HIST 490 - Honors Directed Readings, Honors Directed Research**

Credits: 3
Students must have completed at least one course in the field, or with the professor, chosen for these honors courses.

**Prerequisites**
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.

**HIST 491 - Honors Directed Readings, Honors Directed Research**

Credits: 3
Students must have completed at least one course in the field, or with the professor, chosen for these honors courses.

**Prerequisites**
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.
HIST 498 - Directed Readings/Research in History

Credits: 1-3
Readings, research conducted on individual basis in consultation with instructor.

Prerequisites
History majors with 90 credits and permission of instructor.

Notes
Student may not present more than 3 credits for graduation credit.

HIST 499 - Senior Seminar in History

Credits: 3
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.

Prerequisites
History majors with 90 credits, 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.

HIST 510 - Approaches to Modern World History

Credits: 3
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.

**HIST 523 - Issues in American History**

Credits: 3  
Reading, analysis of selected problems.

**Notes**  
Open to advanced undergraduates and graduates. Topic determined by instructor. Course may be repeated when content differs.

**Hours of Lecture or Seminar per week**  
3  
**Hours of Lab or Studio per week**  
0

**HIST 524 - Issues in European History**

Credits: 3  
Reading, analysis of selected problems.

**Notes**  
Open to advanced undergraduates and graduates. Topic determined by instructor. Course may be repeated when content differs.

**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  
Analysis of selected problems. Emphasizes reading and discussion of historical interpretations, and development of bibliography.

**Notes**  
Course may be repeated when content differs.

**Hours of Lecture or Seminar per week**  
3  
**Hours of Lab or Studio per week**  
0
HIST 535 - Problems in Comparative World History

Credits: 3
Investigates selected problems in global and comparative history, covering multiple countries or world regions.

Notes
Course may be repeated when content differs.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

HIST 555 - Problems in Asian History

Credits: 3
Discussion of readings and historical interpretations and compilation of a comprehensive bibliography on given theme.

Notes
Subjects announced by instructor. Course may be repeated when content differs.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

HIST 565 - Problems in African History

Credits: 3
Analysis of selected problems in African history. Emphasis on reading and discussion of historical interpretations and development of bibliography.

Notes
Course may be repeated when content differs.

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
Analyzes selected problem. Emphasizes reading and discussion of historical interpretations, and development of bibliography.

Notes
Course may be repeated when content differs.

**HIST 598 - Historical Study Abroad**

Credits: 1-3
Intended for participation in formally organized course offered by the Center for Global Education during intersession or spring break.

**Notes**
Not repeatable.

**HIST 601 - Themes in U.S. History I**

Credits: 3
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.

**Prerequisites**
Graduate standing.

**HIST 602 - Themes in U.S. History II**

Credits: 3
Continuation of HIST 601.

**Prerequisites**
Graduate standing.
HIST 605 - Themes in European History I

Credits: 3
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.

Prerequisites
Graduate standing.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

HIST 606 - Themes in European History II

Credits: 3
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.

Prerequisites
Graduate standing.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

HIST 610 - The Study and Writing of History

Credits: 3
Methodology of the historian including techniques of research, use of documentation and other sources, development of bibliography, and synthesis of material.

Prerequisites
Graduate standing.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0
HIST 613 - The Colonial Origins of American Society

Credits: 3
Study of evolution of elements in colonial society that affect contemporary American institutions and patterns of behavior.

Prerequisites
Graduate standing.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

HIST 615 - Problems in American History

Credits: 1-6
Readings and discussion of bibliographies, interpretations, and research trends in topics selected by instructor.

Prerequisites
Graduate standing.

Notes
Course may be repeated when content differs.

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
Investigates continuity and change in American West. Topics include economic development, ethnicity, rural and urban life, and role of federal government.

Prerequisites
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
Joint project of instructor and students into various aspects of common topic in Civil War era, with emphasis on historiography and historical method.

**Prerequisites**
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
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.

**Prerequisites**
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
Investigates evolution of civil liberties in American history, and interaction of three branches of government in applying various constitutional guarantees. Students read extensively in Supreme Court decisions and secondary literature, and undertake independent research.

**Prerequisites**
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
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.

**Prerequisites**
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
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.

**Prerequisites**
Graduate standing.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**HIST 622 - American Minds**

Credits: 3
Advanced introduction to major approaches to and themes in American intellectual history. Avoids positing American mind in beginning, instead exploring diversity of American thinkers. Focuses on several pivotal decades in American thought, and sees American thinkers in social contexts. Explores how nonelites have shaped American thought. Provides diverse and multifarious look at important American minds.

**Prerequisites**
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
Selected political, social, economic, diplomatic, and cultural forces that shaped the post-World War II American experience.

**Prerequisites**
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
Study of selected issues in American foreign relations and changing historical interpretations of American diplomacy.

Prerequisites
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
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.

Prerequisites
Graduate standing.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

HIST 627 - Urban Development of the United States

Credits: 3
Examines growth of U.S. cities, process of urbanization, and significance of cities in American history. Students become familiar with major issues and bibliography of American urban history.

Prerequisites
Graduate standing.

Hours of Lecture or Seminar per week
3
HIST 628 - Immigration and Ethnicity in the United States

Credits: 3
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.

Prerequisites
Graduate standing.

Notes
Conducted as readings colloquium.

HIST 629 - The Gilded Age and Progressive Era

Credits: 3
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.

Prerequisites
Graduate standing.

HIST 630 - U.S. Women's History

Credits: 3
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.

Prerequisites
Graduate standing.
Hours of Lab or Studio per week
0

HIST 631 - Era of the American Revolution

Credits: 3
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.

Prerequisites
Graduate standing.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

HIST 633 - Reconstruction

Credits: 3
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.

Prerequisites
Graduate standing.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

HIST 634 - Interwar America: 1918-1939

Credits: 3
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.

Prerequisites
Graduate standing.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0
HIST 635 - Problems in European History

Credits: 1-6
Investigates selected problems. Readings, discussions, development of bibliographies. Primary sources used where possible.

Prerequisites
Graduate standing.

Notes
Course may be repeated when content differs.

HIST 636 - Political Culture in Twentieth-Century Germany and Austria: Continuities and Discontinuities

Credits: 3
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.

Prerequisites
Graduate standing.

HIST 637 - Great Britain: Empire to Commonwealth, 1870-1970

Credits: 3
Examines rise of "new imperialism" in Great Britain from 1870 to end of empire, and gradual formation of Commonwealth of Nations.

Prerequisites
Graduate standing.

HIST 638 - Western Europe in the Post-War Period
Credits: 3
Examines process of reconstruction, reconciliation, and integration in Western Europe in 20 years after World War II.

Prerequisites
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
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.

Prerequisites
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
Studies individual cities, and investigates particular cities in depth. Considers economic, social, cultural, and political features of urban life.

Prerequisites
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
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.

**Prerequisites**
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
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.

**Prerequisites**
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
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.

**Prerequisites**
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
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.
Prerequisites
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
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 689 - Teaching and Learning History in the Digital Age

Credits: 3
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.

Prerequisites
Graduate standing.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

HIST 690 - The Administration of Archives and Manuscripts

Credits: 3
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.

Prerequisites
6 credits of U.S. history, or permission of department. Graduate standing.
HIST 691 - Museum Studies

Credits: 3
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.

Prerequisites
6 credits of U.S. history or permission of department. Graduate standing.

HIST 692 - Historical Editing

Credits: 3
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.

Prerequisites
Graduate standing.

HIST 693 - Historic Preservation

Credits: 3
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.

Prerequisites
6 credits of U.S. history or permission of department. Graduate standing.
HIST 695 - History Symposium

Credits: 3
Subject of academic and community interest pursued through discussions and lectures by distinguished guest instructors.

Prerequisites
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
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.

Prerequisites
Graduate standing.

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
Seminar; students create original historical projects in digital media.

Prerequisites
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 711 - Research Seminar in U.S. History
Credits: 3
Research in specialized topics using primary sources.

**Prerequisites**
HIST 610 or permission of department.

**Notes**
Maximum 6 credits may be earned.

**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
Research in specialized topics using primary sources.

**Prerequisites**
HIST 610 or permission of department.

**Notes**
Maximum 6 credits may be earned.

**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
Research seminar requiring comparative research and analysis. Organized around significant topic or theme in field of world history.

**Prerequisites**
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
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.

Hours of Lecture or Seminar per week
0

Hours of Lab or Studio per week
0

HIST 791 - Comprehensive Readings in Comparative World History

Credits: 3
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.

Hours of Lecture or Seminar per week
0

Hours of Lab or Studio per week
0

HIST 792 - Comprehensive Readings in European History Since 1500

Credits: 3
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.

Hours of Lecture or Seminar per week
0

Hours of Lab or Studio per week
0

HIST 794 - Internship in Applied History

Credits: 3-6
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.

**Prerequisites**
3 credits of applied history in appropriate area and 12 credits in major field, or permission of internship director.

**HOURS OF LECTURE OR SEMINAR PER WEEK**
0

**HOURS OF LAB OR STUDIO PER WEEK**
0

**HIST 796 - Directed Readings**

Credits: 1-6
Independent reading on topic agreed to by student and faculty member.

**Notes**
Maximum 6 credits may be earned.

**HOURS OF LECTURE OR SEMINAR PER WEEK**
0

**HOURS OF LAB OR STUDIO PER WEEK**
0

**HIST 798 - Directed Research and Writing in History**

Credits: 3
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.

**HOURS OF LECTURE OR SEMINAR PER WEEK**
0

**HOURS OF LAB OR STUDIO PER WEEK**
0

**HIST 799 - Thesis**

Credits: 1-6
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**
0

**HOURS OF LAB OR STUDIO PER WEEK**
0
Grading
S/NC

HIST 800 - Studies for the Doctor of Philosophy in Education

Credits: variable
Program of studies designed by discipline director and approved by doctoral committee, which brings student to participate in research of discipline director and results in paper reporting original contributions of student.

Prerequisites
Admission to PhD in education program to study history.

Notes
Enrollment may be repeated.

HIST 801 - New Developments in History

Credits: 3
Survey of current developments in historical analysis and methodology.

Prerequisites
Doctoral standing; or permission of instructor and HIST 610 or equivalent.

Hours of Lecture or Seminar per week
3

HIST 802 - Readings for Doctor of Arts in Community College Education

Credits: variable
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.

Prerequisites
Admission to doctor of arts in community college education program to study history.

Notes
May be repeated.

HIST 803 - Doctoral Readings for Major Field

Credits: 3
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.

**HIST 804 - Doctoral Readings for Minor Field**

Credits: 3
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.

**Prerequisites**
Doctoral standing.

**HIST 810 - History Doctoral Colloquium**

Credits: 1
Introduces array of scholars and scholarship through discussions of innovative historical events, important theories, and significant methodological breakthroughs in history.

**Prerequisites**
Doctoral standing.

**Notes**
May be taken for credit 6 times.

**HIST 811 - Doctoral Research Seminar**

Credits: 3
Students pursue research projects in their areas of specialization.

**Prerequisites**
Doctoral standing.
HIST 998 - Doctoral Dissertation Proposal

Credits: 1-6
Work on research proposal that forms basis for doctoral dissertation.

Prerequisites
Advancement to candidacy

Notes
May be taken for maximum 6 credits.

HIST 999 - Doctoral Dissertation Research

Credits: 1-12
Doctoral dissertation research and writing under direction of student's dissertation committee.

Prerequisites
Completion of HIST 998.

HNRS 110 - Research Methods

Credits: 4
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 these, write clearly, and address an audience of scholars.
HNRS 122 - Reading the Arts

Credits: 3
Explores relationship of parts to whole in work of art, connections among different art forms, and links between art and its historical context.

Prerequisites
HNRS 110

HNRS 125 - A Liberal Arts Approach to Calculus

Credits: 3
Assumes understanding of basic algebra and functions. Studies exponential models and develops mathematical concepts of limit and infinity including the topic of derivatives.

HNRS 130 - Conceptions of Self

Credits: 3
Drawing from appropriate works in social sciences, arts, and humanities, examines different conceptions and definitions of the self from diverse cultures and historical contexts.

Prerequisites
HNRS 110.

HNRS 131 - Contemporary Society in Multiple Perspectives
Explores methods and perspectives in social sciences and humanities to evaluate contribution of different disciplines to understanding significant social issues and their global ramifications and our responsibilities as citizens of the world.

**Prerequisites**
HNRS 110.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**HNRS 226 - Topics in Quantitative Analysis**

Credits: 3
Studies selected topics of special interest to honors students with suitable preparation.

**Notes**
For students who have taken calculus in high school. HNRS 226 is an alternative to HNRS 125.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**HNRS 227 - Scientific Thought and Processes I, II**

Credits: 4
Explores and integrates principles of classical and modern science through study of such topics as cosmology, evolution, ecology, mechanics, relativity, and quantum physics.

**Prerequisites**
HNRS 227 is prerequisite for HNRS 228.

**Notes**
Includes a weekly lab session.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
3

**HNRS 228 - Scientific Thought and Processes I, II**

Credits: 4
Explores and integrates principles of classical and modern science through study of such topics as cosmology, evolution, ecology, mechanics, relativity, and quantum physics.
Prerequisites
HNRS 227 is prerequisite for HNRS 228.

Notes
Includes a weekly lab session.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
3

HNRS 230 - Cross-Cultural Perspectives

Credits: 3
Enables students to broaden cultural horizons and understand human behavior by studying societies in depth and in comparison.

Prerequisites
HNRS 110.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

HNRS 240 - Reading the Past

Credits: 3
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.

Prerequisites
HNRS 110.

Notes
Provides context for HNRS 353.

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
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.
Prerequisites
Completion or concurrent enrollment in all other required HNRS courses.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

IETT 750 - Studies in Language and Culture I

Credits: 3
Offers opportunity to view how language shapes realities, including perceptions of children as learners. Explores cultural constraints and transformative possibilities embedded in language.

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
Building on IETT 750, students investigate more closely academic discourses and ways they frame lived realities. Exploring theme of how language and culture shape and open interpretations of the world, students research language and culture in their practice.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

IETT 752 - Research in Practice: The Team Project

Credits: 6
Concurrent with other courses, student teams refine research topics and develop projects to investigate those topics. Projects involve children as partners rather than subjects in research. Product is substantial piece of work submitted with plan for dissemination in school community.

Hours of Lecture or Seminar per week
6
Hours of Lab or Studio per week
0

IETT 753 - Teaching and Learning
Capstone course to help teachers document and reflect on individual growth and transformation while participating in IET school-based master's program. Through developing portfolio, teachers provide evidence to demonstrate professional growth and provide documentation about themselves as teachers and learners in the two years of the program. As part of documentation, teachers present team research projects in professional conference organized as third summer session.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**INFS 310 - Program Structure and Design for Business Applications**

Credits: 3

Cross-Listed with IT 308

Teaches structured programming and design using high-level language. Focuses on program design, coding, debugging, and documentation.

**Prerequisites**

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

Cross-Listed with IT 314

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.

**Prerequisites**

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

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.

**Prerequisites**

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

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.

**Prerequisites**

INFS 310 or CS 112.

**Hours of Lecture or Seminar per week**

3

**Hours of Lab or Studio per week**

0

**INFS 316 - Software Systems Engineering**

Credits: 3

Studies programming environments, including software tools and control of software development for large information systems engineering projects.

**Prerequisites**

INFS 310 or CS 211.

**Hours of Lecture or Seminar per week**

3

**Hours of Lab or Studio per week**

0

**INFS 414 - Advanced Database**

Credits: 3

**Cross-Listed with IT 414**

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.
Prerequisites
IT 314 or equivalent.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

INFS 462 - Information Security Principles

Credits: 3
Cross-Listed with IT 462

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.

Prerequisites
IT 212 or equivalent.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

INFS 498 - Independent Study in Information Systems Engineering

Credits: 1-3
Directed self-study of special topics of current interest in INFS.

Prerequisites
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
0
Hours of Lab or Studio per week
0

INFS 499 - Special Topics in Information Systems Engineering

Credits: 3
Topics of special interest to undergraduates.
**Prerequisites**
60 credits, and 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

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**INFS 501 - Discrete and Logical Structures for Information Systems**

Credits: 3
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.

**Prerequisites**
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

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**INFS 515 - Computer Organization**

Credits: 3
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.

**Prerequisites**
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
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.

Prerequisites
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.

INFS 524 - Database Management Essentials

Credits: 3
Relational database management systems. Covers logical and physical database design; query languages and database programming; and examines commercial systems.

Prerequisites
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.

INFS 565 - Database and Distributed System Security Principles

Credits: 3
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.

Prerequisites
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
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.

Prerequisites
INFS 501, 515, 519, and SWE 510, or equivalent

Notes
No substitutions can be made for this class.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

INFS 614 - Database Management

Credits: 3
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.

Prerequisites
INFS 501, 515, 519, and SWE 510, or equivalent.

Notes
Requires computing lab. No substitutions can be made for this class.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

INFS 622 - Information Systems Analysis and Design

Credits: 3
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.

Prerequisites
INFS 501, 515, and 519, or equivalent

Hours of Lecture or Seminar per week
3
INFS 623 - Classical and Web Information Retrieval

Credits: 3
Study of models and methods for storage and retrieval of unstructured information, such as documents. Topics include information retrieval models, automatic indexing, document clustering, statistical thesauri, search techniques, performance measurement, answer visualization, and search engines for retrieval from the web.

Prerequisites
INFS 501, 515, 519, and SWE 510.

INFS 640 - Introduction to Electronic Commerce

Credits: 3
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.

Prerequisites
INFS 501, 515, and 519; and SWE 510 or equivalent.

INFS 650 - Development Frameworks for Information Systems Applications

Credits: 3
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.

Prerequisites
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
Presents special topics in information systems not occurring in regular INFS sequence.

Prerequisites
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
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.

Prerequisites
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
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.

Prerequisites
INFS 650.
INFS 755 - Data Mining

Credits: 3

Prerequisites
STAT344 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
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.

Prerequisites
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
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.

Prerequisites
INFS 614 or CS 650, or permission of instructor.

Notes
Knowledge of object-oriented programming language such as C++ highly desirable.

Hours of Lecture or Seminar per week
INFS 770 - Knowledge Management for E-Business

Credits: 3
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.

Prerequisites
INFS 622 or permission of instructor.

INFS 772 - Intelligent Agents and the Semantic Web

Credits: 3
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.

Prerequisites
INFS 614

INFS 774 - Enterprise Architecture

Credits: 3
Cross-Listed with IT 874

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.
INFS 622 or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

INFS 780 - Data Mining in Multimedia Databases

Credits: 3
Cross-Listed with CS 780.

Covers advanced algorithms for data management, learning, and mining large, multimedia databases. Issues related to handling such data including feature selection, high dimensional indexing, interactive search and information retrieval, pattern discovery, and scalability to large datasets are discussed. Mining techniques and data types to be covered include texts/web, images, videos, DNA, temporal, spatial, spatiotemporal databases, graph mining, stream mining, and data visualization.

Prerequisites
INFS 755 or CS 750 or permission of instructor.

INFS 785 - Data Mining for Homeland Security

Credits: 3
Topics include small world graphs as way to model groups and organizations, relational data mining with emphasis in predictive models, alias discovery techniques, and profiling.

Prerequisites
INFS 755. Covers analytic techniques for investigative analysis.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

INFS 790 - Information Systems Policy and Administration

Credits: 3
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.

Prerequisites
Completion of all core courses.

Notes
Should be taken in final semester before graduation.
INFS 795 - Special Topics in Data Mining Applications

Credits: 3
Focuses on interdisciplinary applications of data mining. Topics selected from following: web and text data mining, e-commerce, bioinformatics, security and intelligence analysis, data mining of economical data. Each topic analyzed in depth; state-of-the-art techniques in application of data mining to field extensively covered.

Prerequisites
INFS 755.

INFS 796 - Directed Readings in Information Technology

Credits: 3
Research and analysis of contemporary problem in information system development.

Prerequisites
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.

INFS 797 - Advanced Topics in Information Systems

Credits: 3
Special advanced topics not occurring in regular INFS sequence.

Prerequisites
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
Research project chosen under guidance of full-time graduate faculty member, resulting in written technical report.

**Prerequisites**
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.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**INFS 799 - Thesis**

Credits: 1-6
Original or compilary work evaluated by a committee of three faculty members.

**Prerequisites**
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.

**Hours of Lecture or Seminar per week**
0

**Hours of Lab or Studio per week**
0

**ISA 522 - Information Security Essentials**

Credits: 3
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.

**Prerequisites**
An introductory information systems class or permission of instructor.

**Notes**
This course does not count for MS programs in the Computer Science Department.

**ISA 562 - Information Security Theory and Practice**

Credits: 3  
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.

**Prerequisites**
INFS 501, 515, 519, and SWE 510, or permission of instructor.

**ISA 563 - Fundamentals of Systems Programming**

Credits: 3  
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.

**Prerequisites**
An intermediate programming language course or permission of instructor.

**ISA 564 - Security Laboratory**
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.

**Prerequisites**
ISA 562 and ISA 563 or permission of instructor.

**ISA 640 - Programming Language Security**

Credits: 3
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.

**Prerequisites**
CS 540 and ISA 562 or permission of instructor.

**ISA 650 - Security Policy**

Credits: 3
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.

**Prerequisites**
ISA 562 or permission of instructor.

**ISA 652 - Security Audit and Compliance Testing**
Credits: 3
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.

Prerequisites
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
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.

Prerequisites
ISA 562 and CS 555 or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

ISA 673 - Operating Systems Security

Credits: 3
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 discussed. Recent advanced techniques, such as honeypots and honeyfarms, system randomization, vulnerability fingerprinting, and virtualization, will also be introduced.

Prerequisites
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
**ISA 674 - Intrusion Detection**

Credits: 3  
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.

**Prerequisites**  
ISA 562 and 650 or permission of instructor.

**Hours of Lecture or Seminar per week**  
3

**Hours of Lab or Studio per week**  
0

**ISA 681 - Secure Software Design**

Credits: 3  
Cross-Listed with SWE 781

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.

**Prerequisites**  
SWE 619 or permission of instructor.

**Hours of Lecture or Seminar per week**  
3

**Hours of Lab or Studio per week**  
0

**ISA 697 - Topics in Information Security**

Credits: 3  
Special topics in information security and assurance not occurring in regular ISA sequence.

**Prerequisites**  
Permission of instructor.

**Notes**  
May be repeated for credit when distinct offerings of course differ in subject.
ISA 763 - Security Protocol Analysis

Credits: 3
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.

Prerequisites
ISA 650 or permission of instructor.

ISA 764 - Security Experimentation

Credits: 3
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.

Prerequisites
ISA 562, ISA 564, ISA 674, or permission of instructor.

ISA 765 - Database and Distributed Systems Security

Credits: 3
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.
Prerequisites
INFS 614 and ISA 562, or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

ISA 767 - Secure Electronic Commerce

Credits: 3
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.

Prerequisites
ISA 562 and 656, or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

ISA 785 - Research in Digital Forensics

Credits: 3
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.

Prerequisites
ISA 562, CS 571 and CS 555 or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

ISA 796 - Directed Readings in Information Security

Credits: 3
Research and analysis of contemporary problem in information security.
Prerequisites
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

ISA 797 - Advanced Topics in Information Security

Credits: 3
Special advanced topics not occurring in regular ISA sequence.

Prerequisites
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
Research project chosen under guidance of full-time graduate faculty member, resulting in written technical report.

Prerequisites
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
ISA 799 - Thesis

Credits: 6
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.

Prerequisites
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.

IT 101 - Introduction to Information Technology

Credits: 3
Introduces fundamental concepts that provide technical underpinning for state-of-the-art applications. Presents perspective on range of information technology. Historical development and social implications of efforts in information technology integral to course.

IT 103 - Introduction to Computing

Credits: 3
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.

Prerequisites
Knowledge of high school algebra.
IT 108 - Programming Fundamentals

Credits: 3
Introduces programming fundamentals and presents software development process. Students learn to write programs in high-level, object-oriented language.

Prerequisites
IT 103.

IT 207 - Applied IT Programming

Credits: 3
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.

Prerequisites
IT 108 or CS 112, or permission of instructor.

IT 208 - Program Design and Data Structures

Credits: 3
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.

Prerequisites
IT 108, or permission of instructor.
IT 212 - Computer Hardware Fundamentals

Credits: 3
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 Computer Graphics

Credits: 3
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.

Prerequisites
IT 103 and 108

Hours of Lecture or Seminar per week
2

Hours of Lab or Studio per week
1

IT 214 - Database Fundamentals

Credits: 3
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.

Prerequisites
IT 103

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0
IT 223 - Information Security Fundamentals

Credits: 3
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

Prerequisites
IT 103 or equivalent.

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

IT 300 - Modern Telecommunications

Credits: 3
Comprehensive overview, including current status and future directions. Topics include review of evolution of telecommunications; voice and data services; basics of signaling, 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. Provides examples of real-life networks to illustrate basic concepts and gain further insight.

Prerequisites
IT 101 or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

IT 304 - IT in the Global Economy

Credits: 3
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.

Prerequisites
IT 103 or equivalent.

Notes
Students cannot receive credit for both IT 304 and CS 306.
**IT 308 - Event-Driven Programming**

Credits: 3  
**Cross-Listed with** INFS 310  

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.

**Prerequisites**  
IT 108 or CS 112 or permission of instructor.

**Hours of Lecture or Seminar per week**  
3  
**Hours of Lab or Studio per week**  
0

**IT 314 - Database Management**

Credits: 3  
**Cross-Listed with** INFS 311  

Studies logical and physical characteristics of data and their organization in computer processing. Emphasizes data as resource in computer applications, and examines database management system (DBMS) software and design, implementation, and use.

**Prerequisites**  
Computer programming course in high school or college.

**Hours of Lecture or Seminar per week**  
3  
**Hours of Lab or Studio per week**  
0

**IT 331 - Web I: Web Development**

Credits: 3  
Introduces the principles and techniques necessary for successful clientside 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.

**Prerequisites**
IT 103, 207, and 213; or permission of instructor.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**IT 332 - Web Site Administration**

Credits: 3
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.

**Prerequisites**
IT 331 and 341, or permission of instructor.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**IT 341 - Data Communications and Network Principles**

Credits: 3
This course 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.

**Prerequisites**
IT 101, 108, and 212, and MATH 108; or permission of instructor.

**Notes**
This course is 50 percent lab work of configuration of routers and network design, implementation, and testing.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**IT 342 - Operating Systems Fundamentals**
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.

**Prerequisites**
IT 101, 108, 212, and 341, or permission of instructor.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

### IT 343 - IT Resources Planning

Credits: 3
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.

**Prerequisites**
Junior standing in BS in information technology program, or permission of instructor.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

### IT 353 - Information Defense Technologies

Credits: 3
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.

**Prerequisites**
IT 101 (or equivalent), IT 103 (or equivalent), and IT 223.

**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
Cross-Listed with ADJ 304

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.

Prerequisites
IT 103 and 223.

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 362 - Introduction to Computer Statistical Packages

Credits: 3
Cross-Listed with STAT 362

Covers 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.

Prerequisites
IT 250/STAT 250 or equivalent

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

IT 366 - Network Security I

Credits: 3

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.

Prerequisites
IT 108 or equivalent, and IT 223

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0
**IT 413 - Digital Media Editing**

Credits: 3  
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.

**Prerequisites**  
IT 213

**Hours of Lecture or Seminar per week**  
3

**Hours of Lab or Studio per week**  
0

**IT 414 - Advanced Database**

Credits: 3  
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.

**Prerequisites**  
IT 314 or equivalent

**Hours of Lecture or Seminar per week**  
3

**Hours of Lab or Studio per week**  
0

**IT 415 - Information Visualization**

Credits: 3  
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.

**Prerequisites**  
IT 213

**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
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.

Prerequisites
IT 108 and 331, or permission of instructor.

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
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.

Prerequisites
IT 331 or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

IT 441 - Network Servers and Infrastructures

Credits: 3
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.

Prerequisites
IT 341, MATH 108 and either 112 or 125, and junior-level standing; or permission of instructor.

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
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.

Prerequisites
IT341.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

IT 455 - Wireless Communications and Networking

Credits: 3
This course covers the fundamental principles underlying wireless communications and networking. Topics include wireless transmission principles, protocols, satellite communications, cellular wireless networks, cordless systems, the wireless local loop, mobile IP, and wireless networking technologies, including IEEE 802.11 and Bluetooth standards.

Prerequisites
IT 300 and IT 341.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

IT 462 - Information Security Principles

Credits: 3
Cross-Listed with INFS 462

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.

Prerequisites
IT 212 or equivalent.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0
IT 466 - Network Security IT

Credits: 3
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.

Prerequisites
IT 108 or equivalent, IT 223, 341, 366; and MATH 112 or 125; or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

IT 471 - Applications of Digital Technologies

Credits: 3
Technologies and applications of digital components used in modern IT systems. Topics include microelectronics, including chip manufacturing and chip design, microprocessors on a chip, other digital components such as light emitting diodes (LED) and light sensor infrared technology, and potential possibilities and limitations of such devices. Application of microprocessors to current technologies includes examples such as modern communications, high-speed networks, fiber-optic technologies in communications and biotechnology, robotics, and high-tech manufacturing.

Prerequisites
IT 108 and 212, and high school algebra.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

IT 481 - Concepts of Multimedia Processing and Transmission

Credits: 3
Fundamentals of signal and image processing, including algorithms for signal processing that have applications to multimedia (voice and streaming video applications). Presents topics in voice coding and recognition, CD and DVD technology, streaming video, WANs and LANs, and videoconferencing technology.

Prerequisites
IT 108 and 213, or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0
IT 484 - Voice Communications Technologies

Credits: 3
Examines 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.

Prerequisites
IT 300 and IT 341.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

IT 488 - Fundamentals of Satellite Communications

Credits: 3
Offers appreciation for space environment and implications for space-based operations. Discusses engineering, scientific, political, and legal aspects of space for exploration and exploitation. Presents different uses of space communications and future trends.

Prerequisites
MATH 108, and IT 300 and 341; or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

IT 492 - Senior Design Project I

Credits: 3
First of two capstone courses. Students work in teams on project proposals that demonstrate preparedness as practicing IT professional. Students must prepare business plan, software and hardware requirements, schedule and organizational plan, documentation plan, quality control, and testing strategy. Environmental impact and social implications of project must be evaluated. Students must show they have researched relevant laws, treaties, and ethical implications. Oral and written reports evaluated during and at completion of proposal. Final presentation made before business panel. Individual sections of IT 492 focus on one of three different themes: business process, entrepreneurial, and network security. Students may choose any one theme for their capstone course. Descriptions of the themes and the respective sections in which they are offered are available from the
**Prerequisites**
Senior standing in BS information technology program, IT 343, 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

**IT 493 - Senior Design Project II**

Credits: 4
Second of two capstone courses. Students work in teams to complete projects that demonstrate preparedness as practicing IT professional. Includes ethical challenges. Status reports and engineering notebooks evaluated during project. Required readings include case studies. Teams, with contributions by each individual, present final written reports and final presentations before review panel comprising at least two business leaders. Individual sections of IT 493 focus on one of three different themes: business process, entrepreneurial, and network security. Students must register for the section that continues the IT 492 section of the same theme from the previous semester. Descriptions of the themes and the respective sessions in which they are offered are available from the department.

**Prerequisites**
Senior standing in BS in information technology program, and IT 492 taken previous semester.

**Hours of Lecture or Seminar per week**
4

**Hours of Lab or Studio per week**
0

**IT 495 - Turning Ideas into Successful Companies**

Credits: 3
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.

**Prerequisites**
Senior standing or permission of instructor.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0
IT 498 - Independent Study in Information Technology

Credits: 1-3
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
0
Hours of Lab or Studio per week
0

IT 499 - Special Topics in Information Technology

Credits: 1-3
Topics of special interest to undergraduates.

Prerequisites
Permission of instructor; 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
0
Hours of Lab or Studio per week
0

IT 500 - Quantitative Foundations for Information Systems Analysis

Credits: 3
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. Does not fulfill any VSITE graduate degree requirement.

Prerequisites
MATH 108 or equivalent.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

IT 658 - Networked Virtual Environments
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 that will be presented/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.

Prerequisites
CS 555

IT 665 - Managing Information Technology Programs in the Federal Sector

Credits: 3
This case study-grounded seminar introduces student team members to the unique complexities of the federal sector, including congressional and executive branch oversight and the reporting, justifying, and sustaining annually very large IT programs.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

IT 667 - Biometrics

Credits: 3
Cross-Listed with CS 667
Basic principles and methods for automatic authentication of individuals. Technologies include face, fingerprint, iris recognition, and speaker verification, among others. Additional topics cover multimodal biometrics, system design, performance evaluation, and privacy concerns. Term project required.

Prerequisites
CS 580 or permission of the instructor.

IT 685 - Capstone Seminar

Credits: 3
Faculty-facilitated, student teams analyze business cases from perspectives of IT, management and analysis, as well as leadership and ethics.

Hours of Lecture or Seminar per week
IT 688 - Pattern Recognition

Credits: 3
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.

Prerequisites
CS 580 or equivalent.

IT 735 - Topics in Stochastic Simulation

Credits: 3
Cross-Listed with OR 735/ SYST 735

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 ariate generation, variance reduction techniques, sensitivity analysis and optimization of simulation models, distributed and parallel simulation, object-oriented simulation, and specialized applications.

Prerequisites
OR 635 or permission of instructor.

Notes
May be repeated for credit when topics are distinctly different.

IT 746 - Calculus of Random Signals

Credits: 3
Cross-Listed with CSI 776
For graduate students in information technology, electrical engineering, mathematics, operations research, and statistics.
Introduction to modern theory of stochastic calculus such as stochastic integrals, martingales, counting processes, diffusion processes, and Itô-type processes in general. Presents applications of methods to engineering and biology. Focuses on developing necessary concepts rather than mathematical proofs.

**Prerequisites**
STAT 652 or CE 630 or 632.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**When Offered**
A, F

**IT 750 - Theory and Applications of Data Mining**

Credits: 3  
**Cross-Listed with** CS 750

Concepts and techniques in data mining and their 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.

**Prerequisites**
CS 681, 687, or 688; or permission of instructor.

**Notes**
Term project and topical review.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**IT 763 - Research Methods in Systems Engineering and Information Technology**

Credits: 3  
**Cross-Listed with** SYST 763/OR 763

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.

**Prerequisites**
STAT 554
IT 774 - Advanced Dynamic Programming

Credits: 3  
Cross-Listed with OR 774

This course covers advanced topics on the theory and practice of dynamic programming, i.e., optimal sequential decision making over time in the presence of uncertainties. The course will stress the mathematical foundations and will introduce the theory, computational aspect, and applications of dynamic programming for deterministic and stochastic problems.

Prerequisites  
OR 674/SYST 674 or permission of the instructor.

IT 776 - Real Analysis and Statistics

Credits: 3  
Cross-Listed with CSI 778


Prerequisites  
STAT 652; or ECE 620, 621, and 630.

Hours of Lecture or Seminar per week  
3

Hours of Lab or Studio per week  
0

IT 780 - Queuing Modeling of Computer-Communication Networks

Credits: 3  
Cross-Listed with OR 780

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.

Prerequisites  
OR 645 or 647, or ECE 542; or equivalent.
IT 782 - Advanced Topics in Combinatorial Optimization

Credits: 3  
Cross-Listed with OR 782  

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. May be repeated for credit when topics are distinctly different.

Prerequisites  
OR 641 and 642.

IT 783 - Advanced Topics in Network Optimization

Credits: 3  
Cross-Listed with OR 783  

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.

Prerequisites  
OR 643.

IT 784 - Advanced Topics in Nonlinear Programming

Credits: 3  
Cross-Listed with OR 784  

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. May be repeated for credit when topics are distinctly different.

Prerequisites  
OR 644.

IT 796 - Directed Reading and Research

Credits: 1-3  

Reading and research on specific topic in information technology under direction of faculty member.

Notes  
May be repeated as needed.
IT 797 - Directed Reading and Research

Credits: 1-3
Reading and research on specific topic in information technology under direction of faculty member.

Notes
May be repeated as needed.

IT 803 - Doctoral Tutorial in Information Technology

Credits: 3
Cross-Listed with CS 803
Individualized intensive study of particular aspects of information technology.

Notes
May be repeated as needed.

IT 804 - Doctoral Tutorial in Information Technology

Credits: 3
Cross-Listed with CS 804
Individualized intensive study of particular aspects of information technology.

Notes
May be repeated as needed.
**IT 809 - Scaling Technologies for E-business**

Credits: 3  
**Cross-Listed with** CS 809

From a quantitative point of view, discusses 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, and payment services, understanding customer behavior, workload characterization, scalability analysis, and performance prediction.

**Prerequisites**  
At least one operating systems and one networking course, and admission to VSITE doctoral program.

**Notes**  
Term paper and project required.

**IT 811 - Research Topics in Machine Learning and Influence**

Credits: 3  
**Cross-Listed with** CS 811

Presentation of 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. Students get hands-on experience by experimenting with state-of-the-art learning and inference systems, and working on projects tailored to research interests.

**Prerequisites**  
CS 680 and 681, or permission of instructor.

**IT 814 - Foundations of Computational Science**

Credits: 3  
**Cross-Listed with** CSI 701

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.

**Prerequisites**

CS 735 or equivalent.

**Hours of Lecture or Seminar per week**

3

**Hours of Lab or Studio per week**

0

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**IT 815 - Parallel Computation**

Credits: 3

**Cross-Listed with** CS 815

Topics illustrating contemporary thinking on architectures, application, development environments, algorithms, operating system related issues, language requirements, and performance for parallel computation.

**Prerequisites**

CS 635 or CSI 801.

**Hours of Lecture or Seminar per week**

3

**Hours of Lab or Studio per week**

0

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**IT 817 - Neural Networks**

Credits: 3

**Cross-Listed with** CS 817

Study of adaptive and competitive principles using distributed and parallel computation. Topics include background from statistics, control, adaptive signal processing, and neurosciences. Basic models, such as those suggested by Grossberg, Hopfield, and Kohonen, are discussed in terms of analytical characteristics and applications. Neural networks assessed as universal approximators. Presents connections to fuzzy approach established through radial basis function approach. Presents applications to perception, knowledge-based systems, and robotics.

**Prerequisites**

CS 688, or permission of instructor.

**Hours of Lecture or Seminar per week**

3

**Hours of Lab or Studio per week**

0
IT 818 - Topics in Computer Systems

Cross-Listed with CS 818

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.

IT 819 - Computational Models for Probabilistic Inference

Credits: 3
Graphical models for encoding conditional independence assumptions in a multivariate discrete probability distribution. Includes computational methods for updating probabilities when evidence is observed on some variables in model. Algorithms for finding most probable instantiation of network. Applications in expert systems and decision analysis.

Prerequisites
SYST 664 or 652

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

IT 821 - Software Engineering Seminar

Credits: 3
Study of application of software engineering principles, design methods, and support tools through real-life problems extracted from faculty and industry projects.

Prerequisites
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

IT 822 - Software Maintenance and Reuse
Cross-Listed with CS 732

Perfective maintenance, reuse of software components and patterns, evolving software systems, principles of object-oriented analysis and development. Presents issues regarding technologies supporting perfective software maintenance and reuse.

Prerequisites
CS/SWE 621 or equivalent, data structures, principles of modern programming, and discrete mathematics; or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

IT 823 - Software for Critical Systems

Credits: 3
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.

Prerequisites
SWE 620 and STAT 554

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

IT 824 - Program Analysis for Software Testing

Credits: 3
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.

Prerequisites
CS 540 or CS/SWE 637, or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0
IT 825 - Special Topics in Web-based Software

Credits: 3
Cross-Listed with SWE 825

Advanced topics in specifying, designing, modeling, developing, deploying, testing, and maintaining software written as web applications and web services.

Prerequisites

Notes
May be repeated with change in topic.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

IT 830 - Detection and Estimation Theory

Credits: 3
Cross-Listed with ECE 734

Introduction to detection and estimation theory with communication applications. Topics include M-hypotheses, Bayes, minimax, Neyman-Pearson criterion, detection of signals in AWGN and ACGN, Bayes estimation, ML estimation of signal parameters in AWGN and ACGN, estimation of Gaussian waveforms in Gaussian noise, linear MSE estimation, and Kalman and Wiener filters.

Prerequisites
ECE 528, or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

IT 832 - Data Compression

Credits: 3
Cross-Listed with ECE 735

In-depth study of lossy data compression techniques based on vector quantization with application to speech, image, and video signals. Covers vector quantization of both signal's waveform and commonly used parametric statistical models such as the autoregressive model. Topics include scalar quantization, predictive quantization, transform coding, entropy coding, and variations on basic vector quantization such as constrained vector quantization and variable rate vector quantization.

Prerequisites
ECE 528, or permission of instructor.
IT 833 - Satellite Communication

Credits: 3
Cross-Listed with ECE 739

Introduces theory and applications of modern satellite communications. Topics include satellite channel characterization, channel impairment and transmission degradation, link calculations, modulation, coding, multiple access, broadcasting, random access schemes, demand assignment, synchronization, satellite switching and onboard processing, integrated service digital satellite networks, and satellite transponder, ground stations, packet switching, and optical satellite communications.

Prerequisites
ECE 631.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

IT 834 - Telecommunications Networks

Credits: 3
Cross-Listed with ECE 742

Open systems interconnection reference model, analysis and modeling of layered network architectures including transport and higher layers, performance evaluation of system network architecture, DEC network architecture, and other telecommunication architectures. Protocols and standards for local, metropolitan, and wide area networks are also discussed. Topics include high-speed packet switching, broadband multimedia protocols, and congestion control in broadband integrated networks.

Prerequisites
ECE 528 and 642, or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

IT 835 - Computational Vision

Credits: 3
Cross-Listed with CS 835
Study of 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.

**Prerequisites**
CS 682 and 686, or permission of instructor.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**IT 836 - Special Topics in Detection and Estimation Theory**

Credits: 3
Cross-Listed with ECE 836

Advanced topics in detection, estimation, and signal processing in areas of current research interest. Topics may include spectral estimation, speech recognition, array processing, SAR, underwater acoustics, or higher order spectra.

**Prerequisites**
ECE 734

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**IT 837 - Optimum Array Processing I**

Credits: 3
Cross-Listed with ECE 754


**Prerequisites**
ECE 734

**Notes**
Diagonal loading.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0
IT 838 - Signal Processing Algorithms and Architectures

Credits: 3
Cross-Listed with ECE 638

Study of recent advances in development of fast signal processing algorithms and parallel architectures. Topics include fast transforms, multirate processing of digital signals, adaptive filtering, high-resolution spectral analysis, parallel computational arrays, and mapping of signal processing algorithms into array processors.

Prerequisites
ECE 635 or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

IT 840 - Intelligent Systems for Robots

Credits: 3
Cross-Listed with CS 685/ECE 750/SYST 672/CS 840

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.

Prerequisites
SYST 611, ECE 650, CS 580, and SYST 555; or equivalent.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

IT 841 - Kalman Filtering with Applications

Credits: 3
Cross-Listed with ECE 722

Detailed treatment of Kalman Filtering Theory and 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 framework of Kalman filtering. Additional topics are nonlinear filtering problems, computational methods, and various applications such as global positioning system, tracking, and system control. Stochastic control problems include linear-quadratic-Gaussian problem and minimum variance control.

Prerequisites
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

IT 842 - Models of Probabilistic Reasoning

Credits: 3
Cross-Listed with SYST 842 OR 842

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.

Prerequisites
STAT 544 or OR 681, or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

IT 843 - Multivariable and Robust Control

Credits: 3
Cross-Listed with ECE 720

Eigenstructure assignment for multivariable systems, the Smith- McMillan form, internal stability, modeling system uncertainty, performance specifications and principal gains, parametrization of controllers, loop shaping and loop transfer recovery, and the H\(_\infty\) methodology.

Prerequisites
ECE 620, or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

IT 844 - Advanced Pattern Recognition

Credits: 3

Course covers model selection, statistical learning theory, structural risk minimization, support vector machine and regression, semisupervised learning and transduction, change detection, and mixtures of experts such as AdaBoost. Applications related to link analysis for social networks and forensics, collaborative filtering and recommendation systems, and document analysis.
Prerequisites
CS 688 or permission of the instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

IT 845 - High-Frequency Electronics

Credits: 3
Cross-Listed with ECE 780

Study of devices and circuits used in highspeed communication systems. Topics include microwave bipolar transistors, GaAs MOSFETs, and high-speed integrated circuits, and design of linear and power amplifiers using S-parameter techniques and computer simulation.

Prerequisites
ECE 520

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

IT 846 - Nonlinear Systems

Credits: 3
Cross-Listed with ECE 721

Nonlinear dynamical systems. Motivating examples. Analysis techniques include basic fixed point theory, implicit function theorem, dependence of trajectories on initial data and parameters. Also covers computational simulation techniques; stability theory, including Lyapunov's direct method; and nonlinear control systems input-output stability, absolute stability, and strong positive real transfer functions. Includes feedback linearization of nonlinear systems; nonlinear canonical forms; nonlinear decoupling; sliding control; and applications to adaptive control, neural networks, and robotics.

Prerequisites
ECE 521

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

IT 847 - Topics in Photonics
Credits: 3  
**Cross-Listed with** ECE 847

In-depth discussion of specific topics in photonics. Topics include optical storage (disks, holographic, 3D), digital optical computing, integrated optics, photonic switching networks, and optoelectronic devices.

**Prerequisites**  
ECE 565 or permission of instructor.

**Notes**  
May be repeated when covering different topics.

**IT 848 - Digital Video Communications**

Credits: 3  
**Cross-Listed with** ECE 743

Coding, transport, and modeling of digital video signals; digital coding of waveforms with emphasis on compression techniques for video signals; transform coding including DCT and rate distortion theory for images; subband/wavelet coding of images; treatment of video signals for different television formats; colorimetry and motion estimation/compensation; general characterization of video traffic; modeling of variable bit rate video codecs; transport protocols for video and multimedia; network-delay compensation for video over ATM; VBR video flow control; and discussion of applications such as HDTV/TV over ATM, digital HDTV for terrestrial broadcast, and videoconferencing/desktop multimedia over LAN/WAN.

**Prerequisites**  
ECE 535 and 642

**Hours of Lecture or Seminar per week**  
3

**Hours of Lab or Studio per week**  
0

**IT 850 - Systems Integration Engineering**

Credits: 3  
**Cross-Listed with** SYST 850

Covers lifecycles; large systems composed of 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.
Prerequisites
SYST 510 or 520

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

IT 851 - Seminar: Topics in Software Requirements

Credits: 3
Emphasizes latest research ideas in requirements engineering domain. Discusses state-of-the-art and state-of-the-practice. Focuses on most critical problems and discusses how resolutions might further the requirements research knowledge base and enhance quality and productivity of real software and system developments in industry.

Prerequisites
SWE 620 or 624, or CS 624

Notes
May be repeated when topic is different.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

IT 852 - Graphical Real-Time Simulation

Credits: 3
Cross-Listed with CS 852

Current research in advanced computer graphics and its 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).

Prerequisites
CS 652 or IT 875

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

IT 860 - Software Analysis and Design of Real-Time Systems

Credits: 3
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.

Prerequisites
SWE 623

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

IT 861 - Distributed Database Management Systems

Credits: 3
Topics include transaction management, concurrency control, deadlocks, replicated database management, query processing reliability, and surveys of commercial systems and research prototypes.

Prerequisites
INFS 614 or equivalent.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

IT 862 - Computer Security Models and Architectures

Credits: 3
Covers large-scale distributed systems, including cross-enterprise systems; models for rolebased and lattice-based access control; and delegated administration with respect to formal and pragmatic criteria. Studies architectures to implement these models based on public-key infrastructure, trusted servers, and other components.

Prerequisites
ISA 562

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

IT 864 - Scientific Databases

Credits: 3
Studies 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 satellite.

**Prerequisites**
INFS 614

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

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**IT 865 - Networks and Distributed Systems Security**

Credits: 3  
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, nonrepudiation, 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.

**Prerequisites**
INFS 612 or equivalent.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

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**IT 867 - Intelligent Databases**

Credits: 3  
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.

**Prerequisites**
INFS 760, or permission of instructor.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

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**IT 870 - Organizational Informatics**
Credits: 3
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 discipline.

Prerequisites
Doctoral status, or permission of instructor.

Hours of Lecture or Seminar per week
0

Hours of Lab or Studio per week
0

IT 871 - Statistical Data Mining

Credits: 3
Cross-Listed with STAT 871

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.

Prerequisites
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
AS

IT 874 - Analysis of Complex Surveys

Credits: 3
Presents current theory and methods of statistical analysis of data from complex surveys of finite populations. Includes contingency table analysis and regression analysis; modeling structured populations by multilevel models; and loglinear, logistic, and regression models for stratified and multistage cluster samples. Case studies illustrate methodology.

Prerequisites
STAT 656, 665, and 674; or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

When Offered
IR
IT 875 - Scientific and Statistical Visualization

Credits: 3  
Cross-Listed with STAT 875

Presents visualization methods to provide new insights and intuition concerning measurements of natural phenomena and scientific and mathematical models. Presents case study examples from variety of disciplines. Topics include human perception and cognition, introduction to graphics laboratory, elements of graphing data, representation of space-time and vector variables, representation of 3D and higher dimensional data, dynamicgraphical methods, and virtual reality. Students required to work on visualization project. Emphasizes software tools on Silicon Graphics workstation, but other workstations and software may be used.

Prerequisites  
CS 652, STAT 554, STAT 663, or STAT 751; or permission of instructor.

Hours of Lecture or Seminar per week  
3

Hours of Lab or Studio per week  
0

IT 876 - Measure and Linear Spaces

Credits: 3  
Cross-Listed with CSI 876

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.

Prerequisites  
STAT 544 and MATH 315.

Hours of Lecture or Seminar per week  
3

Hours of Lab or Studio per week  
0

When Offered  
AF

IT 877 - Geometric Methods in Statistics

Credits: 3  
Cross-Listed with CSI 877/STAT 877

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 and tessellations of 2-, 3-, and n-dimensional spaces. Examples include applications to statistics and scientific visualization.

Prerequisites
STAT 751, or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

When Offered
AF

IT 885 - Spectral Estimation

Credits: 3
Cross-Listed with ECE 752

In-depth study of spectral analysis and its 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 its relation to autoregression modeling; signal subspace approaches for frequency estimation; and wavelet transform and its relation to short-time Fourier transform.

Prerequisites
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

IT 886 - Information Theory

Credits: 3
Cross-Listed with ECE 751

Introduces the mathematical theory of communication systems. Topics include 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 channelcoding theorem; joint source-channel coding theorem; differential entropy; Gaussian channel; rate distortion theory; and vector quantization.

Prerequisites
ECE 630 or STAT 644 or equivalent, or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0
IT 888 - Distributed Estimation and Multisensor Tracking and Fusion

Credits: 3
Cross-Listed with ECE 753/OR 888/SYST 888

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.

Prerequisites
ECE 734 or SYST 611

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

IT 890 - Special Topics in Urban Transportation

Credits: 3
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.

Prerequisites
CEIE 560 and 660 or equivalent; or permission of instructor.

Notes
May be repeated for credit when topic distinctly different.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

IT 891 - Special Topics in Applications of Information Technology to Urban Systems Engineering

Credits: 3
Topics include inventive engineering, design engineering, network computing, building and using intelligent agents in engineering, and proactive design.

Prerequisites
CEIE 670, or permission of instructor.

Notes
May be repeated for credit when topics distinctly different.

**IT 892 - Special Topics in Environmental and Water Resource Systems Engineering**

Credits: 3  
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.

**Prerequisites**  
CEIE 601

**Notes**  
May be repeated for credit when topics distinctly different.

**Hours of Lecture or Seminar per week**  
3

**Hours of Lab or Studio per week**  
0

**IT 894 - Design and Inventive Engineering**

Credits: 3  
Topics include evolution of engineering, design engineering, inventive engineering, general design methodology, conceptual versus detailed design, axiomatic and inferential design theories, engineering method in design, design paradigms, case-based and proactive design, design evaluation, virtual design studio, Internet and browsers in design, creative problem solving, and computer tools to support design creativity.

**Prerequisites**  
SYST 573, CEIE 670, or OR 681; or permission of instructor.

**Hours of Lecture or Seminar per week**  
3

**Hours of Lab or Studio per week**  
0

**IT 910 - Research Topics in Artificial Intelligence**

Credits: 3  
**Cross-Listed with** CS 910
Special topics not occurring in regular computer science sequence. Requires substantial student participation. Subject matter may include continuation of existing 600- or 700-level courses in artificial intelligence.

**Prerequisites**
Graduate course in artificial intelligence.

**Notes**
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

**IT 915 - Research Topics in Parallel Computation**

Credits: 3
Cross-Listed with CS 915

Discusses current research topics in parallel computation. Topics vary according to student and faculty interest. Possible topics include formal models of concurrency, specification and design of parallel programming languages, logic programming in parallel environment, and parallel distributed processing (neural networks).

**Prerequisites**
IT 815

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**IT 922 - Concurrent Object-Oriented Systems**

Credits: 3
Comparative study of existing concurrent object-oriented approaches to problem analysis and software construction. Introduces current research issues in concurrent object-oriented systems, concurrency models, and concurrent object-oriented programming languages and development tools.

**Prerequisites**
IT 822

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**IT 932 - Spread Spectrum Communications**
Fundamentals of spread spectrum communications. Major topics include pseudonoise spread spectrum systems, acquisition, synchronization, timehopping, frequency hopping, and multiple access communication.

**Prerequisites**
ECE 731

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**IT 937 - Optimum Array Processing II**

Includes adaptive beamformers; SMI and RLS estimators; spatial smoothing and FB averaging; QR decomposition; LMS algorithm; optimum detection; parameter, UML, and CML estimation; Cramer-Rao bounds; IQML; weighted subspace fitting; subspace algorithms such as MUSIC and ESPRIT; root-versions; beam-space algorithms; and sensitivity, robustness, and calibration.

**Prerequisites**
IT 837

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**IT 940 - Advanced Topics in Computer Vision and Robotics**

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.

**Prerequisites**
CS 682 or 685, or permission of instructor depending on topics offered.

**Notes**
Course may be repeated with change of topic.
IT 941 - System Identification and Adaptive Control

Credits: 3
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.

Prerequisites
ECE 621, or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

IT 944 - The Process of Discovery and Its Enhancement in Engineering Applications

Credits: 3
Cross-Listed with OR 944, SYST 944

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.

Prerequisites
IT 842, or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

IT 945 - Advanced Topics in Microelectronics

Credits: 3
Cross-Listed with ECE 945

Current topics of advanced research in microelectronics. Topics include very high-speed integrated circuits, monolithic microwave integrated circuits, optoelectronic integrated circuits, novel device structures, and advances in semiconductor device technology.

Prerequisites
IT 845

Notes
May be repeated with change in topic.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

IT 950 - Design and Management Aspects of Information Systems

Credits: 3
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.

Prerequisites
INFS 790 or equivalent.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

IT 958 - Basic and Applied Decision Support Systems Technology

Credits: 3
Analyzes tools, techniques, and methods that contribute to design, development, application, and evaluation of interactive computer-based decision support systems. Analyzes state-of-the-art and state-of-the-expectation of basic and applied decision support systems technologies.

Prerequisites
SYST 642

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

IT 962 - Advanced Topics in Computer Security

Credits: 3
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.

**Prerequisites**
IT 862 or 865, or permission of instructor.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**IT 971 - Probability Theory**

Credits: 3
Cross-Listed with STAT 971

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.

**Prerequisites**
STAT 544 and MATH 315.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**When Offered**
AS

**IT 972 - Mathematical Statistics I**

Credits: 3
Cross-Listed with STAT 972/CSI 972

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.

**Prerequisites**
STAT 652/CSI 672 or equivalent, and either IT 876/STAT 876/CSI 876 or IT 971/STAT 971.

**Hours of Lecture or Seminar per week**
3

**When Offered**
AF
IT 973 - Mathematical Statistics II

Credits: 3
Cross-Listed with STAT 973/CSI 973

Continuation of IT 972/STAT 972/CSI 972. Concentrates on theory of hypothesis testing. Topics include characterizing decision process, simple versus complex 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.

Prerequisites
IT 972/STAT 972/CSI 972

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

When Offered
AS

IT 976 - Statistical Inference for Stochastic Processes

Credits: 3
Cross-Listed with CSI 976

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.

Prerequisites
IT 746/CSI 776

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

When Offered
AS

IT 978 - Statistical Analysis of Signals

Credits: 3
Cross-Listed with CSI 978

Advanced course in analysis of discrete- and continuous-time signals using methods of stochastic differential equations and time series. Presumes familiarity with methods of harmonic analysis and times series modeling. Topics include statespace modeling and eigen-value processing, nonlinear modeling of signals, non-Gaussian stochastic process structure, detection and estimation of vector-valued signals, robust signal detection, with applications to array processing and target tracking.
Prerequisites
STAT 544 and 658, or equivalent.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

IT 979 - Topics in Statistical Aspects of Information Technology

Credits: 3
Cross-Listed with CSI 979

Studies statistical science and body of methods and techniques that convert raw data into information. Topics include high-interaction statistical graphics, stochastic methods for parallel computing, cryptography and covert communications, order-restricted inference, treatments of imprecision, and foundations of inference.

Prerequisites
STAT 652 or equivalent.

Notes
Contents vary. May be repeated when topics distinctly different.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

IT 980 - Advanced Topics in Applied Probability

Credits: 3

Special topics and recent developments in field of applied probability. May include computational probability, stochastic point processes, advanced queuing theory, traffic and transportation models, percolation, processes of random aggregation and coagulation, and Markov decision processes.

Prerequisites
OR 645 and 647, or permission of instructor depending on semester topics.

Notes
May be repeated for credit when topics distinctly different.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0
IT 981 - Advanced Topics in Optimization

Credits: 3
Special topics and recent developments. Contents vary and may include topics in linear, nonlinear, combinatorial, network, global, or stochastic optimization. Prepares students to perform research in optimization, and requires active student participation.

Prerequisites
IT 741, 750, 881, 882, or 884

Notes
May be repeated for credit when topics distinctly different.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

IT 990 - Dissertation Topic Presentation

Credits: 1
Cross-Listed with CS 990

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.

Prerequisites
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
0

Hours of Lab or Studio per week
0

IT 991 - Engineer Project Presentation

Credits: 1
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.

Prerequisites
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.
**IT 996 - Engineer Project Proposal**

Credits: 1-6  
Work on project proposal that forms basis for dissertation for engineer degree.

**Notes**  
May be repeated. No more than 12 credits of IT 996 and 997 may be applied to engineer degree requirements.

**IT 997 - Engineer Project Dissertation**

Credits: 1-6  
Formal record of commitment to engineer project dissertation under direction of advisory committee in information technology.

**Prerequisites**  
Admission to candidacy.

**Notes**  
May be repeated as needed.

**IT 998 - Doctoral Dissertation Proposal**

Credits: 1-12  
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.
IT 999 - Doctoral Dissertation

Credits: 1-12
Formal record of commitment to doctoral dissertation research under direction of faculty member in information technology.

Prerequisites
Admission to candidacy.

Notes
May be repeated as needed.

ITAL 101 - Elementary Italian I

Credits: 3
Designed for students with no prior knowledge of Italian. Includes elements of grammar, vocabulary, oral skills, listening comprehension, and reading.

Notes
Lab work required. 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
1

ITAL 102 - Elementary Italian II

Credits: 3
Continuation of ITAL 101.

Prerequisites
ITAL 101 or permission of instructor.

Notes
Lab work required. 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
1

ITAL 110 - Elementary Italian
Credits: 6
Introduces elements of grammar, vocabulary, oral skills, listening comprehension, and reading.

Notes
Lab work required. Students may not receive credit for ITAL 110 and ITAL 101 or 102.

Hours of Lecture or Seminar per week
6
Hours of Lab or Studio per week
1

ITAL 201 - Intermediate Italian I

Credits: 3
Further development of skills in listening, speaking, and writing.

Prerequisites
ITAL 102 or permission of department.

Notes
ITAL 201 and 202 must be taken in sequence. Lab work required. Students may not receive credit for ITAL 201 and ITAL 210.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
1

ITAL 202 - Intermediate Italian II

Credits: 3
Application of language skills to reading, composition, and discussion.

Prerequisites
ITAL 201 or permission of department.

Notes
Students may not receive credit for ITAL 202 and ITAL 210.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
1

ITAL 210 - Intermediate Italian

Credits: 3
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.

**Prerequisites**
ITAL 110 or appropriate placement score.

**Notes**
Lab work required. Students may not receive credit for ITAL 210 and ITAL 201 or 202.

**ITAL 250 - Gateway to Advanced Italian**

Credits: 3
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.

**Prerequisites**
ITAL 210; appropriate placement score; or permission of department.

**Notes**
Taught in Italian.

**ITAL 325 - Major Italian Writers**

Credits: 3
Works of major Italian or Italian-American authors in translation. Writers to be studied vary. Course work in English.

**Prerequisites**
ENGL 101 or equivalent; or permission of instructor

**ITAL 330 - Advanced Italian: Language and Culture**
Credits: 3
Develop linguistic and critical proficiency in Italian language and culture for students who have completed intermediate studies in Italian. Analyze authentic texts that reveal the diversity of Italian experience in regional, national and international contexts. Foster advanced reading, writing, speaking, and listening skills that will enable students to understand and to critique Italian with greater ease and sophistication.

Prerequisites
ITAL 250; appropriate placement score; or permission of instructor

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

ITRN 500 - Approaches to International Commerce and Policy

Credits: 4
First foundation course in ICP program. Introduces national economic policy and international trade, investment, and finance. Uses case-study method to teach basic economic concepts such as national income accounting, balance of payments, and factors affecting foreign exchange rates. Also provides practice in comparing national strategies for growth and development, and using political and economic analysis to assess choice of national economic strategy and relative effectiveness.

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
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
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.
ITRN 504 - Trade and Microeconomics for International Commerce

Credits: 4
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
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
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
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
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
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
Provides opportunity for study abroad under supervision of Mason faculty.

Notes
Course topics, content, and locations vary.

**ITRN 710 - International Business Transactions: Finance and Investment**

Credits: 3
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
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.

**Prerequisites**
ITRN 603 or permission of instructor.

**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
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 713 - U.S. Foreign and Economic Decision Making

Credits: 3
Identifies and assesses approaches to foreign policy decision making within the United States and offices involved with political and trade issues. Examines congressional and executive processes and their interrelationship. Exercises involve historical and simulated cases; gives attention to conflicting interests of private and institutional entities. Assesses tension between political and economic issues within context of national security concerns.

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
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
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
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.

**ITRN 718 - Global Economic and Human Development**

Credits: 3  
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.

**ITRN 720 - Regional and Supranational Organizations**

Credits: 3  
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 730 - Information Technology Fundamentals for International Business and Trade**

Credits: 3  
Deals with technology and issues relating to emergence of computing, information, and telecommunications technologies in mainstream society. Aim is to provide general understanding and facility with technologies of contemporary interest.
ITRN 731 - Business-to-Business Marketing in International Commerce

Credits: 3
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
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
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 737 - World Trade in Semiconductors and Information Technologies

Credits: 3
Examines bilateral and multilateral approaches to world trade in technology products. Compares U.S.-Japan Agreement on Semiconductors and its successor agreements with those of WTO. Also looks at effects of agreements on U.S. industry, their relevance to trade development, and commercial transactions.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0
ITRN 738 - Fundamentals of International Marketing

Credits: 3
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

Credits: 3
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
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
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
ITRN 750 - Trade and Politics in Eastern Europe and the Former Soviet Union

Credits: 3
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 751 - Trade, Investment, and Politics in the Western Hemisphere

Credits: 3
Examines cultural, political, economic, and legal aspects of conducting business and trade with countries of Western hemisphere. Focuses on evolving pattern of inter- and intra-hemisphere trade, as well as on region's global trade integration. Special attention given to NAFTA and other bilateral and regional agreements, and potential for and implications of free trade area in hemisphere. Emphasizes manipulation and analysis of regional trade data to describe and project trade patterns.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

ITRN 752 - International Business Lobbying in the United States, Europe, and Japan

Credits: 3
Presents comparative overview of lobbying process and practices, and explores representation of foreign firms in United States, European Community and member states, and Japan. Examines contemporary problems relating to lobbying by multinational corporations in foreign political and cultural setting.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

ITRN 753 - Role of States and Virginia in the Global Economy
Credits: 3
Examines roles of states, especially Virginia, in the international marketplace. Focuses on formulating specific export marketing plans for particular Virginia firms and industries. Examines state economic development policies, structure of state agencies, services, and resources available to domestic exporter and foreign investors contemplating direct investment.

**ITRN 754 - International Commercialization of Space**

Credits: 3
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.

**ITRN 756 - National Security and the Global Economy**

Credits: 3
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.

**ITRN 757 - Business and Politics in Emerging Markets**

Credits: 3
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
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
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
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.

**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
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.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

ITRN 763 - International Real Estate Transactions

Credits: 3
Provides overview of real estate market in the United States with emphasis on commercial real estate and issues of importance to national and international investors. Reviews recent developments in valuation approaches, marketing strategies, and performance trends. Discusses increasing use of securitization along with implications for traditional originators of mortgage financing. Emphasizes government experience and practices in real estate management and disposition.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

ITRN 764 - Trade, Investment, and Politics in East Asia

Credits: 3
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
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.
ITRN 766 - Trade, Investment, and Politics in the Middle East and North Africa

Credits: 3
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
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
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
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
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
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
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
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
Provides practical work experience in state, federal, or international agencies or private sector. Requires written project integrating work experience and academic program.

Notes
Open to authorized graduate majors only; departmental and advisor approval required before enrolling.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

ITRN 790 - Independent Study

Credits: 1-3
Provides opportunity to pursue intensive research in area of interest not covered by other courses.

Notes
Open to authorized graduate majors only; departmental and advisor approval required before enrolling. 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
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.

**ITRN 795 - Final Project**

Credits: 1-3
Includes writing 40-page capstone paper that draws together key themes of program.

**JAPA 101 - Introduction to the Japanese Language**

Credits: 3
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.

**JAPA 102 - Introduction to the Japanese Language**

Credits: 3
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.

**JAPA 109 - Intensive Japanese I**
Credits: 6
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
Introduces elements of grammar, vocabulary, oral skills, listening comprehension, and reading.

Notes
Lab work required. 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
1

JAPA 201 - Intermediate Japanese I

Credits: 3
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.

Prerequisites
JAPA 102 or equivalent.

Notes
Lab work required. 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
Continuation of JAPA 201.
**Prerequisites**
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
Equivalent to JAPA 201, 202 taught in a single semester.

**Prerequisites**
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
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 Japanese-speaking regions.

**Prerequisites**
JAPA 110 or appropriate placement score.

**Notes**
Lab work required. 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**
1

**JAPA 250 - Gateway to Advanced Japanese**
Credits: 3
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.

Prerequisites
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 320 - Japanese Cinema

Credits: 3
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. Course work in English. Knowledge of Japanese history, communication, and cultural studies or film and media studies helpful.

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
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.

Prerequisites
JAPA 250, appropriate placement score, or permission of instructor.

Notes
Courses must be taken in sequence.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

JAPA 331 - Advanced Reading and Speaking II
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.

**Prerequisites**
JAPA 202, 330, and appropriate placement score; or permission of instructor.

**Notes**
Courses must be taken in sequence.

**JAPA 440 - Integrated Study of Japanese Language and Society I**

Credits: 3
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.

**Prerequisites**
JAPA 331, appropriate placement score, or permission of instructor.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**JAPA 441 - Integrated Study of Japanese Language and Society II**

Credits: 3
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. More emphasis on actual use of Japanese language.

**Prerequisites**
JAPA 440, appropriate placement score, or permission of instructor.

**Notes**
Sequel to JAPA 440.
JLCP 509 - Justice Organizations and Processes

Credits: 3
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.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

JLCP 510 - Policing in a Democratic Society

Credits: 3
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.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

JLCP 691 - Justice Program Planning and Implementation

Credits: 3
Examines challenges of adapting to, planning, and implementing change in justice organizations. Provides hands-on experience in conducting, planning, and implementing project.

Prerequisites
JLCP 700 or PUAD 502, or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

JLCP 700 - Theories of Justice

Credits: 3
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
JLCP 702 - Comparative Justice

Credits: 3
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.

Prerequisites
JLCP 700/GOVT 726, or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

JLCP 703 - Restorative Justice

Credits: 3
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.

Prerequisites
JLCP 700 or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

JLCP 720 - Behavior of Law

Credits: 3
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.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

JLCP 721 - The Constitution, Criminal Procedure, and Security
Credits: 3
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.

Prerequisites
JLCP 720/GOVT 728 or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

JLCP 722 - Civil Justice

Credits: 3
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.

Prerequisites
JLCP 720/GOVT 728 or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

JLCP 723 - Law and Social Control

Credits: 3
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.

Prerequisites
JLCP 720/GOVT 728 or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

JLCP 730 - Seminar in the Courts and Constitutional Law

Credits: 3
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.

Hours of Lecture or Seminar per week
JLCP 740 - Justice Organization and Administration

Credits: 3
Examines organization and administration of justice and security organizations. Covers organization theory and behavior as applied to justice and security organizations.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

JLCP 741 - Conduct of Justice Organizations at the Street Level

Credits: 3
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).

Prerequisites
JLCP 740/GOVT 790 or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

JLCP 742 - Leadership in Justice and Security Organizations

Credits: 3
Examines leadership theories, and explores fundamental questions about leadership in justice and security organizations today.

Prerequisites
JLCP 740/PUAD 790 or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

JLCP 743 - Changing Justice and Security Organizations
Credits: 3
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.

**Prerequisites**
JLCP 740/PUAD790 or permission of instructor.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

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**JLCP 749 - Issues in Justice Administration**

Credits: 1-3
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.

**Prerequisites**
JLCP 509/PUAD 509 or JLCP 700/GOVT 726, or permission of instructor.

**Hours of Lecture or Seminar per week**
1-3

**Hours of Lab or Studio per week**
0

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**JLCP 760 - Crime and Crime Policy**

Credits: 3
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.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

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**JLCP 761 - Politics of Crime Policy**

Credits: 3
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.

**Prerequisites**
JLCP 760/GOVT 792 or permission of instructor.

**Hours of Lecture or Seminar per week**
JLCP 780 - Research Methods

Credits: 3
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.

Prerequisites
Undergraduate course in social science research methods or statistics, or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

JLCP 781 - Justice Program Evaluation

Credits: 3
Practical exploration of assessment techniques used in evaluating need for and consequences of justice programs and policies. Design and measurement, interpreting and presenting results.

Prerequisites
PUAD 611/612, JLCP 780, or two graduate-level statistics courses; or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

JLCP 782 - Statistics I

Credits: 3
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.

Prerequisites
An undergraduate social science research methods course or an undergraduate statistics course.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0
JLCP 783 - Statistics II

Credits: 3
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.

Prerequisites
JLCP 782 or a comparable course.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

JLCP 790 - Practicum in Justice, Law, Crime, and Security

Credits: 1-6
Student-initiated research project supervised by faculty member. Students must work with justice organization to conduct useful research.

Prerequisites
JLCP 780, and either STAT 510 and 535 or STAT 554 and 656; or permission of instructor.

Hours of Lecture or Seminar per week
0

Hours of Lab or Studio per week
0

JLCP 795 - Special Topics

Credits: 3
Recent developments in field, or topics not covered by regularly listed courses.

Prerequisites
To be determined by instructor.

Notes
Course content varies; may be repeated for credit.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0
JLCP 796 - Directed Reading

Credits: 1-3
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 JLCP program.

Prerequisites
Successful completion of 12 JLCP credits.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
0

JLCP 799 - Master's Thesis

Credits: 1-6
Research on approved master's thesis topic under direction of thesis committee with approval of chair.

Prerequisites
Submission and approval of thesis proposal.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
0
Grading
S/NC

JLCP 998 - Doctoral Dissertation Proposal

Credits: 1-6
Work on a research proposal forming basis for doctoral dissertation.

Prerequisites
Advancement to doctoral candidacy

Notes
Repeatable. Minimum 3, maximum 6 credits for doctorate. Maximum of 24 credits of JLCP 998/999 applicable to doctoral degree requirements.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
0
Grading
S/NC
JLCP 999 - Doctoral Dissertation Research

Credits: 1-12
Doctoral dissertation research and writing under direction of student's dissertation committee.

Prerequisites
Approval of dissertation proposal

Notes
Repeatable. Minimum 12, maximum 21 credits for doctorate. Maximum of 24 credits of JLCP 998/999 applicable to doctoral degree requirements.

KORE 110 - Elementary Korean

Credits: 6
Introduces elements of grammar, vocabulary, oral skills, listening comprehension, and reading.

Notes
Lab work required.

KORE 201 - Intermediate Korean I

Credits: 3
Continuation of basic Korean listening, speaking, reading, and writing skills. Online and lab work required.

Prerequisites
KORE 102, appropriate placement score, or permission of department

Notes
Students may not receive credit for KORE 201 and KORE 210.
KORE 202 - Intermediate Korean II

Credits: 3
Continuation of KORE 201. Online and lab work required.

Prerequisites
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

Credits: 3
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.

Prerequisites
KORE 110 or appropriate placement score.

Notes
Lab work required. 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
1

LAS 100 - Introduction to Latin American Studies

Credits: 1
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
PASS/FAIL
LAS 490 - Internship

Credits: 1
Approved work-study programs in cooperation with specific organizations including area museums; NGOs; and local, state and federal agencies.

Prerequisites
Latin American studies majors with permission of director.

Notes
Credit determined by LAS program.

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
Directed readings on specialized topic in Latin American Studies to prepare students for LAS 492, the honors research seminar in the major.

Prerequisites
admission to Latin American studies honors program.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

LAS 492 - Honors Research Seminar in Latin American Studies

Credits: 3
Honors-level 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.

Prerequisites
LAS 491; 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
LAS 499 - Research Seminar in Latin American Studies

Credits: 3
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.

Prerequisites
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

LATN 101 - Elementary Latin

Credits: 3
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

LATN 102 - Elementary Latin

Credits: 3
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.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

LATN 109 - Intensive Elementary Latin
Credits: 6
Equivalent to LATN 101 and 102 and taught in a single semester. 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.

Hours of Lecture or Seminar per week
6

Hours of Lab or Studio per week
0

LATN 201 - Intermediate Latin I

Credits: 3
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.

Prerequisites
LATN 102 or equivalent.

Notes
Students may not receive credit for LATN 201 and LATN 209.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

LATN 202 - Intermediate Latin II

Credits: 3
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.

Prerequisites
LATN 201 or equivalent.

Notes
Students may not receive credit for LATN 202 and LATN 209.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

LATN 209 - Intensive Intermediate Latin
Credits: 6
Equivalent to LATN 201 and 202, and taught in single semester.

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 321 - Latin Tutorial

Credits: 1-3
Latin readings drawn from classical or post-classical literature. Authors or genres selected by instructor in consultation with student. Meetings on tutorial basis.

Prerequisites
LATN 202 or equivalent, and permission of program chair.

Notes
May be repeated once.

Hours of Lecture or Seminar per week
0

Hours of Lab or Studio per week
0

LATN 351 - Roman Prose Literature

Credits: 3
Introduces major work of prose, themes, and literary qualities. Emphasizes interpretation and stylistic analysis. Concentrates on one complete work; topics, authors vary.

Prerequisites
LATN 202 or equivalent.

Notes
May be repeated once for credit.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

LATN 352 - Roman Poetry
Credits: 3
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.

Prerequisites
LATN 202 or equivalent.

Notes
May be repeated once for credit.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

LATN 451 - Studies in Roman Literature

Credits: 3
Focuses on single Latin author or literary genre. Approaches subject from variety of interpretive perspectives, and uses secondary literature as well as primary texts.

Prerequisites
LATN 351/352 or equivalent, or permission of instructor.

Notes
Topics and authors vary. Sequence may be repeated once for credit.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

LATN 452 - Studies in Roman Literature

Credits: 3
Focuses on single Latin author or literary genre. Approaches subject from variety of interpretive perspectives, and uses secondary literature as well as primary texts.

Prerequisites
LATN 351/352 or equivalent, or permission of instructor.

Notes
Topics and authors vary. Sequence may be repeated once for credit.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0
LING 322 - English Grammar

Credits: 3
Cross-Listed with ENGL 322

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.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

LING 326 - General Linguistics

Credits: 3
Introduces phonetics, phonology, morphology, and syntax.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

LING 450 - Introduction to Sociolinguistics

Credits: 3
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.

Prerequisites
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
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.

Prerequisites
LING 326.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**LING 486 - Syntax I**

Credits: 3
Nature and form of syntactic theory, and examination and analysis of the properties of several major natural language syntactic structures.

**Prerequisites**
LING 326.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**LING 490 - Generative Phonology**

Credits: 3
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.

**Prerequisites**
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
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.

**Prerequisites**
LING 326 and 3 other LING credits, and permission of instructor.

**Notes**
With instructor permission, may be taken twice for total 6 credits.
LING 507 - Field Work in Applied Linguistics

Credits: 3
Contact English Department one semester prior to enrollment. Field work providing working experience in language-teaching program or educational research organization.

Prerequisites
LING 326, 520, 521, or 582.

LING 520 - Descriptive Linguistics

Credits: 3
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
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.

Prerequisites
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
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.

Prerequisites
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 - Descriptive Aspects of English Phonetics and Phonology

Credits: 3
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
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.

Prerequisites
LING 521

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

LING 581 - Psycholinguistics

Credits: 3
Study of mental and psychological aspects of human language, including aphasia, association, autism, language acquisition, verbal concept formation, and perception.

Prerequisites
LING 520, 690, or 786; or permission of instructor.
**LING 582 - Second Language Acquisition**

Credits: 3
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.

**Prerequisites**
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
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.

**Prerequisites**
One of the following: LING 520, 523, 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
Detailed advanced study of selected area of linguistics.

**Prerequisites**
Varies with topic.

**Notes**
Content varies. May be repeated once for credit with permission of department.

**Hours of Lecture or Seminar per week**
3
LING 690 - Generative Phonology

Credits: 3
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
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.

Prerequisites
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
Recent trends in phonological theory. Topics include stress assignment, tone spreading, and vowel harmony, from within nonlinear framework. Discusses segmental structure and underspecification.

Prerequisites
LING 690.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

LING 770 - Research Methods
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.

**Prerequisites**
LING 582 and one of LING 690, 785, or 786; or permission of instructor.

**Hours of Lecture or Seminar per week**
0

**Hours of Lab or Studio per week**
0

**LING 782 - Second Language Acquisition II**

Credits: 3
Advanced course in second-language acquisition theory. Detailed analysis of internal and external constraints. Variation addressed from linguistic, psychological, and environmental perspectives.

**Prerequisites**
LING 582, or permission of instructor.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**LING 785 - Semantics and Pragmatics**

Credits: 3
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.

**Prerequisites**
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 786 - Syntax I**

Credits: 3
Nature and form of syntactic theory. Examines and analyzes properties of several major natural language syntactic structures.
LING 787 - Syntax II

Credits: 3
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.

Prerequisites
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
Advanced course in semantic and pragmatic theory. Study of meaning under truth-conditional, model-theoretic framework explored and related to syntax and pragmatics.

Prerequisites
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
Reading, research, and writing on specific project under direction of departmental member.

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 once for credit with permission.

Hours of Lecture or Seminar per week
0

Hours of Lab or Studio per week
0
LING 799 - Thesis

Credits: 1-6
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.

Notes
Open only to students who have completed at least 18 credits of LING courses.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
0
Grading
S/NC

LING 882 - Seminar in Language Acquisition

Credits: 3
Advanced topics seminar in current language acquisition theory.

Prerequisites
LING 782 or permission of instructor.

Notes
Topics vary. May be repeated twice.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

LING 886 - Advanced Syntax Seminar

Credits: 3
Advanced course in current syntactic theory.

Prerequisites
LING 786 or 787, or permission of instructor.

Notes
Topics vary. May be repeated twice.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0
LING 890 - Advanced Phonology Seminar

Credits: 3
Advanced topics seminar in current phonological theory.

Prerequisites
LING 692 or permission of instructor.

Notes
Topics vary. May be repeated twice.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

LING 898 - Advanced Independent Study

Credits: 3
Work on PhD qualifying paper.

Prerequisites
Completion of all linguistics core and seminar work in PhD program, or permission of instructor.

Notes
May be repeated once.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

LING 998 - Doctoral Dissertation Proposal

Credits: 1-6
Work on research proposal that forms basis for the doctoral dissertation.

Prerequisites
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
Doctoral dissertation research and writing under direction of student's dissertation committee.

Prerequisites
Completion of LING 998.

Hours of Lecture or Seminar per week
0

Hours of Lab or Studio per week
0

Grading
S/NC

LRNG 596 - Independent Study

Credits: 1-12
Covers research, analysis, and implementation within realm of social and organizational learning. Students work with member of program faculty.

Notes
May be repeated for credit.

Hours of Lecture or Seminar per week
0

Hours of Lab or Studio per week
0

LRNG 601 - Organizational Learning

Credits: 3
Re-examination of organizations and role of management from interpretive standpoint. Develops process view of organizations that identifies differences in interests, perspectives, and cultures among groups and explains role of management in facilitating understanding to achieve effective cooperation in a dynamic work environment. Themes include organizational culture, decision-making, collaborative communities, and teamwork, and "reading" of organizational change. Case studies and experiential exercises reinforce learning process.

Notes
Complements LRNG 672.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0
LRNG 602 - Group Dynamics and Team Learning

Credits: 3
Using unstructured learning environments, participants learn how to facilitate team learning for organizational effectiveness by engaging in meaningful group interaction. Explores various aspects of group dynamics such as power, perception, motivation, leadership, and decision making.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

LRNG 672 - Organizational Learning Laboratory

Credits: 3
Focuses on creating learning and experimental environment to explore questions and concerns typically faced by managers in effort to build learning organizations. Analyzes questions using experiential learning and action research. Classroom group interactions and group projects simulate real-world organizations. Object is to acquire competence to diagnose and analyze organizations and develop skills to become better facilitators of organizational learning.

Notes
Complements LRNG 601.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

LRNG 692 - Special Topics in LRNG

Credits: 1-3
Covers topics in social or organizational change seen from economic, historical, philosophical, literary, organizational, and information technology perspectives. New courses that first appear under this heading include Teaching Practicum: Instructional Technologies, Building Learning Organizations for Global Business, Computational Modeling of Social Learning, and Strategic Knowledge Management.

Notes
May be repeated for credit.

Hours of Lecture or Seminar per week
1-3
Hours of Lab or Studio per week
0

LRNG 714 - Ethnography of Corporate Culture
Corporate culture is not a simple byproduct of organizational charts and advertising images, but rather the web of meaning that endows organizational action with its deepest significance. Corporate cultures must be studied by ethnographic methods of "thick description." After exploring conceptions of corporate culture, course examines exemplary ethnographies of various organizations, including those of different societies, to prepare students for their own ethnographic field work and writing.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

LRNG 762 - Strategic Knowledge Management

Credits: 3
Deals with theory and practices of leveraging and sharing knowledge to develop more effective organizations. Focuses on knowledge and communities of practice, and includes use of collaborative technology in managing interactions.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

LRNG 763 - Technology and Learning in Organizations

Credits: 3
Examines enormous potential of information technology to enhance the way organizations work and learn. Focus includes user interface design and organizational processes that support effective use of this technology.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

LRNG 764 - Learning Across Cultures

Credits: 3
Focuses on ideas and practices involved in fostering learning, innovation, and new knowledge creation in the highly multicultural environments of knowledge-intensive global economies and political systems.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

LRNG 781 - Interpretive Social Theory
Credits: 3
Advanced philosophical study of interpretive school of economics sometimes known as the "Austrians." Weaves together Austrian ideas, epistemology, and hermeneutics; organizing theme is reinterpretation of Austrian school as radically interpretive approach to social theory. Course material is in the form of Folio Views hyper-text, which lends itself to close analysis of text and provides practical way of demonstrating and appreciating value of interpretive social theory.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

LRNG 792 - Special Topics in LRNG

Credits: 1-3
Covers topics in social or organizational change seen from economic, historical, philosophical, literary, organizational, and information technology perspectives. New courses that first appear under this heading include Teaching Practicum: Instructional Technologies, Building Learning Organizations for Global Business, Computational Modeling of Social Learning, and Strategic Knowledge Management.

Notes
May be repeated for credit.

Hours of Lecture or Seminar per week
1-3
Hours of Lab or Studio per week
0

LRNG 796 - Independent Study

Credits: 1-12
Requires research, analysis, and implementation within realm of social and organizational learning.

Notes
Students work with member of program faculty. May be repeated for credit.

Hours of Lecture or Seminar per week
1-12
Hours of Lab or Studio per week
0

MAIS 797 - Interdisciplinary Studies Proposal

Credits: 1
Focused work on formulating and writing MAIS project or thesis proposal.

Prerequisites
Degree candidacy in MAIS, and completion of 21 credits of graduate course work, including any required research methodology
MAIS 798 - Individualized Studies Project

Credits: 1-5  
Research project related to student's concentration taken under supervision of faculty advisor and project evaluation committee.

Prerequisites  
MAIS 797 and prior approval of a project proposal by the faculty advisors, two committee members, and MAIS director.

Notes  
Individualized section form required.

MAIS 799 - Individualized Studies Thesis

Credits: 1-5  
Original research endeavor related to student's MAIS program concentration. Research must result in document meeting MAIS and university standards.

Prerequisites  
MAIS 797 and prior approval of a thesis proposal by the faculty advisors, three committee members, and MAIS director.

Notes  
Individualized section form required.

MAM 503 - Information Technology for Arts Managers

Credits: 1  
Provides arts management students the opportunity to advance IT skills to required levels. Following skills assessment and seminar, students take three classes in campus media labs ranging from MS Office/Excel to advanced IT.

Prerequisites
Acceptance to graduate program in CVPA or permission of instructor.

**MAM 599 - Special Topics in Arts Management**

Credits: 1-6  
Provides opportunity to explore special and timely topics in arts management including theoretical and applied areas.

**Prerequisites**
Admission to MAM graduate program or permission of instructor.

**Notes**
Topics and credit vary; may be repeated for up to 12 credits if taken under different topics.

**MAM 601 - Fund Raising/Development in Arts**

Credits: 3  
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.

**Prerequisites**
Admission to graduate program in master of arts in arts management or permission of instructor.

**MAM 602 - Seminar in Arts Management**

Credits: 3  
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 of arts organizations, as well as a theoretical model for general management and practical tools.

**Prerequisites**
MAM 603 - Arts in Society

Credits: 3
Examines role of visual and performing arts as social and cultural institutions, with emphasis on historic traditions and trends that have most directly influenced contemporary American practice. Consideration is given to the essential functions of art in society in an effort to address questions: Why do we require art at all? 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? How do the various forms differ in their traditions, philosophical underpinnings, and current manifestations? How can arts managers participate in the cultural conversation to the benefit of art forms, artists, and the institutions they serve?

Prerequisites
Admission to a master's program in CVPA or permission of instructor.

MAM 604 - Public Relations and Marketing Strategies for the Arts

Credits: 3
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. Designed as fundamentals course for elective concentration in marketing and public relations.

Prerequisites
Admission to a graduate program in CVPA or permission of instructor.

Notes
MAM 602 should be taken prior to or concurrently with MAM 604.

MAM 606 - Board of Directors Management
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.

**Prerequisites**
Admission to master of arts in arts management or permission of instructor.

**MAM 607 - Fund Raising/Development in Arts II**

Credits: 3  
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.

**Prerequisites**
Admission to arts management program or permission of instructor.

**Hours of Lecture or Seminar per week**
0

**MAM 608 - Executive Management of Arts Communications**

Credits: 3  
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.

**Prerequisites**
MAM 604 Public Relations/Marketing Strategy for Arts

**Hours of Lecture or Seminar per week**
3
**Hours of Lab or Studio per week**
0

**MAM 609 - Facilities Management**

Credits: 3  
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.
MAM 704 - Finance and Budgeting for Arts Organizations

Credits: 3
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.

Prerequisites
Admission to CVPA graduate program, or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

MAM 705 - Budgeting/Finance for Arts Organizations II

Credits: 2
Introduces budgeting, planning, and finance as fundamentals of the strategic planning process and management control, specifically tailored to the needs of arts organizations.

Prerequisites
MAM 704.

Hours of Lecture or Seminar per week
2
Hours of Lab or Studio per week
0

MAM 706 - Festivals and Special Events

Credits: 3
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.

Prerequisites
Admission to arts management program or permission of instructor.

Hours of Lecture or Seminar per week

MAM 710 - Arts Policy

Credits: 3
Reviews current state of nonprofit arts field, then familiarizes students with the 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 the need for government support and artistic integrity with push and pull of the market. Compares U.S. policies to those of other developed countries.

MAM 711 - Directed Readings and Project Course

Credits: 1-6
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, fund-raising and development, entrepreneurial project work, arts marketing, arts policy and law, or other specialized areas pertinent to arts administration.

MAM 712 - Grant Writing in the Arts

Credits: 1
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.

Prerequisites
Admission to master of arts in arts management or permission of instructor.

MAM 740 - Internal Internship-Laboratory Rotation
Credits: 2
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 84 hours.

Prerequisites
Admission to master of arts in arts management.

Notes
12 credits taken within the master in arts management program; or permission of program director. Required for developing practical application.

MAM 750 - Arts Entrepreneurship I

Credits: 3
Lecture course in discovering and developing entrepreneurial skills in the artist and the arts. Special focus will be placed on developing communication skills, planning strategies, and nurturing the skills and attitudes that enable students to creatively solve problems and identify opportunities. This entrepreneurial perspective is in line with the Mason experience and widely applicable outside the business world, in fields such as politics, education, and the arts. Assigned readings will be augmented and supported by presentations, lectures, and meetings with successful art and non-art entrepreneurs in the region. At mid-term, students will conceive, develop, and present a for-profit or nonprofit business plan strategy, which includes a business model(s), market overview, and management structure. The final project will include adding a revenue model, developing revenue streams, constructing a partnership acquisition strategy, and technical and information technology strategy to the business plan strategy.

Prerequisites
Admission to master of arts in arts management or permission of instructor.

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.

MAM 751 - Arts Entrepreneurship II

Credits: 3
Advanced lecture course in discovering and developing entrepreneurial skills in the artist and the arts. Special focus will be given to developing business financial planning skills, developing a funding strategy, and the marketing and sales of the arts. Assigned readings in the class will be augmented and supported by presentations, lectures, and meetings with successful art and non-art entrepreneurs in the region. At midterm, students will conceive, develop, and present three-year projected cash flows, income statements, accompanying financial assumptions, and funding plans for a for-profit or nonprofit business plan. The final project
will include determining market verticals, targeting those verticals and building a multi-year event-based marketing campaign, which includes schedule and expenses.

**Prerequisites**
Arts Entrepreneurship I or permission of instructor.

**Notes**
The semester concludes with a 15- to 20-minute public presentation of their business financials and marketing campaigns 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

**MAM 760 - Current Issues in Arts Management**

Credits: 3
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 fund raising.

**Prerequisites**
Admission to master of arts in 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

**MAM 780 - Arts Consultancy**

Credits: 3
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.

**Prerequisites**
Admission to CVPA graduate program or special written approval of program director.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**MAM 790 - External Internship**

Credits: 2-4
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).

Prerequisites
Admission to master of arts in arts management, 15-credit standing; or permission of program director.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
6-12

MATH 104 - Trigonometry and Transcendental Functions

Credits: 2
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.

Prerequisites
Satisfactory score on the math placement exam.

Hours of Lecture or Seminar per week
2
Hours of Lab or Studio per week
0

MATH 105 - Precalculus Mathematics

Credits: 3
Reviews mathematics skills essential to studying calculus. Topics include equations, inequalities, absolute values, graphs, functions, exponential and logarithmic functions, and trigonometry.

Prerequisites
High school algebra I, algebra II, and geometry, and specified score on Math Placement Test; or successful completion of self-paced algebra tutorial program offered by Math Literacy Center.

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
3
Hours of Lab or Studio per week
0
MATH 106 - Quantitative Reasoning

Credits: 3
Quantitative skills for real world. Topics include critical thinking, modeling by functions, graphs, growth, scaling, probability, and statistics.

Prerequisites
Specified score on Math Placement Test, or successful completion of self-paced Basic Math Program offered by Math Literacy Center.

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
Functions, limits, derivative, and integral. Applications of differentiation and integration.

Prerequisites
Specified score on Math Placement Test, or successful completion of self-paced Basic Math Program offered by Math Literacy Center.

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 and Statistics

Credits: 3
Elementary set theory, probability, and statistics.

Prerequisites
Specified score on Math Placement Test, or successful completion of self-paced Basic Math Program offered by Math Literacy Center.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0
MATH 111 - Linear Mathematical Modeling

Credits: 3
Matrix algebra, systems of linear equations, Markov chains, difference equations, and data fitting.

Prerequisites
Specified score on Math Placement Test, or successful completion of self-paced Basic Math Program offered by Math Literacy Center.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

MATH 112 - Discrete Mathematics for BSIT

Credits: 3
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.

Prerequisites
Specified score on Math Placement Test, or successful completion of self-paced Algebra Tutorial Program offered through Math Learning Center.

Notes
Intended for BSIT 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

MATH 113 - Analytic Geometry and Calculus I

Credits: 4
Functions, limits, the derivative, maximum and minimum problems, the integral, and transcendental functions.

Prerequisites
Thorough understanding of high school algebra and trigonometry, and specified score on Math Placement Test; or grade of C or better in MATH 105.

Hours of Lecture or Seminar per week
4

Hours of Lab or Studio per week
1

MATH 114 - Analytic Geometry and Calculus II
Methods of integration, conic sections, parametric equations, infinite series, and power series.

**Prerequisites**
Grade of C or better in MATH 113.

**Hours of Lecture or Seminar per week**
4

**Hours of Lab or Studio per week**
1

**MATH 115 - Analytic Geometry and Calculus I (Honors)**

Credits: 4
More challenging version of MATH 113. Functions, limits, the derivative, maximum and minimum problems, the integral, and transcendental functions.

**Prerequisites**
Placement or permission of department.

**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
More challenging version of MATH 114. Methods of integration, conic sections, parametric equations, infinite series, and power series.

**Prerequisites**
Successful completion of MATH 115, or grade of A in MATH 113 and recommendation of MATH 113 instructor.

**Hours of Lecture or Seminar per week**
4

**Hours of Lab or Studio per week**
1

**MATH 125 - Discrete Mathematics I**

Credits: 3
Introduces ideas of discrete mathematics and combinatorial proof techniques including mathematical induction, sets, graphs, trees, recursion, and enumeration.

**Prerequisites**
Specified score on Math Placement Test, or successful completion of self-paced Algebra Tutorial Program offered by Math
MATH 203 - Linear Algebra

Credits: 3
Systems of linear equations, linear independence, linear transformations, inverse of a matrix, determinants, vector spaces, eigenvalues, eigenvectors, and orthogonalization.

Prerequisites
C or better in MATH 114.

MATH 213 - Analytic Geometry and Calculus III

Credits: 3
Partial differentiation, multiple integrals, line and surface integrals, and three-dimensional analytic geometry.

Prerequisites
Grade of C or better in MATH 114.

MATH 214 - Elementary Differential Equations

Credits: 3
First-order ODEs, higher-order ODEs, Laplace transforms, linear systems, nonlinear systems, numerical approximations, and modeling.

Prerequisites
Grade of C or better in MATH 213 or 215.
MATH 215 - Vector Calculus

Credits: 3
Vectors and vectorvalued functions, partial differentiation, multiple integrals, line integrals, surface integrals, and transformation of coordinates.

Prerequisites
Grade of C or better in MATH 113 and 114.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

MATH 216 - Theory of Differential Equations

Credits: 3
First- and second-order equations, existence uniqueness of solutions, systems of differential equations, and phase plane analysis.

Prerequisites
Grade of C or better in MATH 203 and 213 or 215.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

MATH 271 - Mathematics for the Elementary School I

Credits: 3
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 II
Credits: 3
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

Credits: 3
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.

Prerequisites
Grade of C or better in MATH 114.

Notes
Primarily intended for mathematics majors.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

MATH 301 - Number Theory

Credits: 3
Prime numbers, factorization, congruences, and Diophantine equations.

Prerequisites
6 math credits.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

MATH 302 - Foundations of Geometry

Credits: 3
Fundamental concepts of incidence. Axioms of Euclidean geometry and the resulting theory, and axioms and development of non-Euclidean and projective geometry.
Prerequisites
6 math credits.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

MATH 313 - Introduction to Applied Mathematics

Credits: 3
Vector differential calculus, vector integral calculus, Fourier analysis, and complex analysis.

Prerequisites
Grade of C or better in MATH 213 or 215

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

MATH 314 - Introduction to Applied Mathematics

Credits: 3

Prerequisites
Grade of C or better in MATH 214 or 216.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

MATH 315 - Advanced Calculus I

Credits: 3
Number system, functions, sequences, limits, continuity, differentiation, integration, transcendental functions, and infinite series.

Prerequisites
Grade of C or better in MATH 213 or 215 and 290.

Hours of Lecture or Seminar per week
3
MATH 316 - Advanced Calculus II

Credits: 3
Sequences of functions, Taylor series, vectors, functions of several variables, implicit functions, multiple integrals, and surface integrals.

Prerequisites
Grade of C or better in MATH 315.

MATH 321 - Abstract Algebra

Credits: 3
Theory of groups, rings, fields.

Prerequisites
Grade of C or better in MATH 213 or 215 and 290.

MATH 322 - Advanced Linear Algebra

Credits: 3
Abstract vector spaces, linear independence, bases, linear transformations, matrix algebra, inner product, and special topics.

Prerequisites
Grade of C or better in MATH 203 and 290.

MATH 325 - Discrete Mathematics II
Credits: 3
Advanced counting, binomial identities, generating functions, advanced recurrence, inclusion-exclusion, and network flows.

Prerequisites
Grade of C or better in MATH 125.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

MATH 351 - Probability

Credits: 3
Random variables, probability functions, special distributions, and limit theorems.

Prerequisites
Grade of C or better in MATH 213 or 215.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

MATH 352 - Statistics

Credits: 3
Estimation, decision theory, testing hypothesis, correlation, linear models, and design.

Prerequisites
Grade of C or better in MATH 351.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

MATH 382 - Introduction to Stochastic Processes

Credits: 3
General notion of stochastic processes, finite and infinite Markov chains, discrete and continuous Markov processes, stationary processes, random walk problems, birth and death processes, waiting line and serving problems, and Brownian motion.

Prerequisites
MATH 351.

Hours of Lecture or Seminar per week
MATH 400 - History of Math

Credits: 3
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.

Prerequisites
Completion or concurrent enrollment in all other required general education courses, and completion of MATH 290.

Notes
Credits may not be used toward "upper division" math hours required of math majors.

MATH 405 - Honors Thesis in Mathematics I

Credits: 3
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.

Prerequisites
Two MATH courses at the 300 or higher level (excluding MATH 400), at least one of which has MATH 290 as a prerequisite, and admission to the Mathematics Honors Program.

MATH 406 - Honors Thesis in Mathematics II

Credits: 3
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.

Prerequisites
MATH 405
MATH 411 - Functions of a Complex Variable

Credits: 3
Analytic functions, contour integration, residues, and applications to such topics as integral transforms, generalized functions, and boundary value problems.

Prerequisites
Grade of C or better in MATH 214 or 216.

MATH 413 - Modern Applied Mathematics I

Credits: 3

Prerequisites
Grade of C or better in MATH 203 and 214 or 216.

MATH 414 - Modern Applied Mathematics II

Credits: 3
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.

Prerequisites
Grade of C or better in MATH 413.
MATH 431 - Topology

Credits: 3
Metric spaces, topological spaces, compactness, and connectedness.

Prerequisites
C or better in MATH 315.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

MATH 441 - Deterministic Operations Research

Credits: 3

Prerequisites
Grade of C or better in MATH 203

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

MATH 442 - Stochastic Operations Research

Credits: 3

Prerequisites
Grade of C or better in MATH 351.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

MATH 446 - Numerical Analysis I
Credits: 3
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.

Prerequisites
Grade of C or better in MATH 203 and CS 112.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

**MATH 447 - Numerical Analysis II**

Credits: 3

Prerequisites
Grade of C or better in Math 214 or 216 and 446.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

**MATH 478 - Introduction to Partial Differential Equations with Numerical Methods**

Credits: 3
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.

Prerequisites
C or better in MATH 203 and 214 or 216.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

**MATH 491 - Reading and Problems**

Credits: 1-3
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
For mathematical sciences majors only. Independent study in math.

Notes
Must be arranged with instructor before registering.

MATH 493 - Topics in Applicable Mathematics

Credits: 3
Topics that have been successfully used in applications of mathematics.

Prerequisites
6 credits of math at or above 310 level.

Notes
Subject determined by instructor.

MATH 494 - Topics in Pure Mathematics

Credits: 3
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.

Prerequisites
6 credits of math at or above 310 level.

Notes
Subject determined by instructor.
MATH 551 - Regression and Time Series

Credits: 3

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.

Prerequisites
MATH 352, STAT 652, SOA Exam P, or permission of instructor.

MATH 554 - Financial Mathematics

Credits: 3
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.

Prerequisites
MATH 113

Corequisite
MATH 114

MATH 555 - Actuarial Modeling I
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.

**Prerequisites**
MATH 554 and either MATH 351 or STAT 344.

**MATH 556 - Actuarial Modeling II**

Credits: 3
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.

**Prerequisites**
MATH 554 and either MATH 351 or STAT 344.

**MATH 600 - Special Topics in Mathematics**

Credits: 1-6
Mathematical workshops, special courses, or other projects.

**MATH 601 - Analysis I for Teachers**

Credits: 3
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.

**Prerequisites**
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

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**MATH 602 - Analysis II for Teachers**

Credits: 3
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.

**Prerequisites**
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

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**MATH 604 - Geometry for Teachers**

Credits: 3
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.

**Prerequisites**
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**

MATH 605 - Discrete/Finite Mathematics for Teachers

Credits: 3
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.

Prerequisites
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.

MATH 607 - Algebraic Structure for Teachers

Credits: 3
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.

Prerequisites
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.

MATH 608 - Problem Solving in Mathematics

Credits: 3
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.
Prerequisites
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 619 - Topics in Mathematical Logic

Credits: 3
Special topics in foundations of mathematics not included in regular mathematics curriculum. May be repeated for credit.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

MATH 621 - Algebra I

Credits: 3
Groups, linear algebra, and matrix groups.

Prerequisites
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
Euclidean space, geometry of k-dimensional planes, the affine structure of Euclidean space, rigid motions and similarities, parallelepipeds and volumes, convex polytopes, quadric surfaces, and additional topics by instructor’s choice.

Prerequisites
MATH 290 or MATH 322 or equivalent.

Hours of Lecture or Seminar per week
MATH 625 - Numerical Linear Algebra

Credits: 3
Cross-Listed with CSI 740

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.

Prerequisites
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

Credits: 3
Special topics in pure or applied algebra not covered in regular algebra sequence. May be repeated for credit.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

MATH 631 - Topology I: Topology of Metric Spaces

Credits: 3
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.

Prerequisites
MATH 315 or equivalent.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0
MATH 641 - Combinatorics and Graph Theory

Credits: 3
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.

Prerequisites
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
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 geometry.

Prerequisites
MATH 203 and 290, or equivalent.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

MATH 653 - Actuarial Modeling III

Credits: 3
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.

Prerequisites
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
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.

**Prerequisites**
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
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.

**Prerequisites**
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
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
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**
MATH 673 - Dynamical Systems

Credits: 3
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.

Prerequisites
Elementary courses in linear algebra and differential equations.

MATH 674 - Stochastic Differential Equations

Credits: 3
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.

Prerequisites
MATH 214 and 351

MATH 675 - Linear Analysis I

Credits: 3
Metric spaces, normed linear spaces, completeness, compactness, continuous (bounded) linear transformations, Banach spaces, Hilbert spaces, and orthogonal series.

Prerequisites
MATH 315 or equivalent.

MATH 677 - Ordinary Differential Equations

Credits: 3
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.

Prerequisites
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
Physical examples, characteristics, boundary value problems, integral transforms, and other topics, such as variational, perturbation, and asymptotic methods.

Prerequisites
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

Credits: 3
Special topics not covered in regular analysis sequence. May be repeated for credit.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

MATH 680 - Industrial Mathematics

Credits: 3
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.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

MATH 682 - Linear Programming

Credits: 3
Cross-Listed with OR 641

Takes in-depth look at simplex method. Includes computational enhancements such as revised simplex method, sparse-matrix techniques, bounded variables and generalized upper bounds, and large-scale decomposition methods. Also includes computational complexity of simplex algorithm, and Khachian and Karmarkar algorithms.

Prerequisites
OR 541, or 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

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.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

MATH 685 - Numerical Analysis

Credits: 3
Cross-Listed with CSI 700

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.
Prerequisites
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
Finite difference methods for initial value problems, two-point boundary value problems, Poisson equation, heat equation, and first-order partial differential equations.

Prerequisites
MATH 214 and MATH 446 or 685.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

MATH 687 - Variational Methods

Credits: 3
Weak formulation of partial differential equations, energy principles, Galerkin approximations, and finite element methods. Includes review and development of necessary analysis.

Prerequisites
MATH 446 or 685, and elementary differential equations course.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

MATH 689 - Topics in Applied Mathematics

Credits: 3
Special topics in applied mathematics not covered in the regular applied mathematics sequence. May be repeated for credit.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0
MATH 697 - Independent Reading and Research

Credits: 1-6
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.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
0

MATH 721 - Algebra II

Credits: 3
Rings, fields, and Galois theory.

Prerequisites
MATH 621.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

MATH 722 - Algebraic Topology

Credits: 3
Covers simplices and simplicial complexes, cycles and boundaries, simplicial homology, homological algebra, homotopy and the fundamental group, cohomology.

Prerequisites
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
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.

**Prerequisites**
MATH 321 or equivalent.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

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**MATH 724 - Commutative Algebra**

Credits: 3
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.

**Prerequisites**
MATH 621.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

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**MATH 732 - Topology II: Set-Theoretic Topology**

Credits: 3
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.

**Prerequisites**
MATH 631 or equivalent.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

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**MATH 739 - Topics in Differential Geometry and Topology**

Credits: 3
Topics include geometry of curves and surfaces, curvature, isometries, the Gauss-Bonet theorem, geodesics, differential forms, manifolds, smooth maps, vector fields, the Euler characteristic, integration on manifolds, de Rham cohomology.
Prerequisites
MATH 631 or equivalent.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

MATH 762 - Complex Analysis II

Credits: 3
Harmonic functions, generalizations of the maximum principle, entire and meromorphic functions, analytic continuation, and the Riemann mapping theorem.

Prerequisites
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
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.

Prerequisites
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
Cross-Listed with CSI 746

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.

Prerequisites
MATH 315 or equivalent.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**MATH 776 - Linear Analysis II**

Credits: 3
Lebesque 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.

**Prerequisites**
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
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.

**Prerequisites**
Permission of instructor. Different backgrounds may be appropriate, but generally, a student is expected to be an upper level graduate student who has already taken graduate courses including differential equations and dynamical systems.

**Hours of Lecture or Seminar per week**
3
**Hours of Lab or Studio per week**
0

**MATH 784 - Nonlinear Functional Analysis**

Credits: 3
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.

**Prerequisites**
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
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.

Prerequisites
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
Mandatory for all PhD students. Weekly seminar graded on presentations and attendance. Faculty presentations on potential thesis topics and presentations by students.

Prerequisites
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 - Thesis

Credits: 1-6
Original or compilatory work evaluated by committee of three faculty members.
MATH 800 - Studies for the Doctor of Philosophy in Education

Credits: variable
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.

Prerequisites
Admission to PhD in education program to study in mathematical sciences.

MATH 998 - PhD Thesis Proposal

Credits: 1-12
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.

Prerequisites
Passing grade on preliminary exams.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
0
Grading
S/IP

MATH 999 - PhD Thesis Credits

Credits: 1-12
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.

Prerequisites
Advancement to doctoral candidacy.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
0
Grading
S/IP
MBA 603 - Managerial Economics and Decisions of the Firm

Credits: 3
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.

Prerequisites
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 and spring

MBA 612 - Managing Costs and Evaluating Performance

Credits: 1.5
Examines impact of cost and cost allocation on performance and evaluation.

Prerequisites
Admission to MBA program and MBA 613.

Hours of Lecture or Seminar per week
1.5

Hours of Lab or Studio per week
0

When Offered
Spring and summer

MBA 613 - Financial Reporting and Decision Making

Credits: 3
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.

Prerequisites
Admission to MBA program.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

When Offered
Fall and spring
MBA 623 - Marketing Management

Credits: 3
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.

Prerequisites
Admission to MBA program.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

When Offered
Fall and spring

MBA 633 - Statistics for Business Decision Making

Credits: 3
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.

Prerequisites
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 and spring

MBA 638 - Operations Management

Credits: 3
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.

Prerequisites
Admission to MBA or MSA program.

Hours of Lecture or Seminar per week
MBA 643 - Managerial Finance

Credits: 3
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.

Prerequisites
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 and spring

MBA 653 - Organizational Behavior

Credits: 3
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.

Prerequisites
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 and spring

MBA 673 - Legal Environment for Management

Credits: 1.5
Examines the managerial impact of the law upon decision-making processes in business organizations. Lectures as well as discussions of judicial opinions and readings.

Prerequisites
Admission to MBA program.

Hours of Lecture or Seminar per week
**MBA 678 - Strategy and Organizational Leadership**

Credits: 3  
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.

**Prerequisites**
Admission to MBA program.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**When Offered**
Fall and spring

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**MBA 701 - Business Analysis and Valuation**

Credits: 3
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.

**Prerequisites**
Completion of MBA or MSA 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 702 - Corporate Financial Policy**

Credits: 3
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.

**Prerequisites**
Prerequisite completion of MBA core requirements, or permission of instructor.
MBA 703 - Financial Markets

Credits: 3
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.

Prerequisites
Completion of MBA core requirements, or permission of instructor.

MBA 704 - Risk Management and Financial Innovation

Credits: 3
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.

Prerequisites
Completion of MBA core requirements, or permission of instructor.

MBA 705 - Venture Capital and Private Finance

Credits: 3
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.

Prerequisites
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
Focuses on analyzing equity securities and debt instruments given implications of efficient market hypothesis and modern capital market theory.

**Prerequisites**
Completion of MBA core requirements, or permission of instructor.

### MBA 708 - Taxes and Business

Credits: 3
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.

**Prerequisites**
Completion of MBA core requirements, or permission of instructor.

### MBA 711 - Entrepreneurship

Credits: 3
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.

**Prerequisites**
Completion of MBA core requirements, or permission of instructor.
MBA 712 - Project Management

Credits: 3
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.

Prerequisites
Completion of MBA core requirements, or permission of instructor.

MBA 713 - Human Resource Management

Credits: 3
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 (recruiting/interviewing), firing, rewarding, compensating, managing performance, global HR issues, and security and health.

Prerequisites
Completion of MBA core requirements, or permission of instructor.

MBA 714 - Managing Growth of Small Businesses

Credits: 3
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.

**Prerequisites**
Completion of MBA core; MBA 711 recommended.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**When Offered**
Spring

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**MBA 715 - Advanced Project and Program Management**

Credits: 3
Examines advanced topics in project and program management with specific attention to issues and skills that managers need to effectively manage multiple projects and programs. Topics include project selection, multiple project resource allocation, and organization of project office.

**Prerequisites**
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 716 - International Business Strategy**

Credits: 3
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.

**Prerequisites/Corequisites**
Prerequisites or corequisites: completion of MBA core requirements.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**When Offered**
Summer

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**MBA 717 - International Finance**
Credits: 3
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.

Prerequisites
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
Summer

MBA 718 - International Marketing

Credits: 3
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.

Prerequisites
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 719 - Entrepreneurship Laboratory

Credits: 1.5
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.

Prerequisites
Completion of MBA core requirements and permission of instructor.

Notes
May be repeated three times in different semesters.

Hours of Lecture or Seminar per week
0

Hours of Lab or Studio per week
1.5
MBA 721 - Marketing Decision Systems

Credits: 3
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.

Prerequisites
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
Examines behavioral science concepts to understand and predict customer decision making, including demographics, psychographics, attitude formation and change, perception, and learning. Emphasizes applications of product and service strategies, focusing on customer segmentation, satisfaction, and loyalty.

Prerequisites
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 723 - Supply Chain Management

Credits: 3
Examines logistics of supply chain systems, including inventory management, distribution channels, and information systems. Emphasizes strategic alliances and international issues.

Prerequisites
Completion of MBA core requirements, or permission of instructor.

Hours of Lecture or Seminar per week
MBA 724 - Marketing Communications

Credits: 3
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.

Prerequisites
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 725 - Leadership

Credits: 3
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.

Prerequisites
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 726 - Negotiations

Credits: 3
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.
**MBA 731 - Business Systems Development**

Credits: 3
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.

**Prerequisites**
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 732 - Knowledge Management**

Credits: 3
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.

**Prerequisites**
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**
Summer

**MBA 733 - Business Data Communications**

Credits: 3
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.

**Prerequisites**
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

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**MBA 734 - Electronic Commerce and E-Business**

Credits: 3

**Prerequisites**
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 735 - Systems Thinking for Business Performance**

Credits: 3
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.

**Prerequisites**
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**
Summer

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**MBA 737 - Information Technology Governance and Policy**
Credits: 3
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.

Prerequisites
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 738 - Business Intelligence and Data Management

Credits: 3

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.
MBA 738 may be used toward the Spatial Business Intelligence Graduate Certificate only if not used toward the MBA degree.

Prerequisites
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
Cross-Listed with ACCT 741

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.

Prerequisites
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
Cross-Listed with ACCT 742

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.

Prerequisites
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 743 - Corporate Financial Reporting

Credits: 3
Cross-Listed with ACCT 743

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.

Prerequisites
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
Summer

MBA 744 - Fraud Deterrence and Detection

Credits: 3
Cross-Listed with ACCT 744

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.

Prerequisites
Admission to MSA or MBA program, or permission of program director.

Hours of Lecture or Seminar per week
MBA 745 - International Financial Reporting

Credits: 3
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.

Prerequisites
Admission to MBA program and completion of core curriculum

Hours of Lecture or Seminar per week
3

MBA 746 - Real Estate Analysis and Valuation

Credits: 3
Cross-Listed with GSOM 746
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.

Prerequisites
Completion of MBA core requirements, or permission of instructor.

Hours of Lecture or Seminar per week
3

MBA 747 - Real Estate Finance

Credits: 3
Cross-Listed with GSOM 747
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.

Prerequisites
Completion of MBA core requirements, or permission of instructor.

Hours of Lecture or Seminar per week
3
MBA 748 - Real Estate Investment

Credits: 3
Cross-Listed with GSOM 748

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.

Prerequisites
Completion of MBA core requirements, or permission of instructor.

Hours of Lecture or Seminar per week
3

MBA 752 - Turning Ideas into Successful Companies

Credits: 3
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.

Prerequisites
Completion of MBA core requirements and MBA 711 (for MBA students), or permission of the instructor.

Hours of Lecture or Seminar per week
3

When Offered
Spring

MBA 796 - Directed Studies in Business Administration

Credits: 1-3
Approval by faculty member and MBA program director required prior to registration. Studies specialized topics in business administration not otherwise available in curriculum.

Prerequisites
Completion of MBA core requirements, or permission of instructor.

Notes
May be repeated for up to 3 credits.
MBA 798 - Global Business Perspectives

Credits: 3
Applies MBA core courses to global business enterprise through site visits to facilities located outside the United States.

Prerequisites
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 and summer

MBA 799 - Special Topics in Business

Credits: 1-3
Sections established as necessary to focus on various topical issues that emerge in practice of business administration.

Prerequisites
Completion of MBA core requirements, or permission of instructor.

Hours of Lecture or Seminar per week
1-3
Hours of Lab or Studio per week
0

MGMT 301 - Managing People and Organizations

Credits: 3
Explores how individuals behave in workplace, and how group and organizational structures affect individual behavior. Topics include individual differences, groups and teams, managing conflict, negotiation, stress, diversity, influence, leadership, and motivational theories and techniques. Half lecture, half lab; format provides opportunities to discuss and apply concepts throughout semester. Lecture, recitation format; requires attendance in weekly lecture and weekly recitation.

Prerequisites
Sophomore standing.

Hours of Lecture or Seminar per week
3
MGMT 312 - Principles and Practices of Management

Credits: 3
Builds on fundamental theories and concepts learned in MGMT 301 by examining nature of managerial work under range of business models and under rapidly changing business conditions. Managerial functions and activities such as planning, strategizing, organizing, controlling, and directing examined in depth and in context of current organizational examples and scenarios.

Prerequisites
C or higher in MGMT 301 and degree status.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

MGMT 321 - Introduction to Human Resource Management

Credits: 3
Human capital is the most important asset to most firms. Human resources field examines what can or should be done to make workers more productive and satisfied. 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.

Prerequisites
C or higher in MGMT 301 and degree status.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

MGMT 412 - Diversity in Organizations

Credits: 3
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 others' perspectives, and ability to work well with people who differ from themselves.

Prerequisites
C or higher in MGMT 301 and degree status.

Hours of Lecture or Seminar per week
MGMT 413 - Organizational Development and Management Consulting

Credits: 3
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.

Prerequisites
C or higher in MGMT 301; degree status.

MGMT 421 - Advanced Human Resource Management

Credits: 3
Builds on MGMT 321 by using case-based approach to deepen understanding of HRM best practices. Students conduct projects requiring application of important strategic human resource processes. In addition, advanced topics not thoroughly covered in MGMT 321 are discussed, such as international HRM. Relevant for management majors, particularly those seeking human resource management career. Helps prepare for Professional in Human Resources certification exam, which is affiliated with Society for Human Resource Management.

Prerequisites
C or higher in MGMT 301 and 321, and degree status.

MGMT 431 - Employee Relations

Credits: 3
Focuses on employee relations issues from historical and current perspectives; for management majors interested in pursuing HRM career.

Prerequisites
C or higher in MGMT 301 and BULE 302; degree status.
MGMT 451 - New Venture Creation

Credits: 3
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.

Prerequisites
C or higher in MGMT 301 and degree status.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

MGMT 461 - Cross Cultural and Global Management

Credits: 3
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.

Prerequisites
C or higher in MGMT 301, and degree status.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

MGMT 462 - Honors Seminar in Management

Credits: 3
Topic and format vary. In-depth study of topic of interest to managers and organizations.

Prerequisites
Invitation by professor.

Notes
Enrollment limited and competitive.
MGMT 463 - Negotiations in Organizations

Credits: 3
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.

Prerequisites
C or higher in MGMT 301 and degree status.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

MGMT 464 - Teamwork and Interpersonal Skills

Credits: 3
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.

Prerequisites
C or higher in MGMT 301 and degree status.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

MGMT 471 - Competitive Strategy

Credits: 3
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.

Prerequisites
C or higher in MGMT 301 and degree status.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

**MGMT 491 - Current Topics in Management**

Credits: 3
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.

**Prerequisites**
C or higher in MGMT 312 and degree status.

**Hours of Lecture or Seminar per week**
3
**Hours of Lab or Studio per week**
0

**MGMT 499 - Independent Study**

Credits: 1-3
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.

**Prerequisites**
Management majors with at least 9 credits of management major courses.

**Notes**
Written report required.

**Hours of Lecture or Seminar per week**
0
**Hours of Lab or Studio per week**
0

**MIS 102 - Spreadsheet Applications for Business**

Credits: 1
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**
0
**Hours of Lab or Studio per week**
1
**Grading**
**MIS 301 - Introduction to Business Information Systems**

Credits: 3  
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.

**Prerequisites**  
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.

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**MIS 302 - Introduction to Programming for Business Applications**

Credits: 3  
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.

**Notes**  
IT 108 highly recommended but not required.

**Hours of Lecture or Seminar per week**  
3

**Hours of Lab or Studio per week**  
0

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**MIS 310 - Database Management Systems**

Credits: 3  
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.
**MIS 320 - Networks and Security**

Credits: 3  
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.

**Prerequisites**
C or higher in MIS 301, degree status.

**Notes**
The course also includes lab work and exercises.

**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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**MIS 330 - Systems Analysis and Design**

Credits: 3  
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.

**Prerequisites**
C or higher in MIS 301 and MIS 310, degree status, programming course recommended.

**Notes**
Requires team project.

**Hours of Lecture or Seminar per week**
3
MIS 411 - Management and Control of Information Systems

Credits: 3
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.

Prerequisites
C or higher in MIS 301, degree status.

MIS 412 - E-Business Systems Development

Credits: 3
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.

Prerequisites
C or higher in MIS 301, degree status.

Notes
Requires team project and computer lab.

MIS 430 - Data Warehousing and Data Mining

Credits: 3
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.
Prerequisites
C or higher in MIS 301 and MIS 310, degree status.

Notes
Term project required.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

MIS 435 - Knowledge Management

Credits: 3
Focuses on new trends on how knowledge management works for organizations, best strategy for such transition, and what are knowledge management elements.

Prerequisites
C or higher in MIS 301 and MIS 310, degree status.

MIS 440 - E-Commerce Business Models and Applications

Credits: 3
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.

Prerequisites
C or higher in MIS 301 and MIS 310, degree status.

Notes
Requires a term project.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

MIS 450 - Internet Architecture and Industry
Credits: 3
Overview of elements of Internet architecture. Analyzes economic and regulatory issues. Internet technology and industry trends. Includes lab sessions and exercises.

Prerequisites
C or higher in MIS 301 and MIS 310, degree status.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

MIS 462 - Honors Seminar in Management Information Systems

Credits: 3
Topic and format vary. In-depth study of a topic in the area of information technology management. Enrollment limited and competitive.

Prerequisites
Senior standing, ISOM major, minimum GPA requirement.

MIS 491 - Seminar in Management Information Systems

Credits: 3
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.

Notes
C or higher MIS 301, degree status.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

MIS 499 - Independent Study in Management Information Systems

Credits: 1-3
Research and analysis of selected problems or topics in information resource management.

Notes
C or higher MIS 301, degree status. Must be arranged with instructor and approved in writing by associate dean for undergraduate programs before registration.

Hours of Lecture or Seminar per week
3
MKTG 301 - Principles of Marketing

Credits: 3
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 and sustainability decision making in a global economy are also emphasized.

Prerequisites
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
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.

Prerequisites
C or higher in MKTG 301, degree status.

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
Marketing strategy implications of concepts and propositions that compose consumer decision processes. Emphasizes demographics, lifestyle, situation, and information processing. Lecture and case analysis.

Prerequisites
C or higher in MKTG 301, degree status.

Hours of Lecture or Seminar per week
MKTG 313 - Integrated Marketing Communications

Credits: 3
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.

Prerequisites
C or higher in MKTG 301, degree status.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

When Offered
Fall, Spring, Summer.

MKTG 315 - Internet Marketing

Credits: 3
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.

Prerequisites
C or higher in MKTG 301 and MIS 301, degree status.

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
Comprehensive view of retailing as it relates to overall marketing processes. Emphasizes retail decision alternatives used when formulating retail strategies, particularly Internet.
Prerequisites
C or higher in MKTG 301, degree status.

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
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.

Prerequisites
C or higher in MKTG 301, degree status.

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
Study of concepts, theories, and principles underlying marketing research process. Focuses on development and evaluation of research designs for gathering marketing information.

Prerequisites
C or higher in OM 210 and MKTG 301, degree status.

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
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.

**Prerequisites**
C or higher in MKTG 301, degree status.

**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
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.

**Prerequisites**
C or higher in MKTG 301, degree status.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**When Offered**
Fall.

**MKTG 471 - Marketing Management**

Credits: 3
Emphasizes managerial aspects of marketing, including developing marketing strategies and plans, and integrating specific elements of marketing process. Emphasizes case analysis.

**Prerequisites**
Senior standing; C or higher in MKTG 301, 312 and 351; degree status.

**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**
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.

**Prerequisites**
C or higher in MKTG 301, degree status.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**When Offered**
Spring.

### MKTG 491 - Special Topics in Marketing

Credits: 3
In-depth treatment in seminar format of contemporary topics in marketing. Culminates in preparation of substantial paper and oral presentation.

**Prerequisites**
C or higher in MKTG 301, 9 credits of marketing, degree status.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**When Offered**
Spring.

### MKTG 499 - Independent Study

Credits: 1-3
Primary research proposal in marketing area. Requires prior approval from instructor and associate dean for undergraduate programs.

**Prerequisites**
90 credits (senior class standing) and a minimum of 24 credits of business courses, including principles of marketing, finance, and management.

**Hours of Lecture or Seminar per week**
0

**Hours of Lab or Studio per week**
0

**When Offered**
Fall, Spring, Summer.
MLSC 100 - Leadership Skills I

Credits: 0
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: 0
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 - Leadership Skills III

Credits: 0
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.

Prerequisites
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: 0
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.

Prerequisites
MLSC 200
MLSC 201 (LAB) - Leadership Laboratory (Lead Lab)

Credits: 0
Students enrolling in any MLSC class for commissioning credit must enroll in this lab section.

Notes
Meets as a combined unit on Tuesdays, 1:30-4:15 p.m. Trains students on a variety of practical military tasks, from drill and ceremonies to small unit tactics. Upper-class cadets lead training as part of staff leadership experience. Includes field training exercises (FTX) each semester; physical training sessions are conducted every Monday, Wednesday, and Friday, 7-8 a.m., generally at the Field House. A professor of military science can authorize waivers to LAB 201 enrollment in certain circumstances, such as scheduling conflicts.

MLSC 300 - Applied Leadership I

Credits: 1
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.

Prerequisites
MLSC 100, 101, 200, and 201; and credit or veteran status with approval from military science professor

MLSC 301 - Applied Leadership II

Credits: 0
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.
Prerequisites
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
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.

Prerequisites
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
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.

Prerequisites
MLSC 400, 300, or 301

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
2

MNPE 700 - The New Professionalism: Theory and Practice

Credits: 3
Experientially explores personal philosophical and pedagogical assumptions, including ethical relationship between educators and children, ethical accountability and responsibility, ethos of institutions, professionals role in sustaining ethical standards, and
how these challenges guide our lives as citizens in a democracy.

**MNPE 702 - The New Professional as a Reflective Practitioner**

Credits: 3
Examines central problems of epistemology, what is meant by "ways of knowing" and "reflective practitioner," and what they imply for professional learning. Special attention to developing skills for reflective practice through journals, narrative autobiography, and imaginative literature; and to considering how personal and professional identity is influenced by personal intentions and commitments to learning and schooling.

**MNPE 703 - Technology and Learning in the New Professions**

Credits: 3
Uses various technological modes to sustain and enhance learning community. By learning and using technology such as e-mail, electronic conferences, and Internet, teachers further develop computer literacy and develop sharpened critiques regarding possibilities and concerns brought about by using technology in learning environments.

**MNPE 704 - Research Methodologies in the New Professionalism**

Credits: 3
Introduces qualitative approach to research as individual school-based projects are undertaken. Draws on "action research," which starts with participants describing reality as they see it, reflecting on it, and deriving theories and action strategies immediately applicable to concrete situations. Emphasizes understanding and using various research methodologies as innovative approaches to teaching and learning are developed.

**Corequisite**
EDUC 597.
MNPS 700 - The New Professionalism: Theory and Practice

Credits: 3
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
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
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
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**
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

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**MNPS 720 - Learning Community**

Credits: 3
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.

**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

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**MSBM 603 - Managerial Economics and Decisions of the Firm**

Credits: 3
Provides fundamental understanding of how microeconomics concepts are usefully applied to managerial decision-making. Fully explores principles of microeconomic theory, including market supply and demand, production and cost functions, industry structure, and product and resource pricing.

**Prerequisites**
Admission to MSBM program.

**Hours of Lecture or Seminar per week**
3
MSBM 613 - Financial Reporting and Decision Making

Credits: 3
Foundation course focusing on economics and analysis of business transactions and related financial reporting issues. Topics include introduction to accounting framework in financial reporting; and analysis of financial statements, economic events' impact on financial reports, and impact of accounting method choices on financial reports.

Prerequisites
Admission to MSBM program.

MSBM 623 - Marketing Management

Credits: 3
Develops abilities to make marketing decisions in a wide variety of bioscience organizational and competitive situations. Emphasizes technology to aid in analysis, decision making, and communication of decisions to relevant stakeholders.

Prerequisites
Admission to MSBM program.

Notes
Case studies, team work, and projects.

MSBM 643 - Managerial Finance in Bioscience Management

Credits: 3
Introduces theory and practice of finance within corporations as applied to life sciences organization and industry. Topics include intertemporal choice, valuation, capital budgeting, capital structure, working capital management, and risk/return analysis.

Prerequisites
Admission to MSBM program.
MSBM 650 - Legal and Ethical Aspects of Bioscience Management

Credits: 3

Introduces contemporary legal and ethical doctrines as applied to the life sciences organization and industry, and examines how they can be applied to guide and enhance the decision-making processes of managers in a global economy. Discusses intellectual property issues.

Prerequisites
Admission to MSBM program, or permission of instructor.

Notes
Lecture, class discussion, cases, and projects.

MSBM 653 - Organizational Behavior and Human Resource Management

Credits: 3

Emphasizes development of conceptual tools for understanding and analyzing individual and group behavior in bioscience organizations and organizational processes. Considerable focus on developing relevant skills for working in groups and teams.

Prerequisites
Admission to MSBM program.

Notes
Lectures, discussions, case analyses, and in-class exercises.

MSBM 703 - Best Practices in R&D Management

Credits: 3

Deals with management of R&D in corporations and outside funding agencies. Management of R&D project portfolio; third and
fourth generation R&D management practices; and climate for R&D funding, including government policy from perspective of firms and institutions receiving funding, and the agencies funding projects. Studies corporate, institutional, and governmental perspectives.

Prerequisites
Admission to MSBM program, or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

MSBM 712 - Project and Cost Management

Credits: 3
Focuses on project scheduling, time-cost trade-offs, budgeting, cost control, and project monitoring. Emphasizes cost-management aspects of projects in bioscience industries. Uses software, case studies.

Prerequisites
Completion of bioscience management core requirements, or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

MSBM 720 - Analysis of the Bioscience Industries

Credits: 3
Develops knowledge of status of bioscience and bioinformatics industry and its companies and segments. Students analyze bioscience companies using Porter's Five Forces Model, examine industry segments, and create electronic database with their findings and analysis.

Prerequisites
Admission to MSBM program, or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

MSBM 735 - Bioscience Management Capstone Project

Credits: 3
Teams undertake strategic evaluation and plan for bioscience-driven business initiatives. Teams present their results, including 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 theory, finance, and bioscience product research
and development; and implementation plan using theories of communication and change management, to include business case and business plan.

**Prerequisites**
Admission to MSBM program, or permission of instructor.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**MSBM 745 - Bioscience Product Development and Risk Management**

Credits: 3
Explores best practices in product development in the life sciences (bioinformatics, bioscience, genomics, biotechnology, and pharmaceutical). Students analyze practices in terms of gaining competitive advantage in an industry where new technologies and economic models for products are constantly being developed. Life science projects and product development efforts categorized and analyzed to develop and maintain the most favorable project or product asset portfolio to successfully carry out business goals and strategies. Analyzes effect of bioscience project investments on organization's financial worth and performance, and bioscience industry segments and companies from perspective of choosing appropriate partnerships.

**Prerequisites**
Admission to MSBM program, or permission of instructor.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**MSBM 750 - Global Aspects of Bioscience Management**

Credits: 3
Students spend a week in an international residency under faculty leadership. Primary focus is dealing with globalization of the life science industries, international markets for life science products and global developments in R&D, virtual global organization, and project management across cultures. Features corporate site visits, and presentations by professors from international universities and practitioners.

**Prerequisites**
Admission to MSBM program, or permission of instructor.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**MSOM 300 - Managing Financial Resources**
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.

**Prerequisites**
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

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**MSOM 301 - Managing People and Organizations**

Credits: 3
Introduces key issues in management, organizational behavior, and human resource management. Special attention to best practices used by effective managers.

**Prerequisites**
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

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**MSOM 302 - Managing Information in a Global Environment**

Credits: 3
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.

**Prerequisites**
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
MSOM 303 - Marketing in a Global Economy

Credits: 3
Presents 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.

Prerequisites
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

MSOM 304 - Entrepreneurship: Starting and Managing a New Enterprise

Credits: 3
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.

Prerequisites
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

MSOM 305 - Managing in a Global Economy

Credits: 3
Multidisciplinary approach to global economy from viewpoint of managing international business. Introduces unique aspects of managing in global economy including theory and political economy of international trade and foreign direct investment, global monetary system, and strategy of international business.

Prerequisites
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

**MSOM 306 - Managing Projects and Operations**

Credits: 3
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.

**Prerequisites**
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.

**MTCH 200 - Introduction to Medical Technology**

Credits: 1
Introduction to the profession of medical technology.

**Hours of Lecture or Seminar per week**
1

**Hours of Lab or Studio per week**
0

**MTCH 401 - Orientation to the Problems and Practices of the Clinical Laboratory**

Credits: 1-2
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.

**Hours of Lecture or Seminar per week**
0
MTCH 402 - Clinical Hematology and Coagulation

Credits: 1-8
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
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
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
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
0
Hours of Lab or Studio per week
0

MTCH 406 - Clinical Chemistry

Credits: 1-10
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
0
Hours of Lab or Studio per week
0

MUSI 100 - Fundamentals of Music

Credits: 3
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.

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
F, S

MUSI 101 - Introduction to Classical Music
Credits: 3
Introduces art-music tradition of West. Techniques for expanding listening skills developed through study of musical elements, styles, and selected masterworks of musical literature.

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
F, S

MUSI 102 - Popular Music in America

Credits: 3
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.

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
F, S

MUSI 103 - Musics of the World

Credits: 3
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.

Notes
For non-music majors only.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0
When Offered
F, S

MUSI 104 - Introduction to Twentieth-Century Music
MUSI 103 - Survey of 20th-Century Music

Credits: 3
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
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
Historical, analytical, and aural survey of jazz from inception to present day. Looks at trends resulting from synthesis of jazz with other musical idioms.

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
F, S

MUSI 113 - Sight Singing and Ear Training I

Credits: 2
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.
Prerequisites
MUSI 115 and 171, or permission of instructor

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0
When Offered
F, S

MUSI 114 - Sight Singing and Ear Training II

Credits: 2
Continuation of MUSI 113. Alto and tenor clefs, modulation, various modes, and melodic and harmonic dictation.

Prerequisites
MUSI 113, or permission of instructor

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0
When Offered
F, S

MUSI 115 - Theory I

Credits: 3
Music notation, scales, key signatures, intervals, chords, cadences, and figured bass.

Prerequisites
Students must read music, pass fundamentals of music test administered during first week of classes, and have some proficiency on musical instrument or in voice.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0
When Offered
F

MUSI 116 - Theory II

Credits: 3
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.
Prerequisites
MUSI 115, or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0
When Offered
S

MUSI 171 - Keyboard Skills I

Credits: 1
Study of piano keyboard as it relates to various clefs in music. Emphasis on solution of basic stylistic and technical problems.

Prerequisites
Non-music majors must have permission of instructor.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
3
When Offered
F

MUSI 172 - Keyboard Skills II

Credits: 1
Study of piano keyboard as it relates to intermediate song and combined in various music forms.

Prerequisites
MUSI 171.

Notes
Nonmusic majors must have permission of instructor.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
3
When Offered
S

MUSI 213 - Sight Singing and Ear Training III

Credits: 2
Continuation of Music 114. Emphasizes modulation, chromatic and nontonal melodies, various modes, melodic and harmonic
dictation, c clefs, and improvisation.

**Prerequisites**
Music 114, or permission of instructor.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

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**MUSI 215 - Theory III**

Credits: 3
Study of four-part chromatic harmony and analysis of 19th-century compositions.

**Prerequisites**
MUSI 116, or permission of instructor.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**When Offered**
F

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**MUSI 216 - Form and Analysis**

Credits: 3
Analytical study of evolution of musical formal structures based primarily on harmonic and textural principles.

**Prerequisites**
MUSI 215, or permission of instructor.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**When Offered**
S

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**MUSI 221 - Private Music Instruction I**

Credits: 1
Private lessons in performance or composition.

**Prerequisites**
Audition or portfolio.
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 222 - PMI Keyboard

Credits: 1
Private lessons in keyboard performance.

Prerequisites
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 223 - PMI Voice

Credits: 1
Private lessons in vocal performance.

Prerequisites
Audition.

Corequisite
MUSI 381, 384, or 385.

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 224 - PMI Woodwind
Credits: 1
Private lessons in woodwind performance.

Prerequisites
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 225 - PMI Brass

Credits: 1
Private lessons in brass performance.

Prerequisites
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 226 - PMI String

Credits: 1
Private lessons in string performance.

Prerequisites
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 - PMI Percussion
Credits: 1
Private lessons in percussion performance.

Prerequisites
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 228 - PMI Composition

Credits: 1
Private lessons in music composition.

Prerequisites
Portfolio of recent compositions.

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 241 - Private Music Instruction II

Credits: 2
Private lessons in music performance or composition.

Prerequisites
Audition or portfolio.

Notes
May be repeated for up to 16 credits.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
1

MUSI 242 - PMI Keyboard
Credits: 2
Private lessons in keyboard performance.

**Prerequisites**
Audition.

**Notes**
May be repeated for up to 16 credits.

**Hours of Lecture or Seminar per week**
0

**Hours of Lab or Studio per week**
1

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**MUSI 243 - PMI Voice**

Credits: 2
Private lessons in vocal performance.

**Prerequisites**
Audition.

**Corequisite**
MUSI 381, 384, or 385.

**Notes**
May be repeated for up to 16 credits.

**Hours of Lecture or Seminar per week**
0

**Hours of Lab or Studio per week**
1

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**MUSI 244 - PMI Woodwind**

Credits: 2
Private lessons in woodwind performance.

**Prerequisites**
Audition.

**Notes**
May be repeated for up to 16 credits.

**Hours of Lecture or Seminar per week**
0

**Hours of Lab or Studio per week**
1
MUSI 245 - PMI Brass

Credits: 2
Private lessons in brass performance.

Prerequisites
Audition.

Notes
May be repeated for up to 16 credits.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
1

MUSI 246 - PMI String

Credits: 2
Private lessons in string performance.

Prerequisites
Audition.

Notes
May be repeated for up to 16 credits.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
1

MUSI 247 - PMI Percussion

Credits: 2
Private lessons in percussion performance.

Prerequisites
Audition.

Notes
May be repeated for up to 16 credits.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
1
MUSI 248 - PMI Composition

Credits: 2
Private lessons in music composition.

Prerequisites
Portfolio of recent compositions.

Notes
May be repeated for up to 16 credits.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
1

MUSI 251 - The Art of Teaching Music

Credits: 3
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.

Prerequisites
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
F

MUSI 273 - Keyboard Skills III

Credits: 1
Continuation of MUSI 172. Study of techniques of harmonization at the piano keyboard.

Prerequisites
MUSI 172.

Notes
Nonmusic majors must have permission of instructor.
MUSI 300 - Recital Attendance

Credits: 0
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
0
Hours of Lab or Studio per week
3
Grading
S/NC
When Offered
F

MUSI 301 - Music in Motion Pictures

Credits: 3
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).

Prerequisites
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
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.

Prerequisites
30 credits.

Hours of Lecture or Seminar per week
MUSI 311 - Jazz Studies

Credits: 3
Musicianship course integrating jazz improvisation, theory, composition, and arranging. Focuses on concepts unique to our time in style, form, and harmony.

Prerequisites
MUSI 379.

MUSI 315 - Music Technology

Credits: 3
Study of technology related to music, including audio synthesis and computer-based hardware and software.

Prerequisites
MUSI 100 or 115

Notes
There is a course fee beyond tuition charges.

MUSI 316 - Topics in Music Technology

Credits: 3
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.

Prerequisites
MUSI 315

Notes
Can be repeated for up to 9 credits. There is a course fee beyond tuition charges.
MUSI 319 - Class Composition and Arranging

Credits: 3
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.

Prerequisites
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
F

MUSI 323 - Music Education Recital

Credits: 0
Recital on major instrument given by student during junior or senior year.

Prerequisites
Minimum 8 credits in private music instruction in major instrument

Corequisite
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
0
Hours of Lab or Studio per week
0
Grading
S/NC

MUSI 324 - Junior Recital

Credits: 1
Public recital by student during junior year.

Corequisite
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**
0

**Hours of Lab or Studio per week**
0

**MUSI 325 - Performance Seminar and Vocal Literature for Singers and Accompanists I**

Credits: 2
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.

**Prerequisites**
Audition.

**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
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.

**Prerequisites**
Audition.

**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
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.

**Prerequisites/Corequisites**
MUSI 215, or permission of instructor.
Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0
When Offered
S

MUSI 332 - Music History in Society II

Credits: 3
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.

Prerequisites
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
F

MUSI 341 - Diction for Singers I: Italian Diction and English Diction

Credits: 2
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.

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
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.

Hours of Lecture or Seminar per week
2
**MUSI 351 - Keyboard Pedagogy**

Credits: 3  
Investigates methods, theories, techniques, and materials to teach keyboard to children and adults in individual and group situations.

**Prerequisites**  
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**  
F, S

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**MUSI 352 - Vocal Pedagogy and Lab**

Credits: 3  
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.

**Hours of Lecture or Seminar per week**  
3

**Hours of Lab or Studio per week**  
1

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**MUSI 353 - Instrumental Pedagogy and Literature**

Credits: 3  
Instruction in teaching instrumental music techniques for all levels through study of pedagogical methods, standard literature, and musical instruments produced by present-day manufacturers.

**Prerequisites**  
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
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.

Prerequisites
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
0
Hours of Lab or Studio per week
4

MUSI 363 - Class Woodwinds: Flute and Clarinet

Credits: 1
Study of techniques of playing and teaching flute and clarinet. Survey of instructional materials, and mouthpiece and instrument selection.

Prerequisites
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
0
Hours of Lab or Studio per week
4

MUSI 364 - Class Woodwinds: Oboe and Bassoon

Credits: 1
Study of techniques of playing and teaching oboe and bassoon. Survey of instructional materials, instrument selection, and reed adjustment.

Prerequisites
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
0
MUSI 365 - Class Brass: Trumpet and French Horn

Credits: 1
Study of techniques of playing and teaching trumpet and French horn. Survey of instructional materials, and mouthpiece and instrument selection.

Prerequisites
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.

MUSI 366 - Class Percussion

Credits: 1
Study of techniques of playing and teaching percussion instruments. Survey of instructional materials and instrument selection.

Prerequisites
Admission to music major program, or permission of instructor.

Notes
Three hours per week studying percussion instruments; one hour per week in laboratory ensemble.

MUSI 367 - Class Guitar

Credits: 1
Study of techniques of playing and teaching guitar. Survey of instructional materials and instrument selection.

Prerequisites
Admission to music major program, or permission of instructor.

Notes
Three hours per week studying guitar; one hour per week in laboratory ensemble.
MUSI 368 - Class Voice

Credits: 1
Study of the human voice in artistic singing. Emphasizes practical application of basic principles.

Prerequisites
Admission to music major program, or permission of instructor.

Notes
Three hours per week studying voice; one hour per week in laboratory ensemble.

MUSI 369 - Class Brass: Trombone, Euphonium, and Tuba

Credits: 1
Study of techniques of playing and teaching trombone, euphonium, and tuba. Survey of instructional materials and mouthpiece and instrument selection.

Prerequisites
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.

MUSI 371 - Techniques of Accompanying I

Credits: 1
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.

Prerequisites
Successful audition on keyboard instrument for admission to music degree program; 4 credits in undergraduate private music instruction on a keyboard instrument; or permission of instructor.
MUSI 372 - Techniques of Accompanying II

Credits: 1
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.

Prerequisites
Successful audition on keyboard instrument for admission to 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
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."

MUSI 379 - Introduction to Jazz Improvisation

Credits: 1
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.

Prerequisites
MUSI 116, or permission of instructor.

Hours of Lecture or Seminar per week
1
Hours of Lab or Studio per week
2

MUSI 380 - Wind Symphony

Credits: 1
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.

Prerequisites
Audition.

Notes
Public concerts required.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
3
When Offered
F, S

MUSI 381 - University Chorale

Credits: 1
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.

Prerequisites
Audition.

Notes
Public concerts required.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
3
When Offered
F, S
MUSI 382 - Piano Ensemble

Credits: 1
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.

Prerequisites
Audition and 4 credits in private piano music instruction.

Notes
Public performances required.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
3

MUSI 383 - Symphonic Band

Credits: 1
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.

Prerequisites
Audition.

Notes
Public concerts required.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
3
When Offered
F, S

MUSI 384 - Symphonic Chorus

Credits: 1
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.

Prerequisites
Audition.

Notes
Public concerts are given.

Hours of Lecture or Seminar per week
MUSI 385 - Chamber Singers

Credits: 1
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.

Prerequisites
Audition.

MUSI 387 - Symphony Orchestra

Credits: 1
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.

Prerequisites
Audition.

Notes
Public concerts required.

MUSI 388 - Fundamental Techniques of Stagecraft for Opera and Music Theater

Credits: 2
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.

**Prerequisites**
Admission to music program, or permission of instructor.

**Hours of Lecture or Seminar per week**
2

**Hours of Lab or Studio per week**
1

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**MUSI 389 - Jazz Ensemble**

Credits: 1
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.

**Prerequisites**
Audition.

**Notes**
Public concerts required.

**Hours of Lecture or Seminar per week**
0

**Hours of Lab or Studio per week**
3

**When Offered**
F, S

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**MUSI 391 - Conducting I**

Credits: 2
Study of basic techniques of conducting a musical ensemble.

**Prerequisites**
MUSI 114, 216, and 273; or permission of instructor.

**Hours of Lecture or Seminar per week**
0

**Hours of Lab or Studio per week**
3

**When Offered**
F
Credits: 2
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.

**Prerequisites**
MUSI 116, or permission of instructor.

**Hours of Lecture or Seminar per week**
2

**Hours of Lab or Studio per week**
0

**When Offered**
S

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**MUSI 395 - Teaching Internship**

Credits: 1-4
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.

**Prerequisites**
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**
0

**Hours of Lab or Studio per week**
0

**When Offered**
F, S

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**MUSI 396 - Conducting II**

Credits: 2
Advanced conducting course emphasizing techniques for instrumental and choral conducting. Refining gestures, full score analysis and interpretation, rehearsal techniques, and changing meters.

**Prerequisites**
MUSI 391, or permission of instructor.

**Hours of Lecture or Seminar per week**
0

**Hours of Lab or Studio per week**
3
MUSI 401 - Impact of the Arts on Civilization

Credits: 3
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.

Prerequisites
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
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.

Prerequisites
MUSI 319, or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0
When Offered
S

MUSI 419 - Orchestration

Credits: 3
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.

Prerequisites
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
S
MUSI 421 - Private Music Instruction III

Credits: 1
Private lessons in performance or composition.

Prerequisites
Audition or portfolio.

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 424 - Senior Recital

Credits: 1
Public recital by student during senior year.

Corequisite
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
0
Hours of Lab or Studio per week
0

MUSI 431 - Music History in Society III

Credits: 3
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.

Prerequisites
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
S
MUSI 432 - Music History in Society IV

Credits: 3
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.

Prerequisites
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
F

MUSI 441 - Private Music Instruction IV

Credits: 2-3
Private lessons in performance or composition.

Prerequisites
Audition or portfolio.

Notes
May be repeated for up to 18 credits.

Hours of Lecture or Seminar per week
0

Hours of Lab or Studio per week
1

MUSI 442 - PMI Keyboard

Credits: 2-3
Private lessons in keyboard performance.

Prerequisites
Audition.

Notes
May be repeated for up to 18 credits.

Hours of Lecture or Seminar per week
0
MUSI 443 - PMI Voice

Credits: 2-3
Private lessons in vocal performance.

Prerequisites
Audition.

Corequisite
MUSI 381, 384, or 385.

Notes
May be repeated for up to 18 credits.

MUSI 444 - PMI Woodwind

Credits: 2-3
Private lessons in woodwind performance.

Prerequisites
Audition.

Notes
May be repeated for up to 18 credits.

MUSI 445 - PMI Brass

Credits: 2-3
Private lessons in brass performance.

Prerequisites
Audition.

Notes
May be repeated for up to 18 credits.

**Hours of Lecture or Seminar per week**
0

**Hours of Lab or Studio per week**
1

**MUSI 446 - PMI String**

Credits: 2-3
Private lessons in string performance.

**Prerequisites**
Audition.

**Notes**
May be repeated for up to 18 credits.

**Hours of Lecture or Seminar per week**
0

**Hours of Lab or Studio per week**
1

**MUSI 447 - PMI Percussion**

Credits: 2-3
Private lessons in percussion performance.

**Prerequisites**
Audition.

**Notes**
May be repeated for up to 18 credits.

**Hours of Lecture or Seminar per week**
0

**Hours of Lab or Studio per week**
1

**MUSI 448 - PMI Composition**

Credits: 2-3
Private lessons in music composition.

**Prerequisites**
Portfolio of recent compositions.
Notes
May be repeated for up to 18 credits.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
1

MUSI 450 - Jazz Improvisation I

Credits: 2
Emphasizes improvisational materials and language developed in common practice period of jazz.

Prerequisites
MUSI 379 or permission of instructor.

Hours of Lecture or Seminar per week
2
Hours of Lab or Studio per week
1

MUSI 451 - Keyboard Pedagogy II

Credits: 3
Intensive study of methods, theories, techniques, and materials to teach keyboard to children and adults in individual and group situations.

Prerequisites
MUSI 351.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

MUSI 452 - Jazz Improvisation II

Credits: 2
Emphasis on advanced improvisational techniques and contemporary tunes.

Prerequisites
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
Transcription, analysis, and scoring for small and large jazz ensembles.

**Prerequisites**
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
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.

**Prerequisites**
MUSI 114, 216, 273; and acceptance into music education concentration.

**Corequisite**
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**
F

**MUSI 463 - The Teaching of Vocal Music in the Secondary School**

Credits: 3
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.

**Prerequisites**
MUSI 114, 216, 273, and 391; and acceptance into music education concentration.

**Corequisite**
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
S

MUSI 464 - Instrumental Music Methods I

Credits: 3
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.

Prerequisites
MUSI 114, 216, and 273; and acceptance into music education concentration.

Corequisite
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
F

MUSI 465 - Selected Topics in Music Education

Credits: 1-3
Topics of practical interest to prospective and practicing music educators covering pedagogy, performance, and logistics of teaching music in schools, private studios, and communities.

Prerequisites
90 credits in music degree program, or permission of instructor.

Notes
May be repeated for credit.

Hours of Lecture or Seminar per week
1-3
MUSI 466 - Instrumental Music Methods II

Credits: 3
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.

Prerequisites
MUSI 114, 216, 273, and 391; and acceptance to music education concentration.

Corequisite
MUSI 396

Notes
For music majors only.

MUSI 467 - Instrumental Music Methods I: Orchestra

Credits: 3
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.

Prerequisites
MUSI 114, 216, 273, and 361; and acceptance into music education concentration.

Corequisite
MUSI 391

Notes
For music majors only.
MUSI 485 - Chamber Ensembles

Credits: 1
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.

Prerequisites
Audition.

Notes
Public performances required.

Hours of Lecture or Seminar per week
0

Hours of Lab or Studio per week
3

When Offered
F, S

MUSI 490 - Musical Communication in Context

Credits: 3
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.

Prerequisites
Students must be in senior year of BA 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
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.

Prerequisites
Completion of all other required general education courses for BM performance concentration.

Corequisite
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**

Credits: 1-3
Topics of practical interest to students in composition, music history and literature, world music, jazz studies, and performance practices.

**Prerequisites**
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
Topics of practical interest to students in music history course.

**Prerequisites**
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 492J - Selected Topics in Music**

Credits: 1-3
Topics of practical interest to students in jazz studies course.

**Prerequisites**
45 credits, or permission of instructor.
MUSI 492N - Selected Topics in Music

Credits: 1-3
Topics of practical interest to students in non-Western music course.

Prerequisites
45 credits, or permission of instructor.

Notes
May be repeated for credit.

MUSI 495 - Internship in Music Education: Student Teaching

Credits: 6
Full semester of intensive clinical experience in approved Virginia schools.

Prerequisites
Completion of all other courses required for BM with concentration in music education.

Notes
Maximum of 9 internship credits (MUSI 395, 495, 496) can be applied to degree.

MUSI 496 - Internship

Credits: 2-6
Contact the department one semester before enrollment. Internships are approved work-study programs with specific employers or agencies.
Prerequisites
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
0
Hours of Lab or Studio per week
0

MUSI 497 - Independent Study

Credits: 1-3
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.

Prerequisites
Music majors with 90 credits, and permission of instructor and department chair.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
0

MUSI 498 - Independent Study

Credits: 1-3
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.

Prerequisites
Music majors with 90 credits, and permission of instructor and department chair.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
0

MUSI 501 - Graduate Theory Review

Credits: 3
Vocabulary and conceptual review of diatonic and chromatic harmony, part writing, form, harmonization, 20th-century techniques.
Prerequisites
Baccalaureate degree in music, graduate placement exam.

Notes
Does not count toward required credits of a graduate music degree.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

MUSI 502 - Graduate Aural Skills Review

Credits: 3
Music reading and aural skills including intervals, dictation (melodic and harmonic), scales, chords, rhythms, and meter.

Prerequisites
Baccalaureate degree in music, graduate placement exam.

Notes
Does not count toward required credits of a graduate music degree.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

MUSI 515 - Music in Computer Technology

Credits: 3
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.

Prerequisites
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
S

MUSI 516 - Keyboard Skills
Credits: 3
Enhance keyboard skills for the non-keyboard major, including technique, harmonization, transposition, reading, and
accompanying.

**Prerequisites**
Baccalaureate degree in music, graduate placement exam.

**Hours of Lecture or Seminar per week**
0

**Hours of Lab or Studio per week**
4

**MUSI 517 - Score Reading Skills**

Credits: 3
Enhance score study and score reading skills for the conductor.

**Prerequisites**
Baccalaureate degree in music, graduate placement exam.

**Hours of Lecture or Seminar per week**
0

**Hours of Lab or Studio per week**
4

**MUSI 525 - Performance Seminar and Vocal Literature for Singers and Accompanists I**

Credits: 2
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.

**Prerequisites**
Audition. Advanced vocal literature and performance seminar.

**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
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.
Prerequisites
Audition. Advanced vocal literature and performance seminar.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
1

MUSI 532 - Music History Review I

Credits: 3
Enhance understanding of music history and the context of musical style, chronologically through the mid-18th century.

Prerequisites
Baccalaureate degree in music, graduate placement exam.

Notes
Does not fulfill course 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
Enhance understanding of music history and the context of musical style, from the mid-18th century to today.

Prerequisites
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
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.
MUSI 542 - Diction for Singers II: German Diction and French Diction

Credits: 2
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.

MUSI 551 - Keyboard Pedagogy I

Credits: 3
Intensive study of methods, theories, techniques, and materials to teach keyboard to children and adults in individual and group situations.

Prerequisites
Graduate status in applied piano, or permission of instructor.

MUSI 552 - Vocal Pedagogy and Lab

Credits: 3
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.

Prerequisites
MUSI 352, or permission of instructor.
MUSI 553 - Instrumental Pedagogy and Literature

Credits: 3
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.

Prerequisites
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
AY

MUSI 555 - Music as a Healing Art

Credits: 3
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.

Prerequisites
Basic proficiency with instrument or voice, and bachelor's degree in music.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

MUSI 563 - Orff Schulwerk I

Credits: 3
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.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

MUSI 564 - Orff Schulwerk II
Credits: 3
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.

Prerequisites
MUSI 563, or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

MUSI 565 - Orff Schulwerk III

Credits: 3
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.

Prerequisites
MUSI 563 and 564, or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

MUSI 571 - Techniques of Accompanying I

Credits: 1
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.

Prerequisites
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
0

Hours of Lab or Studio per week
3

When Offered
AY
MUSI 572 - Techniques of Accompanying II

Credits: 1
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.

Prerequisites
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
0
Hours of Lab or Studio per week
3
When Offered
AY

MUSI 573 - Accompanying and Musicianship III

Credits: 3
This course is for piano majors or students with significant keyboard skills.

Prerequisites
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
Intensive study of selected topics in performance, composition, or conducting. Individual research, group discussions, and participation in related activities.

Prerequisites
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
MUSI 610 - Topics in Music Theory

Credits: 3
Uses music analytical theories to examine repertoire from a given time period or style.

Prerequisites
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.

MUSI 611 - Analytical Techniques

Credits: 3
Detailed formal and stylistic examination of music selected from the major style periods. Development of graduate-level analytical skills.

Prerequisites
MUSI 501, 502, and 516, or appropriate score on the graduate placement examination.

MUSI 613 - Graduate Orchestration

Credits: 3
Intensive study of instrumentation through analysis and arrangement. Includes contemporary techniques and scoring for large forces.

Prerequisites
MUSI 501, 502, and 516, or appropriate score on the graduate placement examination.
MUSI 614 - Music Theory Pedagogy

Credits: 3
Study of materials and procedures in the teaching of undergraduate-level music theory subjects.

Prerequisites
Baccalaureate degree in music, graduate placement exam.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

MUSI 621 - Graduate Private Music Instruction

Credits: 1
Private lessons in performance or composition.

Prerequisites
Audition or portfolio.

Notes
May be repeated for up to 6 credits.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
0.5

MUSI 622 - PMI Keyboard

Credits: 1
Private lessons in keyboard performance.

Prerequisites
Audition.

Notes
May be repeated for up to 6 credits.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
0.5
MUSI 623 - PMI Voice

Credits: 1
Private lessons in vocal performance.

Prerequisites
Audition.

Notes
May be repeated for up to 6 credits.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
0.5

MUSI 624 - PMI Woodwind

Credits: 1
Private lessons in woodwind performance.

Prerequisites
Audition.

Notes
May be repeated for up to 6 credits.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
0.5

MUSI 625 - PMI Brass

Credits: 1
Private lessons in brass performance.

Prerequisites
Audition.

Notes
May be repeated for up to 6 credits.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
0.5
MUSI 626 - PMI String

Credits: 1
Private lessons in string performance.

Prerequisites
Audition.

Notes
May be repeated for up to 6 credits.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
0.5

MUSI 627 - PMI Percussion

Credits: 1
Private lessons in percussion performance.

Prerequisites
Audition.

Notes
May be repeated for up to 6 credits.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
0.5

MUSI 628 - PMI Composition

Credits: 1
Private lessons in composition.

Prerequisites
Portfolio of recent compositions.

Notes
May be repeated for up to 6 credits.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
0.5
MUSI 629 - PMI Conducting

Credits: 1
Private lessons in conducting.

Prerequisites
Audition.

Notes
May be repeated for up to 6 credits.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
0.5

MUSI 630 - Topics in Music History and Literature

Credits: 3
Examination of a musical style, genre, composer, compositional school, or historical development. Primary and secondary source materials studied in historical and analytical contexts.

Prerequisites
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
Study of musics from selected cultures. Students will study structural, social, and cognitive foundations of the music.

Prerequisites
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 654 - Graduate Conducting

Credits: 3
Classroom study of conducting, including refining gestures, rehearsal leadership, and the communication of musical style.

Prerequisites
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
Examination of specific areas of concern to music educators. Individual research, group discussions, and participation in related activities.

Prerequisites
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
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.

Prerequisites
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
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.

Prerequisites
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
F

MUSI 663 - Aesthetics of Music Education

Credits: 3
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.

Prerequisites
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
Performance of works from the choral repertoire.

Prerequisites
Audition.

Notes
Public concerts are given. May be repeated for up to 6 credits total.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
3
MUSI 682 - Wind Symphony

Credits: 1
Highly selective group of instrumentalists performing works from the wind repertoire.

Prerequisites
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 683 - Symphonic Band

Credits: 1
Performance of works from band repertoire.

Prerequisites
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 685 - Graduate Chamber Ensemble

Credits: 1
Performance of works from chamber music repertoire.

Prerequisites
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 687 - Symphony Orchestra

Credits: 1
Performance of works from orchestral repertoire.

Prerequisites
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 688 - Opera and Musical Theater Ensemble

Credits: 3
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.

Prerequisites
Audition.

Notes
May be repeated for up to 12 credits.

Hours of Lecture or Seminar per week
2
Hours of Lab or Studio per week
4

MUSI 689 - Jazz Ensemble

Credits: 1
Provides practical experience in aspects of jazz performance. Participation in section rehearsals and small and large jazz groups. Jazz improvisation expected.

Prerequisites
Audition.

Notes
Public concerts given. May be repeated for up to 6 credits total.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
3

MUSI 690 - Graduate Lecture Recital

Credits: 1-3
Combination of musical performance and scholarly presentation on a well-defined topic.

Prerequisites
Baccalaureate degree in music, audition.

Corequisite
MUSI 621 (3-credit level).

Notes
Public presentation required. May be repeated for a maximum of 6 credits.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
0

MUSI 695 - Teaching Internship

Credits: 2
Teaching beginner, intermediate, and early advanced students in private or group lessons under faculty supervision.

Prerequisites
MUSI 660.

Notes
May be repeated for up to 4 credits.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
0

MUSI 699 - Independent Study

Credits: 1-3
Individual research and study a concentration available in the master of music.

Prerequisites
Baccalaureate degree in music, and permission of department chair.

Notes
May be taken for maximum 6 credits.

**Hours of Lecture or Seminar per week**
0

**Hours of Lab or Studio per week**
0

**MUSI 710 - Advanced Topics in Music Theory**

Credits: 3  
Advanced study of specific styles and repertoire from the perspective of various analytical approaches.

**Prerequisites**  
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

**MUSI 712 - Composition for Conductors and Performers**

Credits: 3  
Advanced study of new music for various media.

**Prerequisites**  
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  
Advanced study of concepts in applied music.

**Prerequisites**  
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 721 - Private Music Instruction

Credits: 2-3
Private lessons in performance or composition.

Prerequisites
Audition or portfolio.

Notes
May be repeated for up to 18 credits.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
1

MUSI 722 - PMI Piano

Credits: 2-3
Private lessons in piano performance.

Prerequisites
Audition.

Notes
May be repeated for up to 18 credits.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
1

MUSI 723 - PMI Voice

Credits: 2-3
Private lessons in vocal performance.

Prerequisites
Audition.
Notes
May be repeated for up to 18 credits.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
1

**MUSI 724 - PMI Woodwind**

Credits: 2-3
Private lessons in woodwind performance.

Prerequisites
Audition.

Notes
May be repeated for up to 18 credits.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
1

**MUSI 725 - PMI Brass**

Credits: 2-3
Private lessons in brass performance.

Prerequisites
Audition.

Notes
May be repeated for up to 18 credits.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
1

**MUSI 726 - PMI String**

Credits: 2-3
Private lessons in string performance.

Prerequisites
Audition.

Notes
May be repeated for up to 18 credits.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
1

MUSI 727 - PMI Percussion

Credits: 2-3
Private lessons in percussion performance.

Prerequisites
Audition.

Notes
May be repeated for up to 18 credits.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
1

MUSI 728 - PMI Composition

Credits: 2-3
Private lessons in music composition.

Prerequisites
Portfolio of recent compositions.

Notes
May be repeated for up to 18 credits.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
1

MUSI 729 - PMI Conducting

Credits: 2-3
Private lessons in conducting.
**Prerequisites**
Audition.

**Notes**
May be repeated for up to 18 credits.

**Hours of Lecture or Seminar per week**
0

**Hours of Lab or Studio per week**
1

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**MUSI 730 - Advanced Topics in Music History**

Credits: 3
Advanced study of specific genres, composers, or repertoire from a historically analytical perspective.

**Prerequisites**
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

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**MUSI 760 - Advanced Topics in Music Education**

Credits: 3
Advanced study of selected issues in music education.

**Prerequisites**
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

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**MUSI 770 - Advanced Topics in Pedagogy**

Credits: 3
Advanced study of a specific topic in the pedagogy of music.
Prerequisites
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
Public performance. Repertoire and performance standards as approved by faculty.

Prerequisites
At least three credits graduate PMI in the appropriate instrument or voice.

Corequisite
MUSI 72X (3-credit level).

Notes
May be repeated for up to 4 credits total.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
0

MUSI 796 - Directed Reading/Research

Credits: 1-3
Individualized study on a topic approved by faculty.

Prerequisites
Baccalaureate degree in music, graduate placement exam.

Notes
May be repeated for up to 6 total credits.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
0
MUSI 799 - Thesis

Credits: 1-6
Supervised research on approved thesis topic.

Prerequisites
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.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
0
Grading
S/NC

MUSI 800 - Studies for the Doctor of Philosophy in Education

Credits: Variable
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.

Prerequisites
Admission to PhD in education program to study music.

Notes
Enrollment may be repeated.

MUSI 810 - Doctoral Seminar in Analysis

Credits: 3
Seminar study of a specific genre or repertoire from various analytical perspectives.

Prerequisites
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 821 - Doctoral Private Music Instruction

Credits: 2-3
Private instruction in performance, conducting, or composition.

Prerequisites
Audition portfolio

Notes
May be repeated for up to 18 credits.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
1

MUSI 822 - Doctoral Private Music Instruction Piano

Credits: 2-3
Private instruction in piano performance.

Prerequisites
Audition.

Notes
May be repeated for up to 18 credits.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
1

MUSI 823 - Doctoral Private Music Instruction Voice

Credits: 2-3
Private instruction in vocal performance.

Prerequisites
Audition.

Notes
May be repeated for up to 18 credits.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
1
MUSI 824 - Doctoral Private Music Instruction Woodwind

Credits: 2-3
Private lessons in woodwind performance.

Prerequisites
Audition.

Notes
May be repeated for up to 18 credits.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
1

MUSI 825 - Doctoral Private Music Instruction Brass

Credits: 2-3
Private lessons in brass performance.

Prerequisites
Audition.

Notes
May be repeated for up to 18 credits.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
1

MUSI 826 - Doctoral Private Music Instruction String

Credits: 2-3
Private lessons in string performance.

Prerequisites
Audition.

Notes
May be repeated for up to 18 credits.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
1
MUSI 827 - Doctoral Private Music Instruction Percussion

Credits: 2-3
Private lessons in percussion performance.

Prerequisites
Audition.

Notes
May be repeated for up to 18 credits.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
1

MUSI 828 - Doctoral Private Music Instruction Composition

Credits: 2-3
Private lessons in composition.

Prerequisites
Portfolio of recent compositions.

Notes
May be repeated for up to 18 credits.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
1

MUSI 829 - Doctoral Private Music Instruction Conducting

Credits: 2-3
Private lessons in conducting.

Prerequisites
Audition.

Notes
May be repeated for up to 18 credits.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
1
MUSI 830 - Doctoral Seminar in Music History

Credits: 3
Seminar study of a specific genre, composer, or repertoire from a historically analytical perspective.

Prerequisites
Graduate placement exam.

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 860 - Doctoral Seminar in Music Education

Credits: 3
Seminar study of a specific issue in music education.

Prerequisites
Graduate placement exam.

Notes
May be repeated for up to 12 credits as topics change.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

MUSI 880 - Doctoral Major Ensemble

Credits: 1
Selective ensemble experience for doctoral students in music.

Prerequisites
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: 1-2
Public performance. Repertoire and performance standards as approved by faculty.

Prerequisites
At least 3 credits in MUSI 821 in the appropriate instrument or voice.

Corequisite
MUSI 821 (3-credit level).

Notes
May be repeated for up to 4 credits.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
0

MUSI 998 - Dissertation Proposal

Credits: 1-3
Preparation of a proposal for a dissertation study in music under the supervision of music faculty members.

Prerequisites
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

MUSI 999 - Dissertation

Credits: 1-6
Preparation of a dissertation in music under the supervision of music faculty members.

Prerequisites
Candidacy in a doctoral program in music.

Notes
May be repeated for credit.

Hours of Lecture or Seminar per week
0
NAIS 201 - Introduction to Native American and Indigenous Studies

Credits: 3
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
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

NANO 500 - Introduction to Nanomaterials and Interactions

Credits: 3
Introduction to nanotechnology. Discussion of the Feynman challenge and its relation to modern science. Applications to nanostructures of charges, currents, diamagnetics, paramagnetics, and ferromagnetics.

Prerequisites
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
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.
Prerequisites
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
Discusses nanomechanical oscillators and nanoresonators, nanofibers, and conducting polymer nanowires. Nanomechanical beams for reacting ion etching. Electron-beam lithography and photolithography.

Prerequisites
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
Covers pulsed laser deposition, molecular beam epitaxy, controlled vapor deposition, reactive sputtering, and doping and implant isolation.

Prerequisites
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
Discusses 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.

Prerequisites
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

Credits: 3
Introduces basic elements of nanoelectronic structures, including quantum layers, quantum wires, and quantum dots. Covers subband structure, transport in quantum layers, behavior in the presence of magnetic fields, Coulomb blockades, CMOS nanodevices and nanoelectronics, and SOI multigate device physics and modeling.

Prerequisites
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

NANO 620 - Computational Modeling in Nanoscience

Credits: 3
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.

Prerequisites
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

NCLC 101 - Narratives of Identity

Credits: 6
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.

Notes
This course fulfills the general education requirements in oral communication and literature.

Hours of Lecture or Seminar per week
**NCLC 102 - Global Communities and Networks**

Credits: 6  
Examines important global issues that shape our world today through the concept of food sheds, the production and distribution of food regionally and globally. Develops an understanding of how these issues are handled in different cultural traditions. Uses information technology as an integral tool that students use to gather, analyze and present data.

**Notes**  
This course fulfills the general education requirements in information technology and global understanding.

**Hours of Lecture or Seminar per week**  
6

**Hours of Lab or Studio per week**  
0

**NCLC 103 - Human Creativity: Science and Art**

Credits: 6  
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.

**Notes**  
This course fulfills the general education requirements in arts and natural science (non-lab).

**NCLC 111 - Composition, Communication and Community**

Credits: 7  
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
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

Credits: 1-12
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.

Prerequisites
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
Internship credit may be applied to 12 credits required in experiential learning.

Prerequisites
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
NCLC 194 - Service-Learning Experience

Credits: 1-15
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.

NCLC 195 - Field-Based Work

Credits: 1-15
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.

NCLC 196 - Teaching Assistant Experience

Credits: 1-6
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.
NCLC 197 - Add-On Experiential Learning

Credits: 1-3
For students who wish to add one or more experiential learning credit to existing experiential learning course or learning community.

Prerequisites
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
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: 4
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: 3-15
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
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
Transforms students’ learning in the classroom through action in their communities. Explores the relationships between individual acts and society’s social and political structures. Students design a semester-long, community-based research project, choose appropriate qualitative and quantitative approaches, and develop a repertoire of community research strategies.

Notes
This course fulfills the general education requirement in social and behavioral sciences.

Hours of Lecture or Seminar per week
6

Hours of Lab or Studio per week
0

NCLC 204 - Leadership Theory and Practice
Credits: 3
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 211 - Introduction to Conservation Studies**

Credits: 6
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 220 - Energy and Environment**

Credits: 3-15
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.

Hours of Lecture or Seminar per week
3-15
Hours of Lab or Studio per week
0

**NCLC 225 - Dean's Honor Book Review**

Credits: 1
Open to New Century College students admitted with a GPA of 3.30 or better. Considers the ways in which specific works such as books, dramas, works of art, or ideas have influenced the intellectual climate of their times and beyond.

Hours of Lecture or Seminar per week
1
Hours of Lab or Studio per week
0
NCLC 226 - Dean's Honors Seminar

Credits: 1
Considers dynamic relationship of author or artist with cultural and intellectual climate of times and beyond. Broader question is how one helps create culture and is influenced by it.

Prerequisites
Students must have entered New Century College with GPA of 3.30 or greater, or with 6 or more AP credits.

Hours of Lecture or Seminar per week
1
Hours of Lab or Studio per week
0

NCLC 230 - Math and Culture

Credits: 3-15
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
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
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

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**NCLC 245 - Visual Culture and Society**

Credits: 4
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

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**NCLC 249 - The Internet: Literacy, HTML Tools, and Virtual Community**

Credits: 3-15
Introduction to cyberspace, the Internet, and web. Students learn basic HTML to create individual and collaborative web pages. In addition to using e-mail, students explore use of listservs, online discussion forums, and virtual communities. Assignments include collaborative and individual web pages, analytical and creative papers, and online research.

**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

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**NCLC 265 - Independent Study**

Credits: 1-12
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.

**Prerequisites**
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

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**NCLC 275 - Special Topics**

Credits: 3-15
Studies topics of special interest to undergraduates.

**Notes**
May be repeated for credit if subtitle is different.

**Hours of Lecture or Seminar per week**
3-15

**Hours of Lab or Studio per week**
0

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**NCLC 290 - Internship**

Credits: 1-6
Internship credit may be applied to 12 credits required in experiential learning.

**Prerequisites**
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**
0

**Hours of Lab or Studio per week**
1-6

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**NCLC 294 - Service-Learning Experience**

Credits: 1-15
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.
NCLC 295 - Field-Based Work

Credits: 1-15
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.

NCLC 296 - Teaching Assistant Experience

Credits: 1-6
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.

NCLC 297 - Add-On Experiential Learning

Credits: 1-3
For students who wish to add one or more experiential learning credit to existing experiential learning course or learning community.

Prerequisites
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
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
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.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**NCLC 304 - Social Movements and Community Activism**

Credits: 4
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.

**Notes**
One credit of experiential learning enables students to explore their role as social advocates and effective citizens in context of community.
NCLC 305 - Conflict Resolution and Transformation

Credits: 6
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.

NCLC 306 - Our Common Futures

Credits: 3-15
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.

NCLC 307 - Narratives of Nature

Credits: 6
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.

NCLC 308 - American Landscapes in Fiction, Film, and History

Credits: 6
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.

Notes
Satisfies requirements for ENGL 302.

Hours of Lecture or Seminar per week
4

Hours of Lab or Studio per week
2

NCLC 310 - Violence and Gender

Credits: 3-15
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.

Hours of Lecture or Seminar per week
3-15

Hours of Lab or Studio per week
0

NCLC 311 - The Mysteries of Migration: Consequences for Conservation

Credits: 3-15
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.

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: 3-15
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.

Hours of Lecture or Seminar per week
3-15

Hours of Lab or Studio per week
0
NCLC 313 - Strangers in a Strange Land: Immigration in 20th Century America

Credits: 3-15
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.

Hours of Lecture or Seminar per week
3-15
Hours of Lab or Studio per week
0

NCLC 315 - Spirituality and Conflict Transformation

Credits: 6
Examines dimensions of spirituality, including peacemaking efforts in large-scale conflicts, conflicts within faith communities, and interpersonal disputes. Experiential learning explores spiritually informed resolution.

Hours of Lecture or Seminar per week
6
Hours of Lab or Studio per week
0

NCLC 317 - Issues in Family Relationships

Credits: 4
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.

Prerequisites
55 credits.

Notes
One credit counts for experiential learning; students complete 45 credits of course-related work outside classroom.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
1

NCLC 318 - Exploring Virginia's Watersheds

Credits: 4
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.
Prerequisites
HIST 120, 121, 122, or equivalent; and EVPP 110 or GEOG 102 or GEOL 109 or NCLC 120.

Hours of Lecture or Seminar per week
4

Hours of Lab or Studio per week
0

NCLC 320 - Construction of Differences: Race, Class, and Gender

Credits: 3-15
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.

Hours of Lecture or Seminar per week
3-15

Hours of Lab or Studio per week
0

NCLC 325 - Dean's Honor Book Review

Credits: 1
Open to New Century College students who have had a previous semester GPA of 3.30 or better and at least 30 college credits. Focuses on classical philosophers and artists and the impact of their works for contemporary times.

Notes
May be repeated for credit if the topic is different.

Hours of Lecture or Seminar per week
1

Hours of Lab or Studio per week
0

NCLC 326 - Dean's Honors Seminar

Credits: 1
Focuses on a variety of topics of interest ranging from book and film reviews to development of special events and symposiums.

Prerequisites
Overall GPA of 3.30 or greater while in New Century College.

Notes
May be repeated for credit if the topic is different.

Hours of Lecture or Seminar per week
1
NCLC 330 - Enterprise Development

Credits: 3-15
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.

Hours of Lecture or Seminar per week
3-15

Hours of Lab or Studio per week
0

NCLC 331 - The Nonprofit Sector

Credits: 4
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.

Notes
Includes 1 experiential learning credit.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
1

NCLC 333 - The Nature of Mathematics

Credits: 3
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.

Prerequisites
Performance on Math Placement Exam equivalent to requirements for entrance to math, successful completion of algebra program in mathematics learning center, or any mathematics course that fulfills university's general education requirement in quantitative reasoning; and permission of instructor.

Notes
May be taken even after credit for MATH 106 or equivalent has been received. Enrollment in NCLC 395 Experiential Learning is optional for at least 1 credit.
NCLC 335 - Ethics, Communication, and Freedom

Credits: 3-15
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.

Prerequisites
Sophomore standing and 3 credits each of communication and philosophy; or permission of instructor.

NCLC 340 - Progress: Can America Figure Out What It Means?

Credits: 3-15
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.

NCLC 341 - Progress: Washington, the New Edge City?

Credits: 3-15
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.

Notes
Students may take either Part I or Part II of this course but are encouraged to take both.
NCLC 343 - Interactive Digital Texts

Credits: 3
Cross-Listed with ENGL 343

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.

Prerequisites
English 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: 3-15
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.

Hours of Lecture or Seminar per week
3-15

Hours of Lab or Studio per week
0

NCLC 346 - Art as Social Action

Credits: 4
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.

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
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.

**Hours of Lecture or Seminar per week**
3-6

**Hours of Lab or Studio per week**
0

### NCLC 348 - Information in the Digital Age

Credits: 6
Examines how purpose and function relate to form and how digital material can attract or hinder audience responsiveness. Unique concerns of copyright, security, and privacy in a digital environment are considered. By looking at significant social, cultural, ethical, business, and economic consequences of the digital age, students gain hands-on experience in working with and assessing digital information.

**Prerequisites**
NCLC 249.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
3

### NCLC 349 - Writing for Multimedia

Credits: 4
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.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
1

### NCLC 350 - Cyberculture

Credits: 6
Research and write reports about ethical, social, educational, and cultural dynamics of online communities. Students examine who forms and has access to these communities, various types of communities, how people represent themselves online,
electronic mediums they use, how technology shapes human interactions, and vice versa. Extensive online discussion component; students post their work on the web. Student groups create a cybertulture web site as the final project.

**Prerequisites**
NCLC 249, or permission of instructor.

**Notes**
Students expected to know basic web publishing.

**Hours of Lecture or Seminar per week**
6

**Hours of Lab or Studio per week**
0

**NCLC 360 - The Built Environment**

Credits: 3-15
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.

**Hours of Lecture or Seminar per week**
3-15

**Hours of Lab or Studio per week**
0

**NCLC 361 - Neighborhood, Community, and Identity**

Credits: 3-15
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.

**Hours of Lecture or Seminar per week**
3-15

**Hours of Lab or Studio per week**
0

**NCLC 365 - Independent Study**

Credits: 1-12
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.

**Prerequisites**
Permission of instructor and dean.

Notes
Maximum 12 credits can be used to fulfill graduation requirements.

**NCLC 375 - Special Topics**

Credits: 3-15
Studies topics of special interest to undergraduates.

Notes
May be repeated for credit if subtitle 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
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.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**NCLC 379 - Cancer and Its Social Impact**

Credits: 4
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.

**Prerequisites**
60 credits, or permission of instructor.
NCLC 381 - When Cultural Worlds Collide

Credits: 3-15
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.

NCLC 390 - Internship

Credits: 1-6
Internship credit may be applied to 12 credits required in experiential learning.

Prerequisites
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 391 - Introduction to Integrative Studies

Credits: 3
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.

Notes
Students may not enroll in this course after completing 12 or more learning community credits or simultaneously with or after completing NCLC 491.

**NCLC 394 - Service-Learning Experience**

Credits: 1-15  
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 395 - Field-Based Work**

Credits: 1-15  
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 396 - Teaching Assistant Experience**

Credits: 1-6  
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
NCLC 397 - Add-On Experiential Learning

Credits: 1-3
For students who wish to add one or more experiential learning credit to existing experiential learning course or learning community.

Prerequisites
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.

NCLC 398 - Field-Based Work

Credits: 1-15
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.

NCLC 401 - Conservation Biology

Credits: 3-15
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.
Junior standing, or permission of instructor.

**NCLC 404 - Ethics and Leadership**

Credits: 4  
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?

**Hours of Lecture or Seminar per week**  
4

**Hours of Lab or Studio per week**  
0

**NCLC 410 - Contemporary Health Issues**

Credits: 3-15  
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.

**Hours of Lecture or Seminar per week**  
3-15

**Hours of Lab or Studio per week**  
0

**NCLC 420 - Work Effectiveness Skills**

Credits: 3-15  
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**  
3-15

**Hours of Lab or Studio per week**  
0

**NCLC 422 - An Experiential Approach to American Foreign Policy**
Credits: 3-15
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
3-15

Hours of Lab or Studio per week
0

**NCLC 423 - Management in the Global Marketplace**

Credits: 6
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 426 - Dean's Honors Research/Thesis**

Credits: 3
Research related to an aspect of your specialization or BIS project. Course will require analysis, quantitative interpretation, and a minimum 15-page thesis to be presented in written and oral form.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

**NCLC 431 - Principles of Fund Raising**

Credits: 4
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.

Prerequisites
NCLC 331.

Notes
Includes 1 experiential learning credit.
NCLC 435 - Leadership in a Changing Environment

Credits: 4
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.

Prerequisites
60 credits.

NCLC 440 - Death, Dying, and Decision Making

Credits: 3
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.

Prerequisites
60 credits, or permission of instructor

NCLC 445 - Multimedia Design

Credits: 5
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.

Prerequisites
NCLC 345, or permission of instructor.
Hours of Lab or Studio per week
1

NCLC 446 - Art, Beauty, and Culture

Credits: 3-6
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
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 computerbased 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.

Prerequisites
NCLC 345, or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
1

NCLC 465 - Independent Study

Credits: 1-12
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.

Prerequisites
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
NCLC 475 - Special Topics

Credits: 3-15
Studies topics of special interest to undergraduates.

Notes
May be repeated for credit if subtitle is different.

NCLC 490 - Internship

Credits: 1-6
Internship credit may be applied to 12 credits required in experiential learning.

Prerequisites
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
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).
NCLC 494 - Service-Learning Experience

Credits: 1-15
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: 1-15
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
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
For students who wish to add one or more experiential learning credit to existing experiential learning course or learning community.

Prerequisites
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
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 504 - Leadership Theory, Praxis, and Development for the Information Technology Professional

Credits: 3
The following courses were not found in the supplied content but, were listed in program requirements. Please review and provide us, if possible, with the correct information.

NCLC 510 - Institutional Records Keeping

Credits: 3
Explores theory and mechanics of animal records keeping at zoological and aquarium institutions and how AZA, ISIS, SSPs®, TAGs, PMPs, WCMC, studbooks, and animal records collected in the ISIS database combine forces to manage captive populations.

Hours of Lecture or Seminar per week
NCLC 511 - Career Development

Credits: 3
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.

Prerequisites
PUAD 505 or permission of instructor.

NCLC 512 - Organizational Development

Credits: 3
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.

Prerequisites
NCLC 511

NCLC 513 - Population Management I: Data Acquisition and Processing

Credits: 3
Teaches students to use SPARKS software and collect, process, and enter data into the studbook computer software program to manage captive populations in zoos and aquariums. Introduces principles of captive population management and genetics.

Prerequisites
Admission to MAIS ZAL program or permission of instructor.
NCLC 514 - Population Management II: Data Analysis and Breeding Recommendations

Credits: 3
Educates students to be competent population managers with the ability to manage the genetic health of captive populations in zoos and aquariums.

Prerequisites
NCLC 513

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
1

NCLC 520 - Conservation Education

Credits: 3
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.

Prerequisites
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
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.

Prerequisites
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
Focuses on the study of animal behavior, exhibit enrichment, training, and animal welfare in modern zoos and aquariums. Topics include history, philosophy, and theory of animal welfare and husbandry planning.

**Prerequisites**
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 531 - Principles of Elephant Management**

Credits: 3
Train students to be competent elephant managers through understanding and application of behavioral science, reproductive physiology, population genetics, and conflict resolution.

**Prerequisites**
Admission to the MAIS ZAL program or permission of instructor.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
1

**NCLC 625 - Online Library Research for the Zoo and Aquarium Professional**

Credits: 3
Examines technologies such as full-text databases, open access publishing, and websites. Develops an understanding of expectations of the scientific method and ethical conduct among zoo and aquarium professionals. Covers case studies of appropriate conduct including peer review, allocation of credit, animal welfare, and conservation education. Students review cases, conduct independent research, and draw on their own professional experiences to demonstrate an understanding of appropriate process and moral behavior.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**NEUR 600 - Chemistry and the Brain**

Credits: 3
**Cross-Listed with** PSYC 556

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.

Prerequisites
Admission to neuroscience PhD program or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

NEUR 601 - Developmental Neuroscience

Credits: 2
Cross-Listed with PSYC 527

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.

Prerequisites
PSYC 372, or BIOL 213 and 303.

Hours of Lecture or Seminar per week
2

Hours of Lab or Studio per week
0

NEUR 602 - Cellular Neuroscience

Credits: 3
Cross-Listed with BIOS 721

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.

Prerequisites
Admission to PhD program in biosciences or neuroscience, or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

NEUR 603 - Mammalian Neurobiology

Credits: 3
Cross-Listed with PSYC 531
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.

**Prerequisites**
PSYC 527.

**Hours of Lecture or Seminar per week**
2

**Hours of Lab or Studio per week**
3

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**NEUR 604 - Ethics in Scientific Research**

Credits: 1-3

**Cross-Listed with PHIL 691**

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.

**Hours of Lecture or Seminar per week**
1-3

**Hours of Lab or Studio per week**
0

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**NEUR 634 - Neural Modeling**

Credits: 3

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.

**Prerequisites**
NEUR 602 or permission of instructor.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

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**NEUR 689 - Topics in Neuroscience**
Credits: 3
Selected topics in neuroscience reflecting specialized areas or new subfields not covered in fixed-content neuroscience courses.

**Prerequisites**
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

**NEUR 701 - Neurophysiology Laboratory**

Credits: 2
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.

**Prerequisites**
NEUR 602 and admission to neuroscience PhD program or permission of instructor.

**Notes**
Meets once weekly for six hours.

**Hours of Lecture or Seminar per week**
0

**Hours of Lab or Studio per week**
6

**NEUR 702 - Research Methods**

Credits: 3
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.

**Prerequisites**
Graduate standing.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0
**NEUR 709 - Neuroscience@GMU Seminars**

Credits: 1
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.

**Prerequisites**
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
Examines topics in neurosciences, including neurogenetics, neural imaging, and the competing computational and biological approaches to understanding the mind.

**Prerequisites**
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
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.

**Prerequisites**
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
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.

Prerequisites
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
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.

Prerequisites
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
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.

Prerequisites
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
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.

Prerequisites
NEUR 603 or CSI 734, or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

NEUR 752 - Modern Instrumentation in Neuroscience

Credits: 3
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.

Prerequisites
NEUR 602 or 734, or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

NEUR 851 - Advanced Computation and Brain Dynamics

Credits: 3
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.

Prerequisites
NEUR 603 or CSI 734, or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

NEUR 996 - Doctoral Reading and Research

Credits: 1-6
Reading and research on specific topic in neuroscience under direction of faculty member.
**Prerequisites**
Admission to NEUR PhD, and permission of instructor.

**Notes**
May be repeated as needed.

**NEUR 998 - Dissertation Proposal**

Credits: 1-12
Covers development of a research proposal under guidance of dissertation director and doctoral committee. Proposal forms the basis for the doctoral dissertation.

**Prerequisites**
Permission of advisor.

**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.

**Grading**
S/IP

**NEUR 999 - Doctoral Dissertation**

Credits: 1-12
Doctoral research performed under the direction of the dissertation director.

**Prerequisites**
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.
Grading
S/IP

NSCI 210 - Introduction to Neuroscience

Credits: 3
Introduction to basic concepts and information across a broad range of current areas of neuroscience research. Prerequisite to all other courses in neuroscience.

Prerequisites
Completion of 30 credits, including BIOL 213, or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

NSCI 327 - Cellular, Neurophysiological, and Pharmacological Neuroscience

Credits: 3
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.

Prerequisites
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

NSCI 335 - Molecular, Developmental, and Systems Neuroscience

Credits: 3
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.

Prerequisites
NSCI 210 or permission of instructor.

Hours of Lecture or Seminar per week
2

Hours of Lab or Studio per week
3
NSCI 461 - Special Topics in Neuroscience

Credits: 1-3
Selected topics reflecting interest in specialized areas of neuroscience.

Prerequisites
PSYC 372, 375, or equivalent or permission of instructor.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
1-3

NURS 305 - Application of Basic Nursing Techniques

Credits: 1
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.

Prerequisites
Acceptance into accelerated second degree pathway.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
2

NURS 309 - Introduction to Basic Nursing Care

Credits: 3
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.

Corequisite
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
Application of basic nursing care in acute care settings utilizing the nursing process.

Prerequisites
Acceptance into accelerated second degree program.

Hours of Lecture or Seminar per week
0

Hours of Lab or Studio per week
9

NURS 319 - Pathophysiological Basis for Nursing Care of Individuals and Small Groups

Credits: 4
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.

Prerequisites
Acceptance into second degree program.

Hours of Lecture or Seminar per week
4

Hours of Lab or Studio per week
0

NURS 325 - Application of Nursing Care for Individuals and Small Groups II

Credits: 5
Enrollment restricted to second-degree international students only. Seven weeks of clinical with focus on obstetric and family nursing, and seven weeks of pediatric nursing. Students may also follow selected clients in clinics or home situations.

Prerequisites
NURS 309, 310, 318, 328, 329, and 428

Corequisite
NURS 426, 440, 430, and 455.

Notes
Clinical consists of two full days at acute care clinical agencies.

Hours of Lecture or Seminar per week
0

Hours of Lab or Studio per week
15

When Offered
S
NURS 330 - Nursing Fundamentals

Credits: 3
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.

Prerequisites
Junior standing.

Corequisite
NURS 331.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

When Offered
F

NURS 331 - Nursing as a Process for Health Practicum

Credits: 2
Opportunity to practice health assessment and fundamental nursing technologies while using communication skills with culturally diverse and vulnerable populations in a variety of settings.

Prerequisites
Junior standing.

Corequisite
NURS 330.

Notes
Includes agency and campus labs.

Hours of Lecture or Seminar per week
0

Hours of Lab or Studio per week
6

When Offered
F

NURS 332 - Concepts of Health Promotion and Disease Prevention throughout the Lifespan

Credits: 3
Introduces epidemiology, health promotion, and disease prevention; and the impact 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, learning as they apply to nursing.
Prerequisites
Junior standing.

NURS 334 - Nursing as a Health Profession and Discipline

Credits: 3
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.

Prerequisites
Open only to RNs, LPNs, and second-degree students

Corequisite
NURS 309 and 310 for second-degree students only.

NURS 337 - Applied Nursing Fundamentals and Health Assessment

Credits: 1
Opportunity to practice health assessment and fundamental nursing technologies while using communication skills with culturally diverse and vulnerable populations in a variety of settings.

Prerequisites
Junior standing.

Corequisite
NURS 330 and 331

NURS 343 - Pharmacology
Credits: 3
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
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.

Prerequisites
Successful completion of NURS 330, 331, 332, and 333

Corequisite
NURS 341.

Hours of Lecture or Seminar per week
0

Hours of Lab or Studio per week
2

When Offered
S

NURS 345 - Nursing of Clients in an Acute-Care Setting

Credits: 5
Concentrated clinical course in an acute-care setting. Opportunity to provide collaborative nursing care to culturally diverse adults experiencing acute or chronic health problems.

Prerequisites
Successful completion of fall and spring junior nursing courses

Corequisite
NURS 346

Hours of Lecture or Seminar per week
0

Hours of Lab or Studio per week
15

When Offered
SUM
NURS 346 - Case Studies in Medical Surgical Nursing

Credits: 1
Meets every week for two hours. Explores in-depth nursing care related to culturally diverse adults experiencing acute and chronic health problems. Uses case presentations dealing with adult family members with health problems.

Corequisite
NURS 345.

Hours of Lecture or Seminar per week
1
Hours of Lab or Studio per week
0
When Offered
SUM

NURS 347 - Adult Pathophysiology and Nursing Care

Credits: 2
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.

Prerequisites
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
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.

Prerequisites
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
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.

**Prerequisites**
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
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.

**Prerequisites**
NURS 334, 305, 309, 310, 319, and 425

**Corequisite**
NURS 351, 419, and 353.

**Notes**
Open to accelerated second degree students

**Hours of Lecture or Seminar per week**
0

**Hours of Lab or Studio per week**
15

### NURS 351 - Application of Intermediate Nursing Technologies

Credits: 1
Introduces intermediate nursing technologies and provides opportunities to apply these skills in simulated technology lab.

**Prerequisites**
NURS 309, 310, 319, 334, 425

**Hours of Lecture or Seminar per week**
0

**Hours of Lab or Studio per week**
2

### NURS 357 - Health Promotion and Disease Prevention in Medical/Surgical Nursing
NURS 347 - Health Promotion and Disease Prevention in Medical/Surgical Nursing
Credits: 2
Provides the student an opportunity to perform nursing care to medical surgical clients, including those who are culturally diverse and vulnerable and experiencing physiological, psychological, and social health problems in a variety of settings.

Prerequisites/Corequisites
NURS 347.

Notes
Enrollment is controlled.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
6

NURS 358 - Health Promotion and Disease Prevention in Maternal/Infant Nursing
Credits: 2
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.

Prerequisites/Corequisites
NURS 348

Notes
Enrollment is controlled.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
6

NURS 359 - Health Promotion and Disease Prevention in Pediatric Nursing
Credits: 2
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.

Prerequisites/Corequisites
NURS 349

Notes
Enrollment is controlled.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
6
NURS 388 - Problem-Based Clinical Inquiry

Credits: 3
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.

Prerequisites
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 400 - Clinical Nursing Elective

Credits: 3
Allows students to synthesize previously learned knowledge and skills, acquire additional clinical experience, and observe and participate in nursing practice.

Prerequisites
Satisfactory completion of all 300-level requirements.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
9

NURS 410 - Nursing Care of Clients with Pathological Conditions

Credits: 3
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.

Prerequisites
Completion of all junior year nursing courses

Corequisite
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
F
NURS 419 - Pathophysiological Basis for Nursing Care of Individuals and Small Groups II

Credits: 3
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.

Prerequisites
Completion of NURS 305, 309, 310, 319, and 334.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

NURS 425 - Comprehensive Health Assessment

Credits: 3
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
F, S

NURS 427 - Advanced Technologies for the Accelerated Pathway

Credits: 1
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.

Prerequisites
NURS 310 and 343.

Hours of Lecture or Seminar per week
1

Hours of Lab or Studio per week
2

NURS 428 - Community Health Clinical for the Accelerated Pathway
Credits: 2
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.

Prerequisites
NURS 436 and 440.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
6

NURS 429 - Preceptorship for the Accelerated Pathway
Credits: 3
Opportunity to deliver collaborative nursing care to culturally diverse and vulnerable populations.

Prerequisites
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 436 - Leadership and Management of Health Care
Credits: 3
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.

Prerequisites
Completion of all junior year nursing courses

Prerequisites/Corequisites

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0
When Offered
F, S
NURS 440 - Community Health and Epidemiology

Credits: 3
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.

Prerequisites
Senior standing.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0
When Offered
F, S

NURS 441 - Nursing of Clients in Communities and Large Groups

Credits: 5
Provides 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 illnesses.

Corequisite

Prerequisites/Corequisites
NURS 440 and 442.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
15
When Offered
F, S

NURS 442 - Case Studies in Community Health Nursing

Credits: 1
Examines the application of nursing care related to vulnerable and culturally diverse populations. Emphasis is on case studies, which include health promotion, disease prevention, cultural, political, ethical, and legal issues. Primary, secondary, and tertiary preventive concepts are applied.

Corequisite
NURS 441.

Notes
Seminar meets every other week for two hours.

Hours of Lecture or Seminar per week
1

Hours of Lab or Studio per week
0

**NURS 451 - Advanced Clinical Preceptorship**

Credits: 5
Opportunity to provide complex, collaborative nursing care to culturally diverse and vulnerable populations.

Corequisite
NURS 452, 455.

Prerequisites/Corequisites
Prerequisites or corequisites NURS 410 and 436

Notes
Concentrated clinicals available in selected institutional settings.

Hours of Lecture or Seminar per week
0

Hours of Lab or Studio per week
15

When Offered
F, S

**NURS 453 - Research in Nursing**

Credits: 3
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.

Prerequisites
Statistics.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

**NURS 455 - Advanced Technologies in Nursing**

Credits: 2
Opportunity to acquire advanced skills in nursing practice. Refinement of assessment skills associated with selected advanced technologies integrated into this laboratory course.
Corequisite
NURS 451.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
4

NURS 466 - Community Health Nursing

Credits: 2
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.

Prerequisites
Completion of all junior year nursing courses

Hours of Lecture or Seminar per week
2
Hours of Lab or Studio per week
0

NURS 467 - Clinical in Community Health Nursing

Credits: 2
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.

Prerequisites/Corequisites
NURS 466

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
6

NURS 468 - Psychiatric and Mental Health Nursing

Credits: 2
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.

Prerequisites
Completion of all junior year nursing courses
Notes
Open to traditional and LPN students only.

Hours of Lecture or Seminar per week
2

Hours of Lab or Studio per week
0

NURS 469 - Clinical in Psychiatric and Mental Health Nursing

Credits: 2
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.

Prerequisites/Corequisites
NURS 468

Hours of Lecture or Seminar per week
0

Hours of Lab or Studio per week
6

NURS 475 - Grand Rounds Complex Case Presentations

Credits: 3
Examines nursing implications of selected major health problems that significantly affect individuals throughout the life span. Focus is on complex health problems. Class meets once a week in the format of group presentations in the clinical setting.

Prerequisites
NURS 254, 262, 318, 319, 320, 419, 426, 430, 450, and 455.

Notes
Enrollment restricted to second degree students only.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

When Offered
SUM

NURS 487 - Principles, Concepts, and Techniques of Operating Room Nursing

Credits: 3
Prepares the registered nurse in basic principles and skills of operating room nursing. Learning environment is provided for registered nurse with no previous operating room experience to apply fundamental skills and knowledge of operating room
nursing in clinical practice. Based on the Association of Operating Room Nurses Standards and Recommended Practices and Guidelines.

**Prerequisites**
RN licensure, one year clinical experience, and letter of acceptance to six-month operating room clinical preceptorship.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**NURS 488 - Inquiry-Based Clinical Seminar**

Credits: 2
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.

**Prerequisites**
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
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.

**Prerequisites**

**Hours of Lecture or Seminar per week**
2

**Hours of Lab or Studio per week**
0

**NURS 492 - Death, Dying, and Decision Making**

Credits: 3
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 494 - Special Topics in Nursing

Credits: 3
Selected topics analyzing specialized areas in nursing.

Notes
Content varies. Lecture, seminar, laboratory, and workshops.

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
Examines literature on specialized topic in nursing practice, education, or scholarship. Readings conducted in consultation with faculty.

Prerequisites
Senior status or permission of school.

Notes
May be repeated for a maximum of 4 credits.

Hours of Lecture or Seminar per week
0

Hours of Lab or Studio per week
0

NURS 496 - Violence in Today's Society
Examines magnitude of problem of violence globally and more specifically within the United States. Discussion and reflective activities engage students in the learning process.

**NURS 499 - Independent Study in Nursing**

Credits: 1-3
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.

**Prerequisites**
Permission of college.

**Notes**
May be repeated for maximum 6 credits.

**NURS 505 - Case Management**

Credits: 3
Open to seniors. Survey course on state of case management programs and practice for health and human service professionals. Special emphasis on comparing the nature, process, and outcomes for baccalaureate and graduate students guided by the objectives.

**Prerequisites**
Bachelor's degree, or permission of instructor.

**NURS 508 - Psychopharmacology**

Credits: 3
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  
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)

**Prerequisites**  
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  
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 - Application of Advanced Health Assessment Methods**

Credits: 2  
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.

**Prerequisites**  
Undergraduate-level health assessment course for degree credit or approved CEU course.
NURS 530 - Nurses as Writers

Credits: 3
Focuses on theories and practices related to writing in nursing. Researching, composing, revising, and editing practiced in a variety of writing styles.

NURS 546 - Leadership Strategies in Health Policy

Credits: 3
Cross-Listed with GCH 546
Examines the leadership process from a policy and organizational perspective to expand students' ability to impact the health policy-making process.

Prerequisites
Graduate standing or permission of instructor

NURS 550 - Pathophysiologic Bases for Major Health Deviations of Individuals

Credits: 3
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.

NURS 556 - Principles of Assessment and Evaluation in Nursing Education
Credits: 3
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
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.

Prerequisites
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
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


Credits: 3
Cross-Listed with GCH 571

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.
NURS 580 - Operating Room—RN First Assistant

Credits: 3
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 581 - Operating Room—RN First Assistant Clinical Practicum

Credits: 3
Practicum course that prepares the RNFA to practice in an expanded clinical nursing role in the operating room. Based on the core curriculum of AORN. Individually designed practicum is taken after completion of NURS 580 to give the experienced operating room nurse 120 hours of practicum experience as a surgical first assistant working under the supervision of a surgeon preceptor.

Prerequisites
NURS 580, and operating room nursing experience.

Hours of Lecture or Seminar per week
1
Hours of Lab or Studio per week
2

NURS 582 - Nursing Care of Infants and Children

Credits: 3
Senior elective nursing course for students with specific interests in the field of pediatric nursing. Focuses on impact of illness and hospitalization on infants, children, and adolescents with emphasis on the family unit. Content builds on previous knowledge of pathophysiological, sociocultural, and risk reduction factors related to nursing care of infants, children, and adolescents.

Prerequisites
Junior nursing courses.

Corequisite
NURS 451 and 455.

Hours of Lecture or Seminar per week
NURS 585 - Entrepreneurship in Health Care

Credits: 3
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 586 - Parish Nursing I

Credits: 3
Students must be registered nurses. Introduces parish nursing as a developing specialty practice for professional nurses. Identifies basic skills for ministry in a faith community. Emphasizes scope of practice, various theological concepts for health ministry, and application of assessment skills to the faith community. Examines processes of case consultation and spiritual formation.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

NURS 587 - Parish Nursing II

Credits: 3
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.

Prerequisites
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: 3
Cross-Listed with GCH 594/HAP 594

Presents selected topics analyzing specialized areas in nursing.

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
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
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
Explores cross-cultural issues of health and illness from medical anthropology theory. Discusses cultural dimensions of developmental cycle and health care systems.
NURS 620 - Advanced Psychiatric/Mental Health Nursing

Credits: 3
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.

NURS 623 - Clinical Concepts in Community-Oriented Primary Care

Credits: 3
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.

Prerequisites
NURS 680.

NURS 630 - Acute Care Nursing for Advanced Practice

Credits: 3
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.

Prerequisites
Admission to the graduate program or permission of the instructor.
NURS 645 - Gerontological Nursing 1

Credits: 3
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.

Prerequisites
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
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.

Prerequisites
NURS 645.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

NURS 654 - Nursing Administration Financial Management

Credits: 3
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
S
NURS 660 - Seminar in the Ethics of Health Care

Credits: 3
Cross-Listed with PHIL 510

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.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

NURS 662 - Oncology Nursing: Clinical Concepts in Advanced Practice

Credits: 3

Focuses on advanced nursing practice for persons diagnosed with cancer and their families. Emphasizes physical symptoms, functional capacities, psychosocial disruptions, and knowledge deficits. Lecture.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

NURS 680 - Theoretical Foundations Related to Nursing

Credits: 2

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

Examines principles and methods of research in problem identification, theoretical framework, design, data collection, and analysis. Students develop a nursing research proposal.

Prerequisites
Admission to graduate nursing program and a bivariate statistics course and NURS 680.

Corequisite
Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

**NURS 686 - Projects in Nursing Research**

Credits: 2
Applies knowledge gained in NURS 790 to implement research proposal designed in NURS 790.

Prerequisites
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
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.

Prerequisites

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
Studies in-depth a selected area of nursing theory, research, or practice under direction of faculty.

Prerequisites
Admission to graduate nursing program, and permission of associate dean for academic programs.

Notes
May be repeated; maximum 6 total credits.
NURS 704 - Nursing Administrative Leadership Academy

Credits: 3
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 719 - Advanced Health Assessment

Credits: 2
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.

Prerequisites
Admission to a nursing concentration or permission of instructor

Notes
Course is offered through George Washington University and is charged at GWU tuition rates. Course meets at George Washington University. Students receive a Mason bill, but tuition is calculated at the George Washington 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
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.

Prerequisites
NURS 719, 723, 745, 747, 756.
Hours of Lecture or Seminar per week
2
Hours of Lab or Studio per week
6

NURS 721 - Practicum in Assessment and Management of the Developing Family

Credits: 8
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.

Prerequisites
NURS 720.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
15

NURS 722 - Practicum in Family Primary Care Nursing II

Credits: 8
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.

Prerequisites
NURS 721.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
5

NURS 723 - Clinical Decision Making

Credits: 2
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
NURS 756, admission to an NP concentration, or permission of instructor.
NURS 725 - Hermeneutic Research Methodologies in Health Care

Credits: 3
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.

Prerequisites/Corequisites
Graduate-level qualitative research course

NURS 726 - Perspectives in Nursing Education

Credits: 3
Uses seminar approach to provide an overview of nursing education. Provides the foundation for teaching and learning in nursing with emphasis on relevant research.

NURS 727 - Application of Nursing Education Principles to Curriculum and Program Development

Credits: 3
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.

Prerequisites
NURS 726.
NURS 728 - Practicum and Seminar in Nursing Education I

Credits: 3
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.

Prerequisites
Admission to graduate nursing program or post-master's status; NURS 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
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.

Prerequisites
Admission to graduate nursing program or post-master's status; NURS 727 and 728; 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
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.

Prerequisites/Corequisites
NURS 597 and 685

Hours of Lecture or Seminar per week
2
Hours of Lab or Studio per week
0
**NURS 731 - Clinical Nurse Leader Role Integration**

Credits: 2  
Explores roles, functions of clinical nurse leader in microsystem in health care arena. Uses seminar and clinical approaches to develop competence in clinical decision-making, critical thinking, problem identification, and outcome measurement for select client population at point of care.

**Hours of Lecture or Seminar per week**  
0  
**Hours of Lab or Studio per week**  
6

**NURS 732 - Clinical Nurse Leader Practicum**

Credits: 7  
Guided implementation of clinical nurse leader role in selected health care microsystem. Uses clinical and seminar approaches to acquire in-depth skills related to design, implementation, and evaluation of patient care. Focuses on accountability for coordination, delegation, and supervision of care provided by unit-based health care team.

**Hours of Lecture or Seminar per week**  
0  
**Hours of Lab or Studio per week**  
21

**NURS 733 - Introduction to Forensic Science**

Credits: 3  
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.

**Prerequisites**  
Admission to a graduate program or extended studies, or permission of the instructor.

**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  
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.
Prerequisites
Must be a registered nurse with a valid nursing license; NURS 733 or permission of instructor.

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
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.

Prerequisites
NURS 733 or permission of instructor.

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
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.

Prerequisites
NURS 733 or permission of instructor.

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
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.
Prerequisites
NURS 733 or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

**NURS 740 - Clinical Nurse Specialist Internship**

Credits: 3
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.

Prerequisites/Corequisites
NURS 775

Notes
This course may be taken twice.

Hours of Lecture or Seminar per week
0

Hours of Lab or Studio per week
9

**NURS 745 - Pharmacology**

Credits: 3
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**

Credits: 6
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.

**Prerequisites**
NURS 719, 723, 745, 747, 756

**Prerequisites/Corequisites**
NURS 623

**Hours of Lecture or Seminar per week**
2

**Hours of Lab or Studio per week**
12

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**NURS 747 - Pharmacology in Disease and Pathophysiology**

Credits: 1
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.

**Prerequisites**
Permission of instructor.

**Corequisite**
NURS 719.

**Notes**
Course is offered through George Washington University and charged at GWU tuition rates.

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**NURS 748 - Practicum in Adult Primary Care Nursing II**

Credits: 8
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.

**Prerequisites**
NURS 746.

**Hours of Lecture or Seminar per week**
2

**Hours of Lab or Studio per week**
16
NURS 751 - Primary Care of the Developing Family

Credits: 5
Post-master nurse practitioner course to introduce primary care nurse practitioner to knowledge and skills necessary to practice as a family nurse practitioner. Combines clinical experiences with instructional and informative family content, which focuses on primary care needs of the developing family. Provides theoretical and practical foundation for primary care nurse practitioners to expand their scope of practice to encompass family-based nursing. Participants collaborate with other students in group projects and web-based group discussions. Students broaden their knowledge through clinical experiences and clinical logs.

Prerequisites
National certification as adult nurse practitioner; and graduate-level advanced health assessment, pathophysiology, and pharmacology.

Notes
Taught through George Washington University Distance Learning.

Hours of Lecture or Seminar per week
5

Hours of Lab or Studio per week
0

NURS 752 - Advanced Family Primary Care

Credits: 8
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.

Prerequisites
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
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
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
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.

Prerequisites
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
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.

Prerequisites
Students must be enrolled in an NP concentration.

Corequisite
NURS 723.

Notes
Course is offered through George Washington University and charged at GWU tuition rates.

Hours of Lecture or Seminar per week
4

Hours of Lab or Studio per week
0
NURS 762 - Managed Care Concepts for Primary Care Practice

Credits: 1-4
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.

Prerequisites
Acceptance into nurse practitioner track, and permission of instructor.

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
Uses administrative theory and management principles and processes as related to roles and functions of the nurse in management in health-related agencies.

Prerequisites
Admission to graduate nursing program or master's degree

Prerequisites/Corequisites
NURS 680 and Management/Organizational Theory

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0
When Offered
F

NURS 765 - Practicum in Nursing Administration I

Credits: 3
Applies administrative theory and management principles and processes in a selected health-related agency. Roles and functions of the nurse in management are explored.

Prerequisites
Admission to graduate nursing program and NURS 680

Prerequisites/Corequisites
NURS 763

Notes
Lab arranged.
NURS 766 - Administrative Strategies in Nursing

Credits: 3
Explores roles and functions of the nurse in management as the nurse manager develops patterns of nursing care, articulating nursing education, and nursing service.

Prerequisites
NURS 763.

NURS 768 - Practicum in Nursing Administration II

Credits: 3
Implements and integrates roles and functions of the nurse in management. Emphasizes using appropriate management principles and processes in a selected health-related agency.

Prerequisites
NURS 763 and 765

Prerequisites/Corequisites
NURS 766

Notes
Lab arranged.

NURS 773 - Advanced Clinical Nursing I
Credits: 3
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.

Prerequisites/Corequisites
NURS 550 and 680

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

NURS 775 - Advanced Specialty Practice I

Credits: 3
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.

Prerequisites
Admission to graduate program and NURS 680.

Corequisite
NURS 773.

Hours of Lecture or Seminar per week
2

Hours of Lab or Studio per week
7

NURS 776 - Advanced Clinical Nursing II

Credits: 3
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.

Prerequisites
NURS 773.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

NURS 778 - Advanced Specialty Practice II

Credits: 3
Applies concepts of the advanced practice nursing role from NURS 776 to a selected clinical specialty.
Prerequisites
NURS 773 and 775.

Corequisite
NURS 776.

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
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).

Prerequisites
NURS 719, 723, 745, 747, 756.

Corequisite
NURS 746.

Hours of Lecture or Seminar per week
0

Hours of Lab or Studio per week
3

NURS 781 - Practicum in Gerontological Nursing II

Credits: 3
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).

Prerequisites
NURS 780

Corequisite
NURS 748.

Hours of Lecture or Seminar per week
0

Hours of Lab or Studio per week
3
NURS 804 - Advanced Quantitative Data Analysis for Health Care Research I

Credits: 3  
Cross-Listed with GCH 804

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.

Prerequisites  
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

Credits: 3  
Cross-Listed with GCH 805

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.

Prerequisites  
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  
Cross-Listed with GCH 806

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.

Prerequisites  
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
Cross-Listed with GCH 807

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.

Prerequisites
Doctoral-level course in research design and statistics; 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

NURS 808 - Translating Nursing and Health Care Research into Evidence-Based Policy

Credits: 3
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.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

NURS 809 - Research Design and Methods in Nursing and Health Care

Credits: 3
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.

Prerequisites
NURS 804 or equivalent advanced statistical course, NURS 955 or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0
NURS 810 - Evaluation Research in Nursing Education

Credits: 3
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.

Prerequisites/Corequisites
NURS 920 and 930

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

NURS 811 - Nurse as Educator and Scholar

Credits: 2
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.

Prerequisites
NURS 920 and 930.

Hours of Lecture or Seminar per week
2
Hours of Lab or Studio per week
0

NURS 820 - Human Genetics Concepts for Health Care

Credits: 4
The study of human genetics, principles of heredity, and disease risks.

Hours of Lecture or Seminar per week
4
Hours of Lab or Studio per week
0

NURS 855 - Ethics in Health Administration

Credits: 3
Cross-Listed with HHS 855

Philosophical foundations of health care ethics. Students analyze specific ethical dilemmas faced by administrators in health care.
settings.

**Prerequisites**
Admission to PhD program; for non-PhD students, permission of instructor.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

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**NURS 870 - Nursing and Health Care Administration I**

Credits: 3
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.

**Prerequisites**
Organization behavior course such as MGMT 600, PUAD 620, LRNG 700, or equivalent; and NURS 955.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

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**NURS 871 - Nursing and Health Care Administration II**

Credits: 2
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.

**Prerequisites**
NURS 870.

**Hours of Lecture or Seminar per week**
2

**Hours of Lab or Studio per week**
0

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**NURS 874 - Internship in Health Care Administration/Policy/Education**

Credits: 4
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.

**Prerequisites**
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: 1-3
Provides guided research experience of 45 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.

**Hours of Lecture or Seminar per week**
- 0

**Hours of Lab or Studio per week**
- 1-3

**NURS 880 - Informatics Inquiry for the Doctor of Nursing Practice**

Credits: 3
Introduces theoretical and practice components of nursing and health care informatics for the doctor of nursing practice (DNP). Health care data standards, classification schemes, and the electronic health record will be introduced. Students will evaluate informatics as it applies to quality improvement, outcomes measurement, complex decision making, consumer use, and legal and ethical issues. Students will analyze atomic and aggregate data to support practice, patient care, health education, and organizational management.

**Prerequisites**
Admission to the DNP program or by permission of instructor.

**Hours of Lecture or Seminar per week**
- 3

**Hours of Lab or Studio per week**
- 0

**NURS 881 - Issues and Methodologies in Translational Research**

Credits: 4
Build on knowledge of research methodologies to analyze the selection and evaluation of research underlying evidence-based practice. Apply research methodologies and strategies to examine and interpret population-based data sets. Explore models and the supporting research relating to the dissemination of knowledge and the translation of research practice. Determine the analytic approaches of relevance to translational research including interdisciplinary models. Address issues of measurement of quality health outcomes at the individual, family, system, and population level.

**Prerequisites**
Admission to the DNP program or by permission of instructor.
NURS 882 - Theoretical Foundations Related to Human Health Behaviors

Credits: 2
Explores and evaluates elements of selective behavioral and social science theories and models related to health risk behaviors and chronic disease management. Examines the impact of selected theories on advanced nursing practice. Applies behavioral change theory to the development of interventions for improvement in individual, organizational, and community health outcomes.

Prerequisites
Admission to the DNP program or by permission of instructor.

NURS 920 - Qualitative Research in Nursing and Health Care

Credits: 3
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.

Prerequisites
NURS 955

Prerequisites/Corequisites

NURS 925 - Methodological Issues in Nursing and Health Care Qualitative Research

Credits: 3
Explores, analyzes, and synthesizes conceptual, methodological, and ethical issues in qualitative research within the scholarship of discovery, integration, application, and teaching. Seminar.

Prerequisites
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

NURS 930 - Quantitative Methods in Nursing and Health Care

Credits: 3
Examination and application of principles in quantitative research in nursing and health care. Computer analysis of quantitative data will be required.

Prerequisites
NURS 955, 804, and 805.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

NURS 940 - Independent Study for the Doctoral Student

Credits: 1-6
Studies in depth a selected area of nursing theory, research, or practice under direction of faculty.

Prerequisites
Admission to a doctoral nursing program

Notes
May be repeated; maximum 6 credits.

Hours of Lecture or Seminar per week
0

Hours of Lab or Studio per week
0

NURS 950 - Special Topics in Nursing

Credits: 3
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
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.

Prerequisites
Admission to nursing doctoral program, or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

NURS 980 - Practice Inquiry I

Credits: 4
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.

Prerequisites
Completion of DNP core courses. A seminar for doctor of nursing practice (DNP) students to identify an area of practice inquiry.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
1

NURS 981 - Practice Inquiry II

Credits: 4
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.

Prerequisites
NURS 980.

Hours of Lecture or Seminar per week
2
Hours of Lab or Studio per week
2

NURS 998 - Doctoral Dissertation Proposal
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.

Prerequisites
Completion of all other course work except NURS 999; and completion of doctoral comprehensive examination.

Notes
May be repeated up to 12 credits.

NURS 999 - Doctoral Dissertation
Credits: 1-9
Provides continued faculty assistance on an individual basis toward completion of approved dissertation.

Prerequisites
NURS 998.

OM 210 - Statistical Analysis for Management
Credits: 4
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.

Prerequisites
C or higher in MATH 108 or MATH 113.

Corequisite
MIS 102.
When Offered
Fall, Spring, Summer.

OM 301 - Operations Management

Credits: 3
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.

Prerequisites
MIS 102, C or higher in OM 210, sophomore standing.

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
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.

Prerequisites
C or higher in OM 301, degree status.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

OM 352 - Methods and Models of Management Science

Credits: 3
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.

Prerequisites
C or higher in OM 301, degree status.

Hours of Lecture or Seminar per week
3
OM 435 - Business Process Analysis and Simulation

Credits: 3
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.

Prerequisites
C or higher in OM 301, degree status.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

OM 452 - Business Forecasting

Credits: 3
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.

Prerequisites
C or higher in OM 301, degree status.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

OM 456 - Quality Management

Credits: 3
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.

Prerequisites
C or higher in OM 301, degree status.

Hours of Lecture or Seminar per week

OM 462 - Honors Seminar in Operations Management

Credits: 3
Topic and format vary. In-depth study of a topic in the area of operations management. Enrollment limited and competitive.

Prerequisites
Senior standing, ISOM major, minimum GPA requirement.

OM 493 - Management of Technology Projects

Credits: 3
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.

Prerequisites
C or higher in OM 301, degree status.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

When Offered
Fall, Spring, Summer.

OM 499 - Independent Study in Operations Management

Credits: 1-3
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.

Prerequisites
C or higher in OM 301, degree status.

Hours of Lecture or Seminar per week
0

Hours of Lab or Studio per week
0

OR 335 - Discrete Systems Simulation Modeling
Credits: 3
Cross-Listed with SYST 335

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.

Prerequisites
CS 112 or grade of C or better in IT 103, 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
S

OR 441 - Deterministic Operations Research

Credits: 3
Cross-Listed with MATH 441

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.

Prerequisites
MATH 203, or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

When Offered
F, S

OR 442 - Stochastic Operations Research

Credits: 3
Cross-Listed with MATH 442

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.

Prerequisites
STAT 344 or STAT 346 or MATH 351, or equivalent.

Hours of Lecture or Seminar per week
3
**OR 481 - Numerical Methods in Engineering**

Credits: 3  
**Cross-Listed with MATH 446**

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.

**Prerequisites**
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**
F, S

**OR 498 - Independent Study in Operations Research**

Credits: 1-3  
Directed self-study of special topics of current interest in operations research.

**Prerequisites**
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**
0

**Hours of Lab or Studio per week**
0

**When Offered**
F, S, SUM

**OR 499 - Special Topics in Operations Research**

Credits: 3  
Topics of special interest to undergraduates.
Prerequisites
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

When Offered
F, S, SUM

OR 540 - Management Science

Credits: 3
Cross-Listed with SYST 540

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.

Prerequisites
MATH 108, and STAT 250 or OM 200; or equivalent.

Notes
OR/MS and SE/MS majors do not receive credit.

OR 541 - Operations Research: Deterministic Models

Credits: 3
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.

Prerequisites
MATH 203 or equivalent.

Notes
Students who have taken OR 441/MATH 441 will not receive credit.

Hours of Lecture or Seminar per week
OR 542 - Operations Research: Stochastic Models

Credits: 3

Prerequisites
STAT 344 or MATH 351, or equivalent.

Notes
Students who have taken OR 442/MATH 442 do not receive credit.

OR 574 - Quality Control and Process Management

Credits: 3

Cross-Listed with SYST 574

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.

Prerequisites
Graduate standing or permission of instructor.

OR 576 - Manufacturing Systems Analysis

Credits: 3
Cross-Listed with SYST 576

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.
Prerequisites
Graduate standing or permission of instructor.

OR 635 - Discrete System Simulation

Credits: 3
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.

Prerequisites
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
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, Stuckelberg-Cournot-Nash mathematical games and other classical nonconvex optimization problems.

Prerequisites
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
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.

Prerequisites
OR 541, or permission of instructor.

Hours of Lecture or Seminar per week

OR 642 - Integer Programming

Credits: 3
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.

Prerequisites
OR 541, or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

OR 643 - Network Modeling

Credits: 3
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.

Prerequisites
OR 541, or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

When Offered
F

OR 644 - Nonlinear Programming

Credits: 3
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.
Prerequisites
MATH 213 or equivalent, and OR 541; or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0
When Offered
S

**OR 645 - Stochastic Processes**

Credits: 3
Cross-Listed with STAT 645

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.

Prerequisites
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
F

**OR 647 - Queuing Theory**

Credits: 3

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.

Prerequisites
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
S
OR 648 - Production and Inventory Systems

Credits: 3
An analysis of production and inventory systems. Use of mathematical modeling for solutions of production planning and inventory control problems is introduced. Also included are stochastic inventory systems of lot sized-reorder type; periodic review and single-period models; application of dynamic programming theory to deterministic and stochastic cases; and static and dynamic production-planning models.

Prerequisites
OR 541 and 542, or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

OR 649 - Topics in Operations Research

Credits: 3
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.

Prerequisites
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
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
OR 541 or 542.

Hours of Lecture or Seminar per week
3
OR 652 - Military Operations Research Modeling II: Effectiveness Analysis

Credits: 3
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
OR 541 or 542.

OR 660 - Air Transportation Systems Modeling

Credits: 3
Cross-Listed with SYST 660

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.

Prerequisites
SYST 460/560, or permission of instructor.

OR 671 - Judgment and Choice Processing and Decision Making
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.

Prerequisites
STAT 510 or equivalent, or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

When Offered
F

OR 674 - Dynamic Programming

Credits: 3
Cross-Listed with SYST 674

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.

Prerequisites
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
Cross-Listed with STAT 678

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.

Prerequisites
STAT 544 or 554, or permission of instructor.

Hours of Lecture or Seminar per week
3
**OR 677 - Statistical Process Control**

Credits: 3  
**Cross-Listed with** STAT 677/SYST 677  
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.

**Prerequisites**  
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 680 - Project Course in Operations Research**

Credits: 3  
Capstone course for both the master's program in operations research and certificate in computational modeling. Can also be used in lieu of the project in master's program in systems engineering. Focus is on model development and implementation involved in the practice of operational modeling. Key activity is completion of a major applied group project. Work includes project proposal planning, completion, documentation, and presentation. To be taken in last spring semester of studies.

**Prerequisites**  
21 graduate credits in OR or SYST.

**Hours of Lecture or Seminar per week**  
3

**Hours of Lab or Studio per week**  
0

**OR 681 - Decision and Risk Analysis**

Credits: 3  
**Cross-Listed with** SYST 573  
Application of analytic reasoning and skills to practical problems in decisionmaking. Topics include problem structure, analysis and solution implementation, emphasizing contemporary approaches to decision analytic techniques.

**Prerequisites**  
OR 542 or MBA 638.
OR 682 - Computational Methods in Engineering and Statistics

Credits: 3  
**Cross-Listed with** CSI 700

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.

**Prerequisites**  
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  
**Cross-Listed with** SYST 680/ECE 670

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.

**Prerequisites**  
ECE 528, OR 542, or SYST 611; or equivalent.
OR 690 - Optimization of Supply Chains

Credits: 3
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.

Prerequisites
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 719 - Computational Models of Probabilistic Reasoning

Credits: 3
Cross-Listed with STAT 719/CSI 775

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.

Prerequisites
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

OR 735 - Advanced Stochastic Simulation

Credits: 3
Cross-Listed with IT 735/SYST 735

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 ariate generation, variance reduction techniques, sensitivity analysis and optimization of simulation models, distributed and parallel simulation, object-oriented simulation, and specialized applications.

Prerequisites
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

**OR 741 - Advanced Linear Programming**

Credits: 3
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.

**Prerequisites**
OR 541 and 641.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**OR 750 - Advanced Topics in Operations Research**

Credits: 3
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.

**Prerequisites**
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, Scheduling, and Network Design**
Introduces network and combinatorial optimization problems in logistics, computer science, electrical engineering, and systems engineering. Solution techniques for various classes of such problems are developed. Topics include scheduling algorithms, capital budgeting, minimal cost network flow, optimal routings, and generalized networks. Scheduling algorithms, network reliability, stochastic networks, and combinatorially based network problems are discussed.

**Prerequisites**
OR 642, 643, or 690.

**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

*Cross-Listed with* IT 763/SYST 763

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.

**Prerequisites**
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

*Cross-Listed with* IT 774

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.

**Prerequisites**
OR674/SYST674 or permission of instructor.

**OR 780 - Queuing Modeling of Computer-Communication Networks**
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.

Prerequisites
OR 645 or 647, or ECE 542; or equivalent.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

OR 782 - Advanced Topics in Combinatorial Optimizations

Credits: 3
Cross-Listed with IT 782

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.

Prerequisites
OR 641 and 642.

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 783 - Advanced Topics in Network Optimization

Credits: 3
Cross-Listed with IT 783

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.

Prerequisites
OR 643.
OR 784 - Advanced Topics in Nonlinear Programming

Credits: 3
Cross-Listed with IT 784

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.

Prerequisites
OR 644.

Notes
May be repeated for credit when topics are distinctly different.

OR 842 - Models of Probabilistic Reasoning

Credits: 3
Cross-Listed with IT 842, SYST 842

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.

Prerequisites
STAT 544 or OR 681, or permission of the instructor.

OR 888 - Distributed Estimation and Multisensor Tracking and Fusion

Credits: 3
Cross-Listed with SYST 888/IT 888/ECE 753

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.

**Prerequisites**
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

**Cross-Listed with** IT 944, SYST 944

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.

**Prerequisites**
IT 842 or permission of instructor.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**OR 981 - Optimization in Medicine**

Credits: 3

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.

**Prerequisites**
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

**PHED 102 - Introduction to Soccer**
This course is designed to introduce individuals to the basic elements of soccer. This includes dribbling, kicking, passing, trapping, tactics, and strategy.

**PHED 103 - Fencing I**

Credits: 1  
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.

**PHED 105 - Aerobics and Basic Conditioning**

Credits: 1  
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).

**PHED 107 - Social Dance**

Credits: 1  
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.
PHED 108 - Weight Training and Body Conditioning

Credits: 1
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
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
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 114 - Social Dance II

Credits: 1
Provides a review of dance fundamentals and dance patterns of the five dances learned in PHED 107 Social Dance. Builds on social dance by offering two additional dance patterns in each of the five dances and adding a sixth dance, the tango, to improve and expand students' dancing skills.

Hours of Lecture or Seminar per week
1
Hours of Lab or Studio per week
0

PHED 118 - Advanced Life Guarding

Credits: 1
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.

Prerequisites
PHED 150 or permission of instructor

Hours of Lecture or Seminar per week
1
Hours of Lab or Studio per week
0

PHED 127 - Social Dance II

Credits: 1
Provides an introduction to the tango and additional patterns for the fox trot, waltz, cha-cha, rumba, and Eastern swing.

Prerequisites
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
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.
Prerequisites
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
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
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.

Prerequisites
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 134 - Self-Defense for Men and Women

Credits: 1
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.
PHED 135 - Self-Defense for Men and Women II

Credits: 1
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.

Prerequisites
PHED 134

Notes
Fee required.

PHED 136 - Tae Kwon Do

Credits: 1
A beginner-level course designed to develop basic skills of Tae Kwon Do, a Korean martial art that predominantly emphasizes kicking.

Notes
Fee required.

PHED 137 - Intermediate Tae Kwon Do

Credits: 1
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.

Prerequisites
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
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
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.

**Prerequisites**
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
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
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.

Prerequisites
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
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
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
PHED 147 - Advanced Tae Kwon Do

Credits: 2
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.

Prerequisites
PHED 137 or permission of instructor

Hours of Lecture or Seminar per week
2

Hours of Lab or Studio per week
0

PHED 149 - Tai Chi

Credits: 1
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 T'ai Chi Chih ® movements.

Hours of Lecture or Seminar per week
1

Hours of Lab or Studio per week
0

PHED 150 - Intermediate Swimming

Credits: 1
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.

Hours of Lecture or Seminar per week
1

Hours of Lab or Studio per week
0

PHED 151 - Introduction to Tennis
Credits: 1
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.

**Hours of Lecture or Seminar per week**
1

**Hours of Lab or Studio per week**
0

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**PHED 153 - Intermediate Tennis**

Credits: 1
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.

**Prerequisites**
PHED 151 or demonstrated ability

**Hours of Lecture or Seminar per week**
1

**Hours of Lab or Studio per week**
0

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**PHED 155 - Introduction to Springboard Diving**

Credits: 2
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.

**Prerequisites**
PHED 150 or permission of instructor

**Hours of Lecture or Seminar per week**
2

**Hours of Lab or Studio per week**
0

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**PHED 156 - Intermediate Springboard Diving**

Credits: 2
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.
Prerequisites
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
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
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.

Prerequisites
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

Credits: 1
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.
Prerequisites
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
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.

Prerequisites
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
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
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.
PHED 164 - Intermediate Karate

Credits: 1
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.

Prerequisites
PHED 163 or permission of instructor

PHED 165 - Introduction to Racquetball

Credits: 1
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.

PHED 166 - Intermediate Racquetball

Credits: 1
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.

Prerequisites
PHED 165 or permission of instructor
PHED 167 - Advanced Concepts and Strategies in Bowling

Credits: 1
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.

Prerequisites
PHED 162 or permission of instructor

Hours of Lecture or Seminar per week
1

Hours of Lab or Studio per week
0

PHED 168 - Introduction to Basketball

Credits: 1
This course is designed to introduce individuals to the basic elements of basketball. This includes dribbling, passing, shooting, tactics, and strategy.

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
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.

Prerequisites
PHED 145

Hours of Lecture or Seminar per week
2

Hours of Lab or Studio per week
0

PHED 200 - Professional Dimensions of Health, Recreation, and Physical Education

Credits: 3
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
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
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
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
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.
Prerequisites
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
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
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 to BPRE and BSED PHED majors only.

Hours of Lecture or Seminar per week
0

Hours of Lab or Studio per week
2

PHED 274 - Dance and Educational Gymnastics

Credits: 2
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
0
Hours of Lab or Studio per week
2

PHED 275 - Field and Invasion Games

Credits: 2
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
0
Hours of Lab or Studio per week
2

PHED 300 - Kinesiology

Credits: 3
Covers anatomical and mechanical study of human movement.

Prerequisites
BIOL 124

Corequisite
BIOL 125

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

PHED 304 - Sport, Culture, and Society

Credits: 3
Analyzes sport from educational, political, economic, and cultural perspectives.

Prerequisites
PHED 200 or permission of instructor

Hours of Lecture or Seminar per week
PHED 306 - Psychomotor Learning

Credits: 3
Analyzes psychological aspects, learning theory, and practice conditions for learning motor skills.

Prerequisites
BSED status

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

PHED 308 - Adapted Physical Education

Credits: 3
Introduces disabilities in public schools. Covers national standards, federal legislation, IEPs, and developmental inclusion models.

Prerequisites
BSED status, and BIOL 124 and 125

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

PHED 364 - Strength Training: Concepts and Applications

Credits: 3
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.

Prerequisites
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
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.

Prerequisites
BIOL 124 and 125

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

PHED 403 - Elementary School Instruction in Physical Education

Credits: 3
Covers content, knowledge, and teaching methods for K-6 physical education. Requires field experience.

Prerequisites
PHED 201, 202, 273, 274, 275, and 306; and BSED status

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

PHED 404 - Middle and High School Instruction in Physical Education

Credits: 3
Examines school curriculum, assessment, content, and teaching practices for middle and high school physical education programs. Requires field experience.

Prerequisites
PHED 201, 202, 273, 274, 275, 306, and 403; and BSED status

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

PHED 410 - Social/Psychological Aspects of Health and Fitness

Credits: 3
Covers research, trends, and techniques of health and fitness from a behavioral perspective.
PHED 415 - Student Teaching in Physical Education

Credits: 12
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.

Prerequisites
Completion of all courses in approved program, and acceptance into student teaching

PHED 442 - Practicum in Physical Education

Credits: 1-3
Provides supervised professional practice in a selected area of interest.

Prerequisites
90 credits, or 60 credits 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 450 - Physiology of Exercise

Credits: 4
Covers human physiological responses to environmental changes and exercise.

Prerequisites
BIOL 124 and 125, and PHED 300

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**Hours of Lab or Studio per week**

1

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**PHED 480 - Special Topics**

Credits: 3
See course description in the Schedule of Classes. Selected topics reflect interest in specialized areas of exercise science or health promotion.

**Prerequisites**
60 credits

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**PHED 499 - Independent Study in Physical Education and Fitness**

Credits: 1-3
Study of a problem area in physical education research, theory, or practice under direction of faculty member.

**Prerequisites**
90 credits and permission of instructor

**Notes**
May be repeated, but no more than 3 total credits may be earned.

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**PHED 670 - Analysis of Teaching in Physical Education**

Credits: 3
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.

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**PHED 672 - Curriculum and Assessment in Physical Education**
Credits: 3
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.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

PHED 673 - Motor Development for Special Populations

Credits: 3
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.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

PHED 680 - Mentoring and Supervising in Physical Education

Credits: 3
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.

Prerequisites
PHED 670

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

PHIL 100 - Introduction to Philosophy

Credits: 3
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 111 - Individual and Society

Credits: 3
Examines philosophical issues revolving around the relationship between the individual and society, drawing from Plato, Hobbes, Locke, Rousseau, and Marx. Issues include the concept of individual rights, the legitimacy of political authority, and the competing demands of individual liberty, equality, and the common good.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

PHIL 112 - Ethics and the Cybersociety

Credits: 1
Examines ethical issues associated with new developments in information technology, including privacy rights, intellectual property rights, and the effect of information technology on society.

Hours of Lecture or Seminar per week
1

Hours of Lab or Studio per week
0

PHIL 151 - Introduction to Ethics

Credits: 3
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
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.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0
PHIL 173 - Logic and Critical Thinking

Credits: 3
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 180 - Logic and Law

Credits: 3
What are the standards of reasoning that guide decision-making in the law? This question draws attention to the criteria for a sound argument, a topic that is central to logic. Students examine how lawyers rely on such criteria to persuade jurors of the merits of their case. Standards of reasoning associated with work of jurors also examined.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

PHIL 253 - Philosophy and Literature

Credits: 3
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.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

PHIL 254 - Contemporary Ethical Problems

Credits: 3
Topics include homosexuality, abortion, drugs, civil disobedience, capital punishment, and rights of individual versus the rights of society.

Hours of Lecture or Seminar per week
3
PHIL 301 - History of Western Philosophy: Ancient

Credits: 3
Classical Greek philosophy, including pre-Socratics, Socrates, Plato, and Aristotle.

PHIL 302 - History of Western Philosophy: Medieval

Credits: 3
Figures and problems of medieval philosophy. Study of leading thinkers from the 5th to the 15th centuries.

PHIL 303 - History of Western Philosophy: Modern

Credits: 3
Figures and problems of modern philosophy. Study of philosophers such as Descartes, Locke, Berkeley, Hume, Kant, and Hegel.

PHIL 305 - Business Ethics

Credits: 3
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.
PHIL 306 - Business Ethics Internship

Credits: 1
Working independently or in teams, students participate in evaluation of organizations nominated for National Capitol Business Ethics Award. With no scheduled class meetings but working with the professor, students learn ethical standards and practices for business and how ethics can be incorporated into organizational culture. They gain understanding of ethics codes, leadership skills that develop ethical behavior, and management techniques that support an ethical environment in business.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
0

PHIL 309 - Bioethics

Credits: 3
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.

Prerequisites
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
Investigation of theories of natural law, legal positivism, and legal realism as they pertain to some of the central philosophical questions about law.

Prerequisites
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
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.

**Prerequisites**
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
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.

**Prerequisites**
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**

Credits: 3
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.

**Prerequisites**
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
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.

**Prerequisites**
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
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.

**Prerequisites**
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
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 of this course will 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.

**Prerequisites**
GOVT 101, or 3 credits of philosophy.

**Notes**
This course can be retaken for credit when the subject matter is different.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**PHIL 332 - Twentieth-Century Analytic Philosophy**

Credits: 3
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.

**Prerequisites**
3 credits of logic and PHIL 303, or permission of instructor.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

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**PHIL 335 - Nineteenth-Century Philosophy**

Credits: 3
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.

**Prerequisites**
3 credits of philosophy, or permission of instructor.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

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**PHIL 336 - Twentieth-Century Continental Thought: Existentialism**

Credits: 3
Examination of existential philosophy from its 19th-century origins to its 20th-century expressions. Philosophers studied include Kierkegaard, Nietzsche, Sartre, De Beauvoir, and Buber.

**Prerequisites**
3 credits of philosophy, or permission of instructor.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
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**PHIL 337 - Twentieth-Century Continental Thought: Phenomenology**

Credits: 3
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.

**Prerequisites**
PHIL 338 - Woman: The Philosophical Questions

Credits: 3
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.

Prerequisites
3 credits of philosophy, or permission of instructor.

PHIL 340 - Hermeneutic Philosophy

Credits: 3
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.

Prerequisites
3 credits of philosophy, or permission of instructor.

PHIL 343 - Issues in Environmental Ethics

Credits: 3
Philosophical examination of issues in environmental ethics, such as moral status of animals, moral significance of nature, duties to protect wilderness areas, economics and environment protection, and environmental justice.

Prerequisites
Completion or concurrent enrollment in all other required general education courses.
PHIL 349 - Christian Ethics

Credits: 3
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.

PHIL 351 - Philosophy Business Ethics Internship

Credits: 3
This internship will develop self-directed learning skills in which the student will gain a better understanding and appreciation of both ethics and its application in the business world. Students will learn appropriate ethical standards for business; develop an appreciation of the need for an ethical culture; and experience the day-to-day activities of a business organization where they learn how ethics is incorporated into the culture. Students will gain understanding of ethics codes, leadership skills that rely on ethics, and management techniques that encourage and support an ethical environment in business.

PHIL 355 - Theories of Ethics

Credits: 3
A critical examination of a variety of different types of classical, modern, and contemporary ethical theories, including consequentialist theories, deontological theories, and virtue theories.

Prerequisites
Three credits in philosophy or permission of instructor.
PHIL 356 - Philosophy of Art

Credits: 3
Basic problems that arise from an inquiry into meaning and value of art and our response to art.

Prerequisites
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
Cross-Listed with SOCI 599

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.

Prerequisites
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
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?

Prerequisites
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 372 - Philosophical Methods

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Study of the relationship between a philosopher's method, doctrine, and concept of truth. Philosophers studied vary but include representatives from among the empirical, analytical, phenomenological, hermeneutical, and structuralist movements.

**Prerequisites**
3 credits of philosophy, or permission of instructor.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

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**PHIL 373 - Theory of Knowledge**

Credits: 3
Discussion of basic problems concerning the nature of knowledge, with study of the relation of knowledge to perception, belief, and language.

**Prerequisites**
3 credits of philosophy, or permission of instructor.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

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**PHIL 374 - Philosophy of Mind**

Credits: 3
Investigation of such theories as dualism, behaviorism, and materialism as they pertain to some of the central philosophical questions about mind.

**Prerequisites**
3 credits of philosophy, or permission of instructor.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
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**PHIL 375 - Metaphysics**

Credits: 3
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.
Prerequisites
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
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.

Prerequisites
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

Credits: 3
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.

Prerequisites
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
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.

Prerequisites
Completion or concurrent enrollment in all other required general education courses, or permission of instructor.

Hours of Lecture or Seminar per week
PHIL 391 - Special Topics in Philosophy

Credits: 3
Examines topics of current interest, such as death and dying, rights of children, or philosophical controversies in modern physics.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

PHIL 392 - Special Topics in Philosophy

Credits: 3
Examines topics of current interest, such as death and dying, rights of children, or philosophical controversies in modern physics.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

PHIL 421 - Seminar

Credits: 3
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.

Prerequisites
9 credits in philosophy.

Notes
May be repeated for credit.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

PHIL 422 - Honors Seminar
Seminar for students enrolled in the honors program in philosophy.

**Prerequisites**
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

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**PHIL 425 - Independent Study**

Credits: 3

**Prerequisites**
60 credits, including 15 credits in philosophy and permission of department.

**Notes**
May be repeated for credit.

**Hours of Lecture or Seminar per week**
0

**Hours of Lab or Studio per week**
0

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**PHIL 427 - Feminist Political Thought**

Credits: 3

Explores feminist political thought in historical context. Topics include feminist political movements, feminist critiques of political philosophy, and feminist contributions to political theory.

**Prerequisites**
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

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**PHIL 428 - Advanced Democratic Theory**

Credits: 3

**Cross-Listed with** GOVT 428

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.
Prerequisites
GOVT 101 or one course in philosophy.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

PHIL 429 - International Ethics

Credits: 3
Examines key value issues in international affairs, including global justice and poverty, human rights and the extension of democracy, and preservation of environment in view of economic globalization, persistence of nationalism, and new forms of war and terrorism.

Prerequisites
Course in philosophy, or GOVT 101.

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
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.

Prerequisites
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
Honors version of PHIL 470.

Prerequisites
9 credits in philosophy and acceptance to the honors program in philosophy.

Hours of Lecture or Seminar per week
PHIL 510 - Seminar in Ethics of Health Care

Credits: 3
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.

Prerequisites
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
A study of the central issues in the philosophy of Plato through a close reading of selected dialogues. Issues investigated will include the questions of the possibility of knowledge, the nature of being, and of the good.

Prerequisites
Graduate standing.

Notes
May be repeated for credit.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

PHIL 603 - Aristotle: Selected Works

Credits: 3
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.

Prerequisites
Graduate standing.

Notes
May be repeated once with permission of department when topics and readings differ significantly.
PHIL 604 - Augustine and Aquinas

Credits: 3
Critical examination of philosophies of Augustine and Aquinas with special attention to the mode of argument of each.

Prerequisites
Graduate standing.

PHIL 605 - Mind-Body Problem in Early Modern Philosophy

Credits: 3
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.

Prerequisites
Graduate standing.

PHIL 608 - Hegel's Phenomenology of the Spirit

Credits: 3
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.

Prerequisites
Graduate standing.
PHIL 611 - Philosophy of Law

Credits: 3
Examines major jurisprudential theories that underpin law in Western society. After examining the theories, students apply them to contemporary social and political problems.

Prerequisites
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
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."

Prerequisites
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
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.

Prerequisites
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
Explores themes, movements, and periods in the history of political theory.

**Prerequisites**
Graduate standing.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**PHIL 618 - Contemporary French Feminism**
Credits: 3
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.

**Prerequisites**
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
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.

**Prerequisites**
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
Explores philosophical aspects of Freud's thought, focusing on Freud's philosophy of human nature and culture, and influence on contemporary thought.

**Prerequisites**
6 credits of philosophy, course in personality theory, or permission of instructor.
PHIL 632 - Twentieth-Century Logical Positivism

Credits: 3
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.

Prerequisites
Graduate standing.

PHIL 640 - History of Ethical Theory

Credits: 3
Examines history of Western ethical theory from ancient Greece to the present day, including virtue theory, consequentialism, deontological theory and contemporary feminism.

Prerequisites
Graduate standing.

PHIL 641 - Ethics and the Professions

Credits: 3
A philosophical analysis of the concept of profession as a category of the world of work. Professional codes of ethics are examined to determine their effectiveness as guides for professional conduct.

Prerequisites
Graduate standing, or permission of instructor.
PHIL 642 - Biomedical Ethics

Credits: 3
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.

Prerequisites
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
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.

Prerequisites
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
Examines organizational culture as necessary for ethical development and of the application of ethics in business and organizational settings.

Prerequisites
Graduate standing.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0
PHIL 645 - Research Ethics

Credits: 3
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
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.

Prerequisites
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
Analysis of the critique of patriarchy offered by contemporary continental feminist philosophers. Examines contemporary moral, political, and epistemological issues in feminist theory.

Prerequisites
Graduate standing, or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

PHIL 673 - Current Issues in Theory of Knowledge

Credits: 3
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.

**Prerequisites**
Graduate standing.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**PHIL 681 - Philosophical Figures**

Credits: 3
Examines major philosophical authors of crucial philosophical texts and their influence on philosophical thought.

**Prerequisites**
Graduate standing.

**Notes**
May be repeated for maximum 6 credits.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**PHIL 691 - Special Topics in Philosophy**

Credits: 1-6
Topics vary.

**Prerequisites**
Graduate standing, or permission of instructor.

**Notes**
May be repeated for credit.

**Hours of Lecture or Seminar per week**
1-6

**Hours of Lab or Studio per week**
0

**PHIL 693 - Directed Readings in Philosophy**

Credits: 3
Directed readings and research on specific topic in philosophy chosen by student and instructor.
Notes
May be repeated for maximum 6 credits.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
0

PHIL 719 - Phenomenology of World

Credits: 3
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.

Prerequisites
Previous course in phenomenology, or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

PHIL 720 - Nietzsche and his Readers

Credits: 3
Reading of major texts of Nietzsche and some of his most influential interpreters and critics.

Prerequisites
Graduate standing.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

PHIL 721 - Advanced Seminar in Philosophy

Credits: 3
Close study of selected topics in current philosophical discourse.

Prerequisites
Graduate standing.

Notes
May be repeated for credit.
PHIL 733 - Current Issues in Cognitive Science

Credits: 3
Examines current areas of investigation in cognitive science and philosophy of mind, such as nature of consciousness, and representational and connectionist theories of mind.

Prerequisites
Admission to master's program in philosophy or permission of instructor.

Notes
May be repeated for credit.

PHIL 799 - Thesis

Credits: 1-6
Develop research and write an original thesis under the direction of their thesis director.

Prerequisites
Completion of 24 credits, approval of the thesis proposal, and permission of instructor (thesis director).

PHYS 101 - Light and Sound in Our World

Credits: 3
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.
PHYS 102 - Sports Physics

Credits: 3
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

Credits: 4
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.

Notes
For nonscience 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
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.

Prerequisites
PHYS 103 or permission of instructor.

Notes
For nonscience majors.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
3

PHYS 121 - Uses of Physics
Credits: 1
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
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
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**

Credits: 1
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
0
**PHYS 160 - University Physics I**

Credits: 3
First semester of three-semester, calculus-based introductory physics sequence, designed primarily for science and engineering majors. Mechanics.

Corequisite
MATH 114.

**PHYS 161 - University Physics I Laboratory**

Credits: 1
Experiments in mechanics, including techniques for recording, graphically and statistically analyzing, and reporting data.

Corequisite
PHYS 160 and MATH 114

**PHYS 225 - Problems in Physics I**

Credits: 1-3
Individual study of physics problems of current interest.

Prerequisites
24 credits and 2.50 GPA in physics and mathematics.

Notes
May be taken three times for credit.
PHYS 243 - College Physics

Credits: 3
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.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

PHYS 244 - College Physics Lab

Credits: 1
Laboratory portion of two-semester basic physics course.

Corequisite
PHYS 243 for 244, and 245 for 246.

Hours of Lecture or Seminar per week
0

Hours of Lab or Studio per week
3

PHYS 245 - College Physics

Credits: 3
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.

Prerequisites
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
Laboratory portion of two-semester basic physics course.

Corequisite
PHYS 243 for 244, and 245 for 246.
PHYS 251 - Introduction to Computer Techniques in Physics

Credits: 3
Introduction to using computers in physics based on examples from mechanics and astronomy.

Prerequisites
PHYS 160.

PHYS 260 - University Physics II

Credits: 3
Waves, electricity, and magnetism.

Prerequisites
PHYS 160 with grade of C or better (2.00)

Corequisite
MATH 213

PHYS 261 - University Physics II Laboratory

Credits: 1
Experiments in mechanics, electricity, and magnetism, including techniques for recording, graphically and statistically analyzing, and reporting data.

Prerequisites
PHYS 161

Corequisite
MATH 213 and PHYS 260
PHYS 262 - University Physics III

Credits: 3
Thermodynamics, optics, and modern physics.

Prerequisites
PHYS 260 with grade of C or better (2.00)

Corequisite
MATH 214

PHYS 263 - University Physics III Laboratory

Credits: 1
Experiments in optics and modern physics, including techniques for recording, graphically and statistically analyzing, and reporting data.

Prerequisites
PHYS 261

Corequisite
PHYS 262

PHYS 265 - Advanced University Physics II Laboratory

Credits: 2
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
MATH 213 and PHYS 260.
**PHYS 266 - Introduction to Thermodynamics**

Credits: 1  
Students may not receive credit for both PHYS 262 and 266. Laws of thermodynamics, kinetic theory of gases, heat engines, and entropy.

**Prerequisites**  
PHYS 260.

**PHYS 303 - Classical Mechanics**

Credits: 3  
Motion of a particle in one, two, and three dimensions; systems of particles; noninertial coordinate systems; and equations of Lagrange and Hamilton.

**Prerequisites**  
PHYS 262 and MATH 214 or permission of instructor.

**PHYS 305 - Electromagnetic Theory**

Credits: 3  
**Cross-Listed with** ECE 305  
Interaction of static charges, interaction of stationary currents, electromagnetic induction, and Maxwell's equations.

**Prerequisites**  
PHYS 260  
**Corequisite**  
MATH 214  

**Hours of Lecture or Seminar per week**  
1

**Hours of Lab or Studio per week**  
0
PHYS 306 - Wave Motion and Electromagnetic Radiation

Credits: 3
Vibrating string, plane waves, interference, diffraction, polarization, electromagnetic waves, dispersion, and relativity.

Prerequisites
PHYS 262

Corequisite
MATH 214.

PHYS 307 - Thermal Physics

Credits: 3
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.

Prerequisites
PHYS 262.

PHYS 308 - Modern Physics with Applications

Credits: 3
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.

Prerequisites
PHYS 262

Corequisite
MATH 214
PHYS 310 - Physics of Semiconductor Materials and Processing

Credits: 3
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.

Prerequisites
PHYS 160, 260, and 262; or permission of instructor.

PHYS 326 - Problems in Physics II

Credits: 1-3
Individual study of physics problems of current interest.

Notes
May be taken three times for credit.

PHYS 328 - Introduction to Astrophysics

Credits: 3
Cross-Listed with ASTR 328

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.

Prerequisites
PHYS 262 and MATH 214.
**PHYS 331 - Physics of Renewable Energy**

Credits: 3  
introduces the physical principles 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 also useful for students majoring in science policy, business, global change and sustainable development.

**Prerequisites**  
PHY 262, 266, or PHYS 245 with a C or better in MATH 113.

**Notes**  
This course counts toward the required 45 hours of upper division hours, but it does not count toward the requirement for a minimum of 12 upper-level credits for physics majors.

**PHYS 370 - Molecular Biophysics**

Credits: 3  
Cross-Listed with BINF 470  
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.

**Prerequisites**  
PHY 307, or CHEM 331 and CHEM 332, or permission of instructor

**PHYS 385 - Materials Science with Applications to Renewable Energy**

Credits: 3  
Cross-Listed with CDS 385  
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.

Prerequisites
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

PHYS 390 - Topics in Physics

Credits: 1-4
Selected topics in physics not covered in fixed-content courses.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
0

PHYS 402 - Introduction to Quantum Mechanics and Atomic Physics

Credits: 3
Cross-Listed with PHYS 502
Experimental basis of quantum mechanics; the wave function; systems in one, two, and three dimensions.

Prerequisites
PHYS 308, or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

PHYS 405 - Honors Thesis in Physics

Credits: 3
Project chosen and completed under the guidance of a faculty member, which results in a thesis.

Prerequisites
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.
PHYS 406 - Honors Thesis in Physics

Credits: 3
Project chosen and completed under the guidance of a faculty member, which results in a thesis.

Prerequisites
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.

PHYS 407 - Senior Laboratory in Modern Physics

Credits: 3
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.

Prerequisites
21 credits of physics courses, including PHYS 305 and 308

Notes
This course meets the writing-intensive requirement.

PHYS 408 - Senior Research

Credits: 2-3
Work under guidance of faculty member on research project in experimental or theoretical physics.

Prerequisites
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
0
Hours of Lab or Studio per week
0

PHYS 409 - Physics Internship

Credits: 3
On-the-job experience for physics majors in industry or government laboratories including summer programs.

Prerequisites
75 credits, 21 credits of physics courses, and permission of department.

Notes
See department for other requirements and application procedures prior to enrollment. Students may receive no more than 6 credits of PHYS 405, 406, 408, and 409.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
0

PHYS 410 - Computational Physics I

Credits: 3
Cross-Listed with PHYS 510

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.

Prerequisites
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
Crystal structures, binding, lattice vibrations, the free electron model, metals, semiconductors and semiconductor devices, superconductivity, and magnetism.

Prerequisites
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
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.

Prerequisites
21 credits of physics courses.

Hours of Lecture or Seminar per week
2
Hours of Lab or Studio per week
0

PHYS 417 - Geophysics

Credits: 3
Cross-Listed with GEOL 417

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.

Prerequisites
GEOL 101, 102, 201, 301; MATH 113, 114; and PHYS 160.

Corequisite
MATH 213 and PHYS 260, 261.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0
PHYS 428 - Relativity and Cosmology

Credits: 3
Cross-Listed with ASTR 428

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.

Prerequisites
MATH 214; and 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

PHYS 440 - Nuclear and Particle Physics

Credits: 3

Cross-Listed with PHYS 540

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.

Prerequisites
PHYS 402 or 502.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

PHYS 475 - Atmospheric Physics

Credits: 3
Cross-Listed with PHYS 575/CSI 655

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.

Prerequisites
PHYS 260, 262, and 305 or equivalent.

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
Cross-Listed with PHYS 402

Experimental basis of quantum mechanics, the wave function, and systems in one, two, and three dimensions.

Prerequisites
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
Cross-Listed with PHYS 410

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.

Prerequisites
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**

Credits: 3
Cross-Listed with PHYS 412/CSI 687

Crystal structures, binding, lattice vibrations, the free electron model, metals, semiconductors and semiconductor devices, superconductivity, and magnetism.
Prerequisites
PHYS 402 or 502.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

PHYS 513 - Applied Electromagnetic Theory

Credits: 3
Classical electromagnetic theory with applications. Topics include electrostatics, magnetic fields and materials, electromagnetic wave propagation, waveguides, transmission lines, radiation, and antennas.

Prerequisites
PHYS 305, 306; and MATH 313, 314 or equivalent.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

PHYS 533 - Modern Instrumentation

Credits: 3
Cross-Listed with CHEM 620

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.

Prerequisites
PHYS 513 and an electronics course

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

PHYS 540 - Nuclear and Particle Physics

Credits: 3
Cross-Listed with PHYS 440

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.
PHYS 575 - Atmospheric Physics I

Credits: 3
Cross-Listed with PHYS 475/CSI 655

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.

PHYS 590 - Selected Topics in Physics

Credits: 1-6
Selected topics from recent theoretical or experimental developments and applications. Satisfies needs of professional community to keep abreast of current developments.

PHYS 600 - Special Topics in Physics

Credits: 1-6
In-service course to strengthen and update teachers' knowledge of physics and astronomy.
PHYS 611 - Electro-optics

Credits: 3
Optical modulators, display devices, types and operation of lasers, mode locking, Q-switching, photodetectors, optical fibers.

Prerequisites
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
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.

Prerequisites
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
Cross-Listed with CSI 780

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.

Prerequisites
PHYS 303, 305, and 510; PHYS 502 or equivalent recommended.

Hours of Lecture or Seminar per week
3
PHYS 614 - Thermodynamics and Kinetics of Materials

Credits: 3
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.

Prerequisites
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
Cross-Listed with CSI 685

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.

Prerequisites
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
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.

Prerequisites
PHYS 510 and 303 or permission of instructor.
PHYS 630 - Introduction to Biophysics

Credits: 3
Cross-Listed with BINF 740

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.

Prerequisites
Undergraduate degree in physics or permission of instructor.

PHYS 660 - Space Weather

Credits: 3
Cross-Listed with ASTR 660

Overview of space weather including sun, heliosphere, magnetosphere, and ionosphere.

Prerequisites
Graduate standing, or permission of instructor.

PHYS 676 - Atmospheric Physics

Credits: 3
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.

Prerequisites
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**

Credits: 3
Fundamental concepts, including one-dimensional solutions of Schrodinger's equations, operators in Hilbert space, observables, propagators, and harmonic oscillators.

**Prerequisites**
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
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.

**Prerequisites**
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
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.

**Prerequisites**
Undergraduate degree in physics or permission of instructor.

**Hours of Lecture or Seminar per week**
3
PHYS 703 - Seminar in Physics

Credits: 1
A general seminar course that combines invited seminars from faculty (both internal and external) with graduate student seminars.

Prerequisites
Permission of instructor.

Hours of Lecture or Seminar per week
1
Hours of Lab or Studio per week
0

PHYS 705 - Classical Mechanics

Credits: 3
Study of classical mechanics; topics include variational principles, constrained motion, Lagrangian and Hamiltonian mechanics, canonical transformations, and applications (central forces, rigid-body motion, oscillations).

Prerequisites
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
Cross-Listed with CHEM 730/CSI 782

Topics include thermodynamics, kinetic theory, ensemble theory, quantum statistics, and applications.

Prerequisites
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 760 - Space Plasma Physics

Credits: 3
Cross-Listed with ASTR 760

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.

Prerequisites
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
Cross-Listed with CSI 789

Selected topics in physics not covered in fixed-content physics courses.

Prerequisites
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
Advanced topics in quantum mechanics. Covers rotations, angular momentum, 3D solutions to Schrodinger's equations, symmetries, conservation laws, approximate methods, and spin mechanics.

Prerequisites
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
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.

**Prerequisites**
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
Reading and research on a specific topic in physics or related field under the direction of a faculty member.

**Prerequisites**
Admission to master's program, and permission of instructor.

**Notes**
May be repeated as needed.

**Hours of Lecture or Seminar per week**
0

**Hours of Lab or Studio per week**
0

**PHYS 798 - Research Project**

Credits: 3
Project chosen and completed under the guidance of a graduate faculty member, which results in an acceptable technical report.

**Prerequisites**
9 graduate credits, and permission of instructor.

**Hours of Lecture or Seminar per week**
0

**Hours of Lab or Studio per week**
0

**Grading**
S/NC
PHYS 799 - Master's Thesis

Credits: 1-6
Project chosen and completed under the guidance of a graduate faculty member, which results in an acceptable technical report and oral defense.

Prerequisites
9 graduate credits, and permission of instructor.

Hours of Lecture or Seminar per week
0

Hours of Lab or Studio per week
0

Grading
S/NC

PHYS 998 - Doctoral Dissertation Proposal

Credits: 1-12
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.

Prerequisites
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
S/IP

PHYS 999 - Doctoral Dissertation

Credits: 1-12
Doctoral research performed under direction of dissertation director.

Prerequisites
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

PRLS 110 - Exploring Outdoor Adventure

Credits: 2
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
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
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
This course is for individuals who have never done any formal rock climbing. The course will involve activities to teach students basic climbing terms, techniques, equipment, and safety practices for top rope belay climbing and rappelling. We will build on 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
This intermediate course is for individuals who have some prior skills in rock climbing looking to further increase their skill level. The course will involve 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.

Prerequisites
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
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
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
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.

Prerequisites
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
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 Rock Climbing**

Credits: 1
This course 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.
Prerequisites
PRLS 116 or permission of instructor

Hours of Lecture or Seminar per week
1

Hours of Lab or Studio per week
0

PRLS 170 - Introduction to White-water Kayaking

Credits: 1
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
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
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.
Prerequisites
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
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
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.

Prerequisites
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
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.

Prerequisites
PRLS 180 or permission of instructor
PRLS 190 - Downhill and Cross-Country Skiing

Credits: 1
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.

Hours of Lecture or Seminar per week
1
Hours of Lab or Studio per week
0

PRLS 191 - Snowboarding

Credits: 1
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.

Hours of Lecture or Seminar per week
1
Hours of Lab or Studio per week
0

PRLS 195 - Introduction to Hot Air Ballooning

Credits: 2
The course will include 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.

Hours of Lecture or Seminar per week
2
Hours of Lab or Studio per week
0

PRLS 210 - Introduction to Recreation and Leisure
Credits: 3
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.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

PRLS 214 - Field Study in Natural History

Credits: 3
This course provides an introduction to natural history and its application in natural area interpretation through field study investigation of the environment. Fundamentals of bird, plant, animal, and rock identification, as well as sky and landscape interpretation, will be covered.

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
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 Facilitator Field Work

Credits: 2
Fundamental principles and techniques of challenge course facilitation. Consolidate classroom learning in an experiential setting through leading youth groups in the field. Introduction to specific safety, skills, and facilitation techniques for the Hemlock Overlook challenge course, including all low elements, mechanics of operating the zip wire complex, and belay and safety for the Total Team Challenge™.

Prerequisites
PRLS 220; CPR and first aid certifications
PRLS 241 - Practicum

Credits: 3
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.

Prerequisites
PRLS 210 and 310 for majors; PRLS 210, 310, 316, 327

Corequisite
PRLS 410 for minors

Notes
Open to majors and minors only.

PRLS 250 - Wilderness Travel and Sustainability

Credits: 2
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.

Prerequisites
PRLS 120
PRLS 253 - Florida Everglades Canoe Expedition

Credits: 3
This course 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

PRLS 300 - People with Nature

Credits: 3
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.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

PRLS 302 - Park Management and Operations

Credits: 3
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.

Prerequisites
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  
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.

Prerequisites  
PHED 200, PRLS 210, SPMT 201, or TOUR 200

Hours of Lecture or Seminar per week  
3

Hours of Lab or Studio per week  
0

PRLS 316 - Outdoor Education and Leadership

Credits: 3  
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  
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.

Hours of Lecture or Seminar per week  
3

Hours of Lab or Studio per week  
0

PRLS 327 - Foundations of Therapeutic Recreation

Credits: 3  
Covers nature and perceptions of disability and their consequences; problems of stigma, stereotype, and labeling; and principles of normalization and inclusion. Introduces therapeutic recreation model and activity assessment.

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
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 402 - Human Behavior in Natural Environments

Credits: 3
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.

**Prerequisites**
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

PRLS 405 - Planning, Design, and Maintenance of Leisure Facilities

Credits: 3
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.

**Prerequisites**
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

PRLS 410 - Administration of RHT Organizations I

Credits: 3
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.

**Prerequisites**
60 credits

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**PRLS 411 - Administration of RHT Organizations II**

Credits: 3
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.

**Prerequisites**
PRLS 310 and 410, and 60 credits

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**PRLS 416 - Issues and Trends in Therapeutic Recreation**

Credits: 3
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.

**Prerequisites**
PRLS 327

**Notes**
Field experience required.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**PRLS 418 - Assessment in Therapeutic Recreation**

Credits: 3
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.

**Prerequisites**
PRLS 327 and 416

**Notes**
Field experience required.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

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**PRLS 450 - Research Methods**

Credits: 3
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.

**Prerequisites**
HEAL 323 and STAT 250, and 60 credits

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

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**PRLS 460 - Sport and Recreation Law**

Credits: 3
Emphasizes safety, liability, and risk. Covers current law and liability issues for administrators of RHT facilities and programs.

**Prerequisites**
60 credits

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

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**PRLS 480 - Special Topics in Parks, Recreation, and Leisure Studies**

Credits: 3
Selected topics reflecting interest in specialized areas of parks and outdoor recreation or therapeutic recreation.

**Prerequisites**
60 credits
PRLS 490 - Internship

Credits: 12
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.

Prerequisites
90 credits; HEAL 205 and 323; PHED 200; and PRLS 210, 310, 316, and 410

PRLS 499 - Independent Study

Credits: 1-3
Individual study of topic area in leisure research, theory, or practice under direction of faculty.

Prerequisites
90 credits

PRLS 501 - Introduction to Natural Resources Law

Credits: 3
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.

Prerequisites
PRLS 460 and 90 credits, graduate status, or permission of instructor
PRLS 503 - Disability Rights Law in Therapeutic Recreation

Credits: 3
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.

Prerequisites
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

PRLS 526 - Environmental Education and Resource Interpretation

Credits: 3
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.

Prerequisites
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

PRLS 531 - Natural Resources Recreation Planning

Credits: 3
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.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0
PRLS 533 - Visitor Services

Credits: 3
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
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 560 - Liability and Risk Management

Credits: 3
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

Credits: 1-6
Projects related to parks, recreation, and leisure studies.

Prerequisites
90 credits

Notes
May be repeated for a total of 6 credits.
PRLS 599 - Independent Study

Credits: 1-3
Study of a problem area in parks, recreation, and leisure studies research; theory or practice under the direction of faculty member.

Prerequisites
90 credits

Notes
May be repeated. No more than 3 credits may be earned.

PSCI 701 - Frontiers of Physical Sciences

Credits: 3
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.

Prerequisites
Admission to physical sciences doctoral program.

PSCI 702 - Research Methods

Credits: 3
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.

Prerequisites
Admission to physical sciences doctoral program.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**PSCI 703 - Frontiers of Physical Sciences**

Credits: 1
This course 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.

**Prerequisites**
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

**PSCI 998 - Dissertation Proposal**

Credits: 1-12
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.

**Prerequisites**
Permission of advisor.

**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

**Hours of Lab or Studio per week**
0

**Grading**
S/IP

**PSCI 999 - Doctoral Dissertation**
Credits: 1-12
Doctoral research performed under direction of dissertation director.

Prerequisites
Admission to candidacy in physical sciences doctoral program.

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.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
0
Grading
S/IP

PSYC 100 - Basic Concepts in Psychology

Credits: 3
Introduces psychology as scientific discipline. Examines concepts and methods in learning, motivation, development, personality, and measurement.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

PSYC 110 - Seminar in General Psychology

Credits: 1
Explores applications, implications, methods, and findings of psychology.

Corequisite
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
Review of major developmental theories including perspectives of childhood, adolescence, adulthood, and old age.

Prerequisites
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
Study of human behavior development in a social matrix, including such topics as socialization, cultural behavior, group norms, and attitude formation.

Prerequisites
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
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.

Prerequisites
6 credits of psychology or permission of instructor and department.

Notes
Course culminates in a paper describing techniques learned. No more than six credits in PSYC 260, 350, and 460 can be used toward a psychology major.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
0

PSYC 300 - Statistics in Psychology
Credits: 4
Descriptive and inferential statistics in design, analysis, and interpretation of psychological research with practical application using computers in laboratory.

Prerequisites
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
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.

Prerequisites
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
Principles of animal learning, including such topics as classical and operant conditioning, discrimination learning, and animal cognition.

Prerequisites
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
Principles of perception, including topics such as psychophysics, perceptual organization, perceptual learning, and perceptual constancies.

Prerequisites
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
Study of human psychological development from conception to adolescence including such topics as genetic factors, emotional and intellectual growth, and environmental influences.

Prerequisites
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

Credits: 3
Study of the biological and cultural changes accompanying adolescence, including the effect of these changes on emotional, intellectual, and social development.

Prerequisites
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
An in-depth overview of important topics in cognitive psychology, including memory, attention, pattern recognition, problem solving, reasoning, and psycholinguistics.

Prerequisites
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
Examination and application of principles underlying the theory, interpretation, and administration of psychological tests, including a study of tests of intelligence, achievement, and ability.

Prerequisites
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
Review of the theories and methods in psychological counseling.

Prerequisites
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

Credits: 3
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.
Prerequisites
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
Review and application of research techniques including interviewing, survey analysis, and process analysis. PSYC 323 is a writing-intensive course.

Prerequisites
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
Introduction to classical and contemporary theories of personality, and comparative evaluation of major theories in terms of relevant studies.

Prerequisites
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
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.

Prerequisites
PSYC 100, and one of PSYC 211, 231, or 324; or permission of instructor.

Hours of Lecture or Seminar per week
PSYC 326 - Therapeutic Communication Skills

Credits: 3
Introduction to understanding and use of basic therapeutic communication skills used in clinical and counseling psychology.

Prerequisites
PSYC 325 or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

PSYC 327 - Psychology in the Community

Credits: 3
Individual placements in applied psychology settings.

Prerequisites
Psychology major with minimum 6 psychology credits, and permission of associate chair for undergraduate studies.

Notes
Maximum 6 credits of PSYC 327, 328, 421, 422, 548, and 549 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
Course comprises one-hour service learning component linked to selected psychology courses.

Prerequisites
Psychology major with minimum 6 psychology credits and permission of course instructor and associate chair for undergraduate studies.

Corequisite
Enrollment in psychology course for which this is service learning component.

Notes
Maximum 6 credits of PSYC 327, 328, 421, 422, 548, and 549 can be applied to the psychology major.
PSYC 330 - Psychology of Adjustment

Credits: 3
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.

Prerequisites
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
Examination of application of psychological principles and methods to problems commonly encountered in business and industry.

Prerequisites
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 350 - Directed Reading and Research in Psychology

Credits: 1-3
Library research in psychology, culminating in a substantial formal paper; individualized sections by arrangement with faculty.

Prerequisites
PSYC 100 and 300, and permission of instructor and department.
Notes
No more than six credits in PSYC 260, 350, and 460 can be used toward psychology major.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
0

PSYC 362 - Psychology of Women

Credits: 3
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.

Prerequisites
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
Survey of neuroscience, including basic neuroanatomy, neural and synaptic transmission, neural mechanisms underlying normal and abnormal behavior, and biological mechanisms of drug action.

Prerequisites
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
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.

Prerequisites/Corequisites
PSYC 372 or 375 or permission of instructor.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
2

**PSYC 375 - Brain and Behavior I**

Credits: 3
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.

**Prerequisites**
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 376 - Brain and Behavior II**

Credits: 3
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.

**Prerequisites**
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
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.

**Prerequisites**
PSYC 100, or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

**PSYC 414 - Behavior Disorders of Childhood**

Credits: 3
Review of the theories, methods, and research dealing with emotional and behavioral disorders of children.

**Prerequisites**
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
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.

**Prerequisites**
PSYC 100 or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

**PSYC 418 - Death, Dying, and Grieving**

Credits: 3
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.

**Prerequisites**
PSYC 100 or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0
PSYC 421 - Undergraduate Practicum in Psychology

Credits: 3
Supervised experience in application of psychological principles requiring work in a nonclassroom situation.

Prerequisites
PSYC 325 and 326, and permission of Clinical Review Committee.

Notes
No more than 6 credits in PSYC 327, 328, 421, 422, 548, and 549 can be used toward psychology major.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

PSYC 422 - Undergraduate Practicum in Psychology

Credits: 3
Supervised experience in application of psychological principles requiring work in a nonclassroom situation.

Prerequisites
PSYC 325 and 326, and permission of Clinical Review Committee.

Notes
No more than 6 credits in PSYC 327, 328, 421, 422, 548, and 549 can be used toward psychology major.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

PSYC 423 - Group Psychotherapy Techniques

Credits: 3
Review of theory and methods of group therapy with emphasis on humanistic and interpersonal approaches, including applications to family therapy, alcoholism, and drug abuse.

Prerequisites
PSYC 324 or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0
**PSYC 435 - Personnel Training and Development: A Psychological Perspective**

Credits: 3
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.

**Prerequisites**
PSYC 230

**Prerequisites/Corequisites**
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: 1-3
Advanced research methods in psychology in context of individual student projects or assisting with research on faculty projects; individual sections by arrangement with faculty.

**Prerequisites**
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**
0

**Hours of Lab or Studio per week**
0

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**PSYC 461 - Special Topics**

Credits: 3
Selected topics reflecting interest in specialized areas.

**Prerequisites**
See course description in Schedule of Classes.

**Notes**
Announced in advance.

**Hours of Lecture or Seminar per week**
3
PSYC 465 - History and Systems in Psychology

Credits: 3
Historical background and major theoretical systems in modern psychology. Approaches include behaviorism, cognitive/information processing approaches, and psychodynamic theories.

Prerequisites
18 credits in psychology including PSYC 317, or permission of instructor

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

PSYC 466 - Psychology of Intimate Relationships

Credits: 3
Advanced survey of theories and research related to intimate relationships, including romantic relationships and those among family members and friends.

Prerequisites
PSYC 100 and 231; PSYC 324 recommended; or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

PSYC 467 - The Psychology of Working in Groups and Teams

Credits: 3
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.

Prerequisites
60 credits including PSYC 100, or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0
PSYC 472 - Advanced Physiological Psychology

Credits: 3
Rotating topics. Physiological mechanisms underlying behavior. Selected topics include neuronal bases of learning and memory, and biological bases of reinforcement and addiction.

Prerequisites
PSYC 372 or 375 and 376; or permission of instructor.

Notes
May be repeated once with approval of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

PSYC 490 - Psychology Honors I

Credits: 3
Review of topics and issues in psychology, including historical overview, theory and supporting data, and influences on behavior.

Prerequisites
Admission to Psychology Department honors program.

Notes
Topics vary. May not be repeated.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

PSYC 491 - Psychology Honors II

Credits: 3
Introduces advanced statistics, research methodologies, statistics packages, computing and information technology, and library technology appropriate for psychological research and pedagogy.

Prerequisites
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
**PSYC 492 - Psychology Honors III**

Credits: 3
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.

**Prerequisites**
PSYC 491, and approval of proposal for final honors project or thesis.

**Notes**
May not be repeated.

**PSYC 499 - Senior Thesis**

Credits: 3
Directed research on topic agreed on by student and advisor.

**Prerequisites**
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
Comparative review of prevalent theories of personality with special emphasis on fundamental models, and similarities and differences.

**Prerequisites**
PSYC 518 - Death, Dying, and Grieving

Credits: 3
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.

Prerequisites
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
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.

Prerequisites
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

PSYC 530 - Cognitive Engineering: Cognitive Science Applied to Human Factors

Credits: 3
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.

Prerequisites
Experimental lab course, or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

**PSYC 531 - Mammalian Neurobiology**

Credits: 3
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.

**Prerequisites**
PSYC 527.

**Hours of Lecture or Seminar per week**
2

**Hours of Lab or Studio per week**
3

**PSYC 532 - The Social Psychology of Industry**

Credits: 3

**Prerequisites**
PSYC 333.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**PSYC 541 - Survey Research**

Credits: 3
Introduces theory, method, and practice of survey research; students complete survey research project.

**Prerequisites**
PSYC 300 or SOCI 221, or permission of instructor.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**PSYC 548 - Practicum in Gerontology**
Credits: 3
Practical experience in gerontological setting under supervision of qualified professional for 150 contact hours per 3 credits.

Prerequisites
Completion of three of the required courses in gerontology certificate program, or permission of instructor.

Notes
No more than 6 credits in PSYC 327, 328, 421, 422, 548, and 549 can be used toward psychology major.

Hours of Lecture or Seminar per week
0

Hours of Lab or Studio per week
0

PSYC 549 - Practicum in Gerontology

Credits: 3
Practical experience in gerontological setting under supervision of qualified professional for 150 contact hours per 3 credits.

Prerequisites
Completion of three of the required courses in gerontology certificate program, or permission of instructor.

Notes
No more than 6 credits in PSYC 327, 328, 421, 422, 548, and 549 can be used toward psychology major.

Hours of Lecture or Seminar per week
0

Hours of Lab or Studio per week
0

PSYC 552 - Histology/Histochemistry of the Brain

Credits: 5
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.

Prerequisites
PSYC 372 or equivalent.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
2

PSYC 556 - Chemistry and the Brain
Credits: 3
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.

Prerequisites
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
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.

Prerequisites
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
Examines neuronal mechanisms involved in learning and memory, in animals ranging from invertebrates to humans.

Prerequisites
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
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.
Prerequisites
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
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.

Prerequisites
PSYC 231, or permission of instructor.

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
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.

Prerequisites
PSYC 372 or equivalent.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

PSYC 591 - Professional Seminar

Credits: 1-3
See area coordinator for requirements for section in each track.

Prerequisites
MA students in psychology.

Notes
Each section limited to students in one concentration of MA program. May be repeated for total 3 credits only.
PSYC 592 - Special Topics

Credits: 3
Special topics reflecting interests in specialized areas.

Notes
Topic announced in advance.

PSYC 597 - Directed Reading and Research

Credits: 1-3
Independent reading or research on topic agreed on by student and faculty member.

Prerequisites
Permission of instructor

Notes
Directed reading or research for MA students in psychology. May be repeated for maximum 6 credits. Maximum 9 credits of 597, 792, 798, and 799 may be applied to master's degree.

PSYC 611 - Advanced Statistics

Credits: 4
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.

Prerequisites
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

PSYC 612 - Advanced Statistics

Credits: 4
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.

Prerequisites
Grade of A or B in PSYC 611.

Notes
Students must enroll in 611 and 612 in sequential semesters.

PSYC 614 - The Psychology of Aging

Credits: 3
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.

Prerequisites
PSYC 100, and undergraduate or graduate course in aging.

PSYC 615 - Language Development

Credits: 3
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.
Prerequisites
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
Intensive survey of major types of psychopathological disturbances of infancy and childhood.

Prerequisites
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
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
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
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.

Prerequisites
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
Expands capability to deal with more complex behavioral situations, enabling ability to relate to more sophisticated professional issues and environments.

Prerequisites
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
Further expands capability to deal with more complex behavioral situations, enabling ability to relate to more sophisticated professional issues and environments.

Prerequisites
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
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.

**Prerequisites**
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
Study of administration, scoring, and interpretation of standard tests used by industry for selection and assessment of personnel.

**Prerequisites**
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
Examines research techniques specifically designed to evaluate human effectiveness of organizations and mental health programs.

**Prerequisites**
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
Intensive survey of historical and current issues in major areas of applied (nonclinical) psychology.
Prerequisites
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
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.

Prerequisites
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
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.

Prerequisites
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
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.

Prerequisites
PSYC 300, or permission of instructor.

Hours of Lecture or Seminar per week
PSYC 645 - Research Methods in Human Factors and Applied Cognition

Credits: 3
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.

Prerequisites
PSYC 530 and 611.

Notes
May be repeated for credit.

PSYC 646 - Issues and Methods in Longitudinal Developmental Research

Credits: 3
Examines techniques for measuring developmental change across lifespan.

Prerequisites
PSYC 611 and 612, and 6 credits of graduate developmental psychology.

PSYC 648 - Developmental Psychopathology

Credits: 3
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.

Prerequisites
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
Basic concepts in experimental design, fundamental assumptions in analysis of variance, and analysis of variance and covariance designs. Reviews multiple comparison tests.

Prerequisites
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
Theory and techniques involved in studying people in their natural environment. Primary emphasis on quasiexperimental designs and methods of systematic observation.

Prerequisites
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 666 - Cognitive and Perceptual Development

Credits: 3
Survey of theory and research on development of perception, memory, concepts, problem solving, intelligence, and academic skills in children.

Prerequisites
6 credits of child psychology, and course in experimental psychology; or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0
PSYC 667 - Behavior in Small Groups and Teams

Credits: 3
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.

Prerequisites
PSYC 231.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

PSYC 668 - Personality: Theoretical and Empirical Approaches

Credits: 3
Presents comprehensive overview of current theoretical and empirical approaches to personality. Emphasizes areas of special relevance to clinical, developmental, and industrial/organizational psychology.

Prerequisites
PSYC 324, or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

PSYC 669 - Social and Emotional Development

Credits: 3
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.

Prerequisites
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
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
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
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 total 9 credits.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
0

**PSYC 684 - Psychological Counseling Techniques**

Credits: 3
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
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
Surveys concepts in learning, cognitive, and affective processes, including theories and supporting data and their influences on behavior.

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
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
Surveys social influences on behavior, including group processes, person perception, and attitude formation.

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
Surveys theories and research regarding lifespan development and personality formation.

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
Important historical and systematic approaches to psychology and their relationship to the philosophy of science, structure of theory, and philosophical issues 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
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.
Prerequisites
Department permission; and PSYC 617 or 822 and PSYC 320 or equivalent.

Corequisite
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
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.

Prerequisites
Satisfactory completion as certified by the School Psychology Committee; PSYC 617, 709, 822, or 810; and permission of department.

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 712 - Child Neuropsychological Assessments

Credits: 3
Survey of basic theoretical and applied knowledge of conceptualization and assessment procedures of brain-behavior relationship in school-age child and adolescent.

Notes
Open to practicing school psychologists, school psychology graduate students, PhD developmental students, or by permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0
PSYC 722 - Advanced Child Assessment

Credits: 4
Problems involved in diagnostic assessment of children with various handicapping conditions such as learning disabilities, retardation, and emotional disturbances.

Prerequisites
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
Practical experience in organizational setting as assigned.

Prerequisites
Permission of department. Apply in writing to area coordinator 60 days prior to beginning of semester.

Notes
Open only to degree students in psychology. PhD students may repeat course for maximum 15 credits; MA students for maximum 6 credits.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
0
Grading
S/NC

PSYC 732 - Attention and Performance

Credits: 3
Human factors seminar focusing on theories, concepts, issues, methods, techniques, and research in the area of attention and performance.

Prerequisites
PSYC 530, graduate experimental course in psychology, or PSYC 701.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0
PSYC 733 - Issues in Personnel Psychology

Credits: 3
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.

Prerequisites
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
Emphasizes current research and application of human factors, ergonomics, applied cognition, and applied perception.

Prerequisites
6 graduate credits in human factors and applied cognition, or 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

PSYC 735 - Psychological Perspectives on Organizational Development

Credits: 3
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.

Prerequisites
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

Prerequisites
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

Credits: 3
Emphasizes current research and development in human-computer interaction, cognitive systems engineering, cognitive ergonomics, and cognitive engineering.

Prerequisites
6 graduate credits in human factors and applied cognition, or 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

PSYC 739 - Seminar in Industrial/Organizational Psychology

Credits: 3
Rotating topics such as leadership theories and management development, and performance appraisal.

Prerequisites
PSYC 333 and 636, or permission of instructor.

Notes
Topics announced in advance. May be repeated for credit.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0
PSYC 741 - Psychology of Work Motivation

Credits: 3
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.

Prerequisites
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
Practical experience in school psychology.

Prerequisites
PSYC 709

Notes
Open only to school psychology MA students.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
0

PSYC 751 - School Psychology Assessment Practicum II

Credits: 2
Practical experience in school psychology.

Prerequisites
PSYC 750.

Notes
Open only to School Psychology MA students. Apply in writing for permission of department 60 days prior to beginning of semester.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
0
PSYC 754 - Quantitative Methods III: Psychological Applications of Regression Techniques

Credits: 3
Reviews psychological applications of regression techniques in variety of contexts including experimental, field, and survey settings.

Prerequisites
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
Surveys multivariate statistical techniques as applied to psychological research. Emphasizes analysis of complex designs and interpretation of multivariate data analyses resulting from computer processing.

Prerequisites
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
Focuses on noncognitive individual differences that predict performance. Published work discussed in seminar format with emphasis on conceptual development, methodological adequacy, and new directions.

Prerequisites
PSYC 754.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

PSYC 758 - Dispositional Predictors of Performance
Credits: 3
Focuses on individual differences other than cognitive ability that predict performance. Papers discussed in seminar format with eye toward conceptual development and empirical review.

Prerequisites
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
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.

Prerequisites
PSYC 611/612

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

PSYC 766 - Advanced Topics in Sensation and Perception

Credits: 3
Emphasizes current research in sensation and perception.

Prerequisites
PSYC 530 or 701.

Notes
May be repeated for credit.

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
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.

**Prerequisites**
PSYC 530 or 701

**Notes**
May be repeated for credit.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**PSYC 780 - Applied Developmental Psychology**

Credits: 3
Examines how developmental theory, knowledge base, and methodology can be used to promote health and welfare of individuals across lifespan. Topics include contemporary social issues and child development, research in applied settings, developmental assessment and intervention, and program evaluation.

**Prerequisites**
PSYC 704, or 3 credits of other graduate developmental psychology courses, and permission of instructor.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**PSYC 786 - Assessment and Treatment in Gerontology**

Credits: 3
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.

**Prerequisites**
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**
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.

**Prerequisites**
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**
0

**Hours of Lab or Studio per week**
0

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**PSYC 792 - Practicum in Developmental Psychology, Biopsychology, and School Psychology**

Credits: 1-6
Supervised experience in developmental psychology, biopsychology, or school psychology.

**Prerequisites**
3 credits of graduate developmental psychology or biopsychology or advanced standing in school psychology.

**Notes**
Open to degree students in developmental psychology, biopsychology, or school psychology MA or PhD programs. Interested students must apply to area coordinator 60 days before registration.

**Hours of Lecture or Seminar per week**
1

**Hours of Lab or Studio per week**
0

**Grading**
S/NC

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**PSYC 798 - Thesis Proposal**

Credits: 1-6
Work on a proposal for master's thesis.

**Prerequisites**
Permission of instructor

**Notes**
May not be repeated for credit.

**Hours of Lecture or Seminar per week**

PSYC 799 - Master’s Thesis

Credits: 1-6
Research on approved master's thesis topic under direction of thesis committee with approval of chair.

PSYC 810 - Psychological Assessment I

Credits: 4
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.

PSYC 811 - Psychological Assessment II

Credits: 4
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.
PSYC 816 - Neuropsychological Assessment

Credits: 3
Nature of brain behavior relationships in adults and children. Concentrates on major assessment techniques including Luria Nebraska, Halstead-Reitan, and Michigan Neuropsychological batteries.

Prerequisites
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
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

Credits: 3
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
Review of history, systems, and theories of clinical psychology emphasizing traditional theories of personality and
Psychotherapy.

**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  
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  
Introduces major models of group, marital, and family functioning as well as current approaches to group, marital, and family psychotherapy.

**Prerequisites**
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  
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
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

PSYC 841 - Community Psychology II

Credits: 3
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
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.

Hours of Lecture or Seminar per week
1
Hours of Lab or Studio per week
0

PSYC 880 - Clinical Foundations
Credits: 3
Focus on basic clinical and interactional skills, including basic therapy skills, psychodiagnostic interviewing, mental status exam, and interview management skills.

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 881 - Practicum in Clinical Psychology

Credits: 3
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.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
0

PSYC 885 - Clinical Externship

Credits: 0
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
0
Hours of Lab or Studio per week
0

PSYC 888 - Clinical Supervision: Theory, Research, and Practice

Credits: 3
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.

Prerequisites
6 credits of PSYC 881.

Hours of Lecture or Seminar per week
PSYC 890 - Seminar in Professional Psychology

Credits: 1-3
Each section limited to students in one concentration of PhD program. See area coordinator for requirements for section in each track.

Notes
Open only to degree students. May be repeated for credit.

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: 3
Selected topics reflecting specialized areas in psychology.

Notes
Open only to PhD students. Content varies. May be repeated.

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
Independent reading on topic agreed on by student and faculty member.

Notes
Clinical psychology PhD students may not take this course for elective credit. May be repeated. May not be repeated for degree credit by students who also register for PSYC 799.

Hours of Lecture or Seminar per week
0

Hours of Lab or Studio per week
0
PSYC 998 - Doctoral Dissertation Proposal

Credits: variable
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.

Grading
S/NC

PSYC 999 - Doctoral Dissertation

Credits: variable
Research on approved dissertation topic under direction of dissertation committee.

Notes
May be repeated. No more than 24 credits of PSYC 998 and 999 may be applied to doctoral degree requirements.

Grading
S/NC

PUAD 502 - Administration in Public and Nonprofit Organizations

Credits: 3
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
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: 1-3
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
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 510 - Policing in a Democratic Society

Credits: 3
Topics include police mission; impact of police subculture; defining, recognizing, and measuring good police work; moral hazards of policing such as corruption, brutality, and deception; promotion of integrity, discretion, and control; impact of police practices on crime and disorder; securing public support; and legitimacy of police, community policing, and other reforms.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

PUAD 611 - Problem Solving and Data Analysis I

Credits: 3
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.
Prerequisites
Passing grade on screening exam.

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
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.

Prerequisites
PUAD 611

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
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.

Prerequisites
PUAD 611.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

PUAD 615 - Administrative Law

Credits: 3
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 620 - Organization Theory and Management Behavior

Credits: 3
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.

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
Major management theories applicable to American federal system. Emphasizes organization, structure, and operations. Explores relationship of theories to management practices in contemporary American administration.

Prerequisites
PUAD 620.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

PUAD 622 - Program Planning and Implementation

Credits: 3
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.

Prerequisites
PUAD 620.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

PUAD 623 - Managing Government Contracting
Credits: 3
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
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
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 629 - Special Topics in Public Management**

**PUAD 630 - Emergency Planning and Preparedness**

Credits: 3
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.
PUAD 631 - Disaster Response Operations and Recovery

Credits: 3
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
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
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
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
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: 1-3
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 640 - Public Policy Process

Credits: 3
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.

Prerequisites
PUAD 502.

Hours of Lecture or Seminar per week
3
PUAD 642 - Environmental Policy

Credits: 3
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.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

PUAD 643 - Public Policy Research

Credits: 3
Examines major concepts, designs, and methods used in applied policy research. Explores underlying logic of policy inquiry, and use of quantitative and qualitative techniques. Includes case applications of major styles of inquiry; and steps in planning, administering, and reporting policy research.

Prerequisites
PUAD 640.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

PUAD 644 - Public Policy Models

Credits: 3
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.

Prerequisites
PUAD 640.

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
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.

Prerequisites
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
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

Credits: 3
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.

Prerequisites
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
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.
**Puad 502 or 505**

**Prerequisites**

**Hours of Lecture or Seminar per week**

3

**Hours of Lab or Studio per week**

0

**Puad 657 - Association Management**

Credits: 3

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.

**Prerequisites**

**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

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**

Credits: 3

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.

**Prerequisites**

Graduate standing.

**Hours of Lecture or Seminar per week**

3
PUAD 660 - Public and Nonprofit Accounting and Finance

Credits: 3
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.

Prerequisites
Course open only to admitted MPA or association/nonprofit management certificate students

PUAD 661 - Public Budgeting Systems

Credits: 3
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.

PUAD 662 - National Budgeting

Credits: 3
Examines formulation of overall national fiscal policy and budgetary priorities through presidential and congressional budget processes, including decisions over spending and revenues.

PUAD 663 - State and Local Budgeting
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
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.

**Prerequisites**
course open only to admitted MPA or association/nonprofit management certificate students.

**PUAD 670 - Human Resources Management in the Public Sector**

Credits: 3
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.

**Prerequisites**
PUAD 502.

**PUAD 671 - Public Employee Labor Relations**

Credits: 3
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.
PUAD 672 - Human Resources Reforms for Public Administration

Credits: 3
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.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

PUAD 680 - Managing Information Resources

Credits: 3
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.

Prerequisites
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
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.

Prerequisites
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
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.

Prerequisites
Admission to MPA program, and 18 credits.

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
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
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.

Prerequisites
PUAD 502, 620, and 9 graduate credits.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

PUAD 720 - Performance Measurement

Credits: 3
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
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.

**Prerequisites**
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: 1-3
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.

**Prerequisites**
PUAD 502, and 9 graduate credits.

**Notes**
May be repeated with different topic.

**Hours of Lecture or Seminar per week**
1-3

**Hours of Lab or Studio per week**
0

**PUAD 730 - Professional Development Workshop**

Credits: 1-3
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
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: 1-3
Examines issues of topical interest in general area of international security. Possible topics include nuclear strategy, disarmament, American defense policy, and international terrorism.

**Prerequisites**
PUAD 504, 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 739 - Issues in International Management**

Credits: 1-3
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.

**Prerequisites**
PUAD 502, and 9 graduate credits.
PUAD 741 - Policy Analysis

Credits: 3
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.

Prerequisites
PUAD 502, 611, and 640.

PUAD 742 - Program Evaluation

Credits: 3
Practical exploration of assessment techniques used in studying results of public programs and policies, including evaluation of implementation strategies and impacts. Draws on multiple approaches such as cost analysis, field research, experiments, productivity analysis, surveys and questionnaires, and qualitative studies.

Prerequisites
PUAD 502 and 611.

PUAD 749 - Issues in Public Policy

Credits: 1-3
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.

Prerequisites
PUAD 502, and 9 graduate credits.
PUAD 750 - Federalism and Intergovernmental Relations

Credits: 3
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.

Prerequisites
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
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: 1-3
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.

Prerequisites
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: 1-3
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.

Prerequisites
PUAD 502, and 9 graduate credits.

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
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.

Prerequisites
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
Examines organization and administration of justice and security organizations. Covers organization theory and behavior as applied to justice and security organizations.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

PUAD 791 - Justice Program Evaluation

Credits: 3
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.

**Prerequisites**
PUAD 611 and 612.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**PUAD 793 - Conduct of Justice Organizations at the Street Level**

Credits: 3
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.

**Prerequisites**
JLCP 740/GOVT 790, or permission of instructor.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**PUAD 794 - Internship**

Credits: 1-6
Open only to MPA students. Contact internship coordinator one semester before enrollment. Credit determined by the department.

**Prerequisites**
12 PUAD credits or permission of instructor.

**Hours of Lecture or Seminar per week**
0

**Hours of Lab or Studio per week**
0

**PUAD 795 - Leadership in Justice and Security Organizations**

Credits: 3
Examines leadership theories, and explores fundamental questions about leadership in justice and security organizations today.

**Prerequisites**
JLCP 740/PUAD 790, or permission of instructor.
PUAD 796 - Directed Readings and Research

Credits: 1-3
Reading and research on specific topic under direction of faculty member. Written report is required; oral exam covering research and report may be required.

Prerequisites
18 PUAD credits and permission of instructor.

Notes
May be repeated once.

PUAD 797 - Changing Justice and Security Organizations

Credits: 3
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.

Prerequisites
JLCP 740/PUAD 790 or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

PUAD 798 - Colloquium in Public Administration

Credits: 0
Colloquium series required of all graduate students in public administration. Features a variety of speakers from academia, governments, think tanks, and the nonprofit sector. Topics include recent developments in public administration theory and research, public and nonprofit sector behavior, public policy.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
0
Grading
Graded S/NC

PUAD 799 - Issues in Justice Administration

Credits: 1-3
Explores current issues in justice administration. Considers diverse perspectives on current and emerging issues concerning administration of justice. Emphasizes using theory and evidence to evaluate different viewpoints on issues. Course topics vary, typically focusing on law enforcement, corrections, legal issues and public law, crime control, conflict resolution, victimization experience, technological innovation, public participation in justice process, or cross-national comparison of justice systems.

Prerequisites
PUAD 502 and 9 graduate credits.

Hours of Lecture or Seminar per week
1-3

Hours of Lab or Studio per week
0

PUAD 821 - Doctoral Seminar in Theories of Organization and Bureaucracy

Credits: 3
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.

Prerequisites
PUAD 620 or equivalent, or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

PUAD 840 - Research Seminar in Policy Governance I

Credits: 2-4
Cross-Listed with PUBP 840

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.

Prerequisites
Admission to doctoral program or permission of instructor.

Hours of Lecture or Seminar per week
PUAD 841 - Research Seminar in Policy Governance II

Credits: 2-4
Cross-Listed with PUBP 841

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.

Prerequisites
Admission to doctoral program.

PUAD 998 - Doctoral Proposal Research

Credits: 1-6
Work on a research proposal that forms basis for doctoral dissertation.

Prerequisites
Permission of advisor.

PUAD 999 - Doctoral Dissertation

Credits: 1-24
Registration for total credits may be spread over a multisemester contiguous period. PhD candidates must register for at least 3 credits each semester until dissertation completed.

Prerequisites
Permission of participant's dissertation committee.
PUBP 501 - Policy and Organizational Analysis

Credits: 4
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
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
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
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
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
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**

Short course covering math and calculus skills required for master's level managerial economics course PUBP720.

**PUBP 556 - Writing Workshop**

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.

**PUBP 601 - Theory and Practice of Regional Economic Development**
Credits: 3
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

Credits: 3
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

PUBP 605 - State and Local Government Policy and Economic Development

Credits: 3
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

PUBP 650 - Peace Operations I

Credits: 3
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
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.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

PUBP 700 - Theory and Practice in Public Policy

Credits: 3
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
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 703 - Organizational Informatics in Public Policy

Credits: 3
Helps policy professionals develop proficiency in technological skills necessary for effective practice by teaching latest developments in organizational informatics and web-based student-teacher interaction. Uses information technology to understand real-world policy problems.
PUBP 704 - Statistical Methods in Policy Analysis

Credits: 3
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.

PUBP 705 - Advanced Statistical Methods in Policy Analysis

Credits: 3
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.

Prerequisites
PUBP 704 or equivalent.

PUBP 706 - Environmental Decisions: Modeling Rational Judgment

Credits: 3
Discusses decision aids for environmental or other policy makers to make and defend decisions soundly and economically. Integrates public policy and environmental science with decision analysis; for example, prescriptive models that quantify knowledge and values person or institution brings to bear on a decision. Applies simple aids, based on decision theory, to real consulting cases.

Prerequisites
PUBP 705.

Credits: 3
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
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
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
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
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
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.

**Prerequisites**
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
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
PUBP 715 - Introduction to Transportation Systems

Credits: 3
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
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: 3
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
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
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
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
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
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
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.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

PUBP 724 - Intelligent Transportation Systems and Technology

Credits: 3
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
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
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
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
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
PUBP 729 - Transportation Asset Management

Credits: 3
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 - National Policy Systems and Theory

Credits: 3
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
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 732 - Transport and the Environment
Credits: 3
Multidisciplinary course examines implications of transportation and how public policy has attempted to handle them, and how policy may move in future. Looks at all modes of transportation and at most environmental ramifications. In addition to two faculty members, several guest speakers provide wider perspectives on particular issues.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**PUBP 733 - Urban Politics and Policy**

Credits: 3
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
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
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 - The Global Information Economy and the Digital Divide

Credits: 3
Discusses institutional, social, and policy issues involved in development of global information economy and society. Economic development needs, public institutional capacity, nongovernmental networks examined critically; course deals with implications of universal access to Internet and equality of use in areas such as online delivery of government services, privacy, online voting, and e-government. Focuses on efforts to ameliorate digital divide sponsored by major multilateral agencies. Emphasizes development of public policies for democratic governance in a complex networked world.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

PUBP 737 - Cases and Concepts in E-Government

Credits: 3
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

PUBP 738 - Information, Technology, and Institutional Change

Credits: 3
Examines role and character of information in institutions as foundation to understanding role of IT in economy, society and politics. Considers theories of and practice of information in institutions, organizations and markets, and assesses effects of information technology changes on key economic, social and political institutions such as firms, markets, communities, nonprofit organizations, and government.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

PUBP 739 - Media and Public Policy

Credits: 3
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 741 - U.S. Financial Policy Processes and Procedures**

Credits: 3
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.

**Hours of Lecture or Seminar per week**
3
**Hours of Lab or Studio per week**
0

**PUBP 742 - Transportation Safety and Security**

Credits: 3
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
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
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
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
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
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.
PUBP 748 - Public Transportation Policy, Operations and Logistics

Credits: 3
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.

PUBP 749 - Highway Transportation Policy, Operations and Logistics

Credits: 3
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.

PUBP 750 - History of Military Operations Other than War

Credits: 3
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.

PUBP 751 - International Police Operations
Credits: 3
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
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
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
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**
PUBP 755 - National Security Decision-Making Policy

Credits: 3
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 - Geostrategic Assessment Policy

Credits: 3
Geopolitical assessment of global threats to international order and security. First half of course focuses on geopolitical theories; elements of military power; and global social, demographic and political trends. Second half analyzes regional, political, military, economic, and social trends.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

PUBP 757 - Public Policy in Global Health and Medical Practice

Credits: 3
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.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

PUBP 758 - Global Threats and Medical Policies

Credits: 3
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
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
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
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 towing the objective of crafting a practical plan for the launch of a novel and needed social venture.

**Hours of Lecture or Seminar per week**
Hours of Lab or Studio per week
0

PUBP 762 - Social Institutions and Public Policy

Credits: 3
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.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

PUBP 768 - Education and Public Policy

Credits: 3
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 770 - Topics in Regional and Urban Development Policy

Credits: 3
Explores leadership and institutional development in regional economic development. First part involves presentations by faculty members on conceptual, theoretical, and methodological traditions regarding leadership and institutional development. Second part focuses on issue of leadership in context of regional economic development.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0
PUBP 771 - Introduction to Enterprise Engineering and Policy

Credits: 3  
**Cross-Listed with** SYST 691/EEP 601

Provides overview of extended enterprise integration. Lectures focus on SAP architecture and R/3 standard software solution. Laboratory requires students to complete end-to-end implementation project with Great Plains Software midrange ERP solution, Dynamics C/S+. For modeling, students must demonstrate complete proficiency in Architecture of Information Systems (ARIS) methodology and supporting ARIS Toolset.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

PUBP 772 - Decision Support for Enterprise Integration

Credits: 3  
**Cross-Listed with** SYST 692/EEP 602

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 provided in ERP systems.

**Prerequisites**
SYST 542 and 691 or equivalent.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

PUBP 773 - Supply Chain Integration and Management

Credits: 3  
**Cross-Listed with** SYST 693/EEP 603

Lectures focus 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 ERP/Web integration, advanced planning, and customer relationship management.

**Prerequisites**
SYST 691 or equivalent.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0
PUBP 774 - E-Commerce Architectures

Credits: 3
Cross-Listed with SYST 694/EEP 604

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 (SANs), server clustering, load balancing techniques at server and network level, fault tolerance, and recovery of database and application servers.

Prerequisites
SYST 691 or equivalent.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

PUBP 775 - Economics of Electronic Commerce

Credits: 3
Cross-Listed with SYST 695/EEP 605

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.

Prerequisites
SYST 691 or equivalent.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

PUBP 776 - Customer Relationship Management

Credits: 3
Cross-Listed with SYST 696/EEP 606

Focuses on front office integration with back office, and value creation process that results. Modern world of e-commerce extends intraenterprise integration as implemented in Enterprise Resource Planning (ERP) systems to include external constituents such as customers, partners, and suppliers. Course focuses on modern system support for demand chain.

Prerequisites
SYST 691 or equivalent.
PUBP 777 - Critical Information Technology Infrastructures

Credits: 3
Cross-Listed with SYST 697/EEP 607

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.

Prerequisites
SYST 694 or equivalent.

PUBP 780 - Evolution of the Washington Metropolitan Economy

Credits: 3
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.

PUBP 781 - Entrepreneurship and Economic Development

Credits: 3
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.
PUBP 782 - International Financial Policy

Credits: 3
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
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
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 785 - Urban Development Economics
Credits: 3  
Examines changing structure and functions of urban economy, and develops skills and knowledge for evaluating and remedying conditions inhibiting local economic development. Includes case studies of redevelopment strategies, programs, and outcomes for inner-city neighborhoods, central and suburban business districts, waterfronts, and surplus military bases.

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  
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  
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.

**Prerequisites**  
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**

Credits: 4  
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
**PUBP 794 - Internship**

Credits: 1-6
Open only to students in SPP degree program requiring internship. Contact appropriate program director one semester before enrollment. Work-study programs with specific employers.

**Prerequisites**
12 PUBP credits, or permission of instructor.

**Notes**
Credit determined by appropriate degree program.

**Hours of Lecture or Seminar per week**
0

**Hours of Lab or Studio per week**
0

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**PUBP 795 - Final Project**

Credits: 1-3
Writing of capstone paper related to student's program concentration, under guidance of three-person committee.

**Hours of Lecture or Seminar per week**
0

**Hours of Lab or Studio per week**
0

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**PUBP 796 - Directed Readings and Research**

Credits: 1-3
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

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**PUBP 799 - Master's Thesis**
Credits: 1-6
Individualized section form required. Original research endeavor related to student's program concentration. Research must result in document meeting public policy and university standards.

Prerequisites
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
0
Hours of Lab or Studio per week
0
Grading
S/NC

PUBP 800 - Culture and Policy

Credits: 2-4
Comparative overview of institutions and culture, focusing on ways United States is exceptional when compared with other mature industrial societies. Presents culture and social structure as explanatory variables in accounting for these differences. Provides overview of analytical methods used in comparative public policy research, and background on political environment in which international trade and investment decisions are made.

Hours of Lecture or Seminar per week
2-3
Hours of Lab or Studio per week
0-1

PUBP 801 - Macro Policy

Credits: 2-4
Demonstrates how macroeconomic, technological, demographic, and social forces affect supply and demand for governmental services. Counterpart analysis of the impact of shifts in patterns of international trade, demographic composition of population, and trends in social structure. Builds awareness of need to factor alternative assumptions about macro environment into policy planning; shows how macro events can affect social welfare and policy performance indicators; and suggests how national income accounting analysis and simple macroeconomic models can help pinpoint impending trouble spots for public policy.

Prerequisites
PUPB 720 and PUBP 730, or their equivalents.

Hours of Lecture or Seminar per week
2-3
Hours of Lab or Studio per week
0-1

PUBP 802 - The Logic of Policy Inquiry
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.

**Prerequisites**
Enrollment in doctoral program in public policy.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

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**PUBP 804 - Multivariate Statistical Analysis in Public Policy**

Credits: 4  
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.

**Prerequisites**
PUBP 704 or equivalent.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

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**PUBP 805 - Public Policy Systems and Theory**

Credits: 4  
Theories of public policy making, emphasizing discipline's historical, intellectual, and international development. Focuses on policy systems' political and social dimensions, including agenda-setting, policy design, rationality, incrementalism, systems theory, scientific methods, and public choice theory. Applies theories to comparative systems of governance.

**Prerequisites**
PUBP 730 or equivalent.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

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**PUBP 806 - Advanced Management Science for Public Organizations**

Credits: 4  
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.

Prerequisites
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: 2-5
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.

Hours of Lecture or Seminar per week
2-3

Hours of Lab or Studio per week
0-1

PUBP 811 - Applied Methods in Regional Development and Transportation Policy

Credits: 2-4
Students develop research papers that investigate aspect of regional and transportation policy, with goal of producing publishable papers. Students develop focus of paper based on work done in first semester, and are expected to prepare two-page proposal followed by detailed proposal and finally, completed paper. Each is critiqued in the seminar, which is organized to conform to process of review and critique. Instructor works with students individually as well as in seminar sessions.

Prerequisites
PUBP 810.

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: 2-4
Research workshop examining development of policy research and relevant methodologies linked directly to faculty and student interests. Students identify cutting-edge policy concerns and execute research program. The 4-credit version of course requires
discussion section and research laboratory.

**PUBP 820 - Technology, Science, and Innovation: Institutions and Governance**

Credits: 2-4  
First of two-semester core seminar sequence required for public policy PhD students in 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 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: 2-4  
Second of two-semester core seminar sequence required for public policy PhD students in science and technology policy concentration. Covers major methodological approaches to 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.

**Hours of Lecture or Seminar per week**  
2-3  
**Hours of Lab or Studio per week**  
0-1

**PUBP 830 - Comparative Socioeconomic Policy**

Credits: 2-4  
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
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
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
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: 2-4
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
PUBP 841 - U.S. Policy-Making Processes

Credits: 2-4
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.

PUBP 850 - Seminar in Public Policy

Credits: 1
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.

PUBP 860 - Social Theory, Culture, and Public Policy

Credits: 2-4
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.

PUBP 861 - Culture and Social Policy Analysis

Credits: 2-4
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  
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  
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: 1-4  
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.

Prerequisites  
PUBP 870.

Hours of Lecture or Seminar per week  
3
PUBP 872 - Managing Knowledge-Based, Information-Intensive Organizations

Credits: 4
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
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
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
Requires work on field statement in preparation for field exam.

Notes
Must register in semester during which field exam will be taken. Requires permission of field committee chair. 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

PUBP 998 - Research/Proposal for Dissertation

Credits: 1-9
Requires work on research proposal that forms basis for doctoral dissertation.

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

PUBP 999 - Dissertation

Credits: 1-9
Requires research on approved dissertation topic under director on dissertation committee.

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

REAL 500 - Real Estate Development Fundamentals

Credits: 3
A comprehensive study of the main elements of the real estate development process. The course will examine 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 be examined. One of the main learning vehicles will be the case study, whereby student groups will take a property and track the real estate development life cycle, from inception through construction and management.
REAL 502 - Real Estate Client Leadership and Project Management

Credits: 3

A study of the challenges faced by developers, both in terms of client (owner) challenges as well as project challenges. In the first half of the course, the class will examine 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. In the second half of the course, the class will examine specific project challenges—project assessment frameworks, and improvement approaches. A key part of this course will be the two case studies, whereby each student group will identify a client challenges, and then a project challenge, and dissect them. At the conclusion of the each part, each group will present its case.

Prerequisites
Graduate standing, REAL 500 (or CEIE 580) or permission of instructor

REAL 630 - Innovative Land Use, Approvals and Real Estate Development

Credits: 3

This course will examine the challenges in designing innovative uses for land and balancing those prospective uses with local urban policies and the land development/zoning process. The course begins with an introduction to the entitlements process, as well as the legal considerations of planning and zoning in America. The course will then introduce the language of zoning and explore the impacts of the different forms of government on the entitlement process. In addition, the class will participate in a case study, beginning with the evaluation of a plot of land, developing suggested uses, assembling a project application submission, and ultimately seeking a building permit.

Prerequisites
REAL 500, or permission of instructor

REAL 690 - Topics in Real Estate Development

Credits: 1-6

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.

Prerequisites
Admission to the MSRED Program, and completion of core requirements

REAL 750 - MSRED Capstone
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.

**Prerequisites**
Admission to the MSRED Program, and completion of all other course work

**REAL 796 - Directed Reading**

Credits: 1-6
Reading on a specific topic under the direction of a faculty member. May be repeated with a change in topic.

**Prerequisites**
Admission to the MSRED Program, and completion of core requirements

**RELI 100 - The Human Religious Experience**

Credits: 3
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.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**RELI 211 - Religions of the Near (Middle) East**

Credits: 3
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 Bahá’ísm, as well as Zoroastrianism and religions of ancient Near Eastern cultures.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0
RELI 212 - Religions of the Orient

Credits: 3
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.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

RELI 231 - Religion in America

Credits: 3
Religious heritage in American culture, growth of denominations and sects, and interrelationship of religion and sociopolitical life.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

RELI 235 - Religion and Literature

Credits: 3
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.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

RELI 272 - Islamic Religious Life

Credits: 3
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.

Hours of Lecture or Seminar per week
3
REL 313 - Hindu Religion and Philosophy

Credits: 3
Hindu religious and philosophical developments from origins through formative periods.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

REL 314 - Chinese Philosophies and Religious Traditions

Credits: 3
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.

Prerequisites
REL 212, or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

REL 315 - The Buddhist Tradition

Credits: 3
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.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

REL 316 - The Christian Traditions

Credits: 3
Surveys origins and development of Christian traditions to present. Emphasizes diversity of forms of Christianity in different
time periods, societies and cultures.

**RELI 317 - The Daoist Tradition**

Credits: 3
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.

**RELI 337 - Mysticism: East and West**

Credits: 3
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.

**RELI 341 - Global Perspectives on Spirituality and Healing**

Credits: 3
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.

**Prerequisites**
30 credits, or permission of instructor.
**RELI 350 - Religion and History of Ancient Israel**

Credits: 3  
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.

**Prerequisites**  
RELI 211, or permission of instructor

**Hours of Lecture or Seminar per week**  
3  
**Hours of Lab or Studio per week**  
0

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**RELI 351 - Religions of the Ancient Near East**

Credits: 3  
Examines religions of ancient Near East, ancient Egypt, Mesopotamia, Levant (Syria-Palestine), or Asia Minor. Selection of religion depends on instructor.

**Hours of Lecture or Seminar per week**  
3  
**Hours of Lab or Studio per week**  
0

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**RELI 352 - Judaism from Exile to Talmud**

Credits: 3  
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.

**Prerequisites**  
RELI 211, or permission of instructor.

**Hours of Lecture or Seminar per week**  
3  
**Hours of Lab or Studio per week**  
0

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**RELI 356 - Jesus and the Gospels**

Credits: 3  
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.
Prerequisites
RELI 211, or permission of instructor

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

RELI 370 - Judaism: Life and Thought

Credits: 3
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.

Prerequisites
RELI 211, 3 credits in religious studies, or permission of instructor

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

RELI 371 - Classic Jewish Texts

Credits: 3
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
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 373 - Varieties Of Jewish Expression

Credits: 3
Investigates different ways Jews have addressed religious, historical, and existential situations, with special reference to literature, philosophy, historical and polemical writing. Also includes visual arts and new media. Course may cover one theme or problem in several different periods, or concentrate on one geographical/linguistic area or historical period. Topics may include Holocaust, Jews in Muslim Spain, Post-War American Judaism. May be taken more than once with permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

RELI 374 - Islamic Thought

Credits: 3
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.

Prerequisites
RELI 211, 3 credits in religious studies, or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

RELI 375 - Qur'an and Hadith

Credits: 3
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.

Prerequisites
3 credits in philosophy and religious studies, or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

RELI 376 - Special Topics in Religious Thought
RELI 377 - Special Topics in Religious Thought
Credits: 3
Selected topics from a philosophical perspective.
Prerequisites
3 credits in philosophy or religious studies, or permission of instructor.
Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

RELI 381 - Beginnings of Christianity
Credits: 3
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.
Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

RELI 401 - Death and the Afterlife in World Religions
Credits: 3
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.
Prerequisites
60 credits including 6 credits in religious studies or permission of instructor
Hours of Lecture or Seminar per week
3
REL 402 - Religious Fundamentalism and Violence

Credits: 3
Studies origins and development of fundamentalism and violence in global religions, with special emphasis on contemporary manifestations and potential for resolution.

Prerequisites
60 credits including 6 credits in religious studies, or permission of instructor.

REL 403 - Scripture and Authority in World Religions

Credits: 3
Examines origins, development, and role of Scripture (religious texts) in world religions, concentrating on issues of divine inspiration, authority, authenticity, and canon.

Prerequisites
60 credits including 6 credits in religious studies, or permission of instructor.

REL 405 - Religion, Values, and Globalization

Credits: 3
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.

Prerequisites
60 credits including 6 credits of religious studies, or permission of instructor.
RELI 407 - Women in the World's Religions

Credits: 3
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.

Prerequisites
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 408 - Ritual and Drama in Global Religions

Credits: 3
Explores religious rituals and drama in selected world religions. Emphasizes ritual and drama spanning divine and human realms, actualizing myth, presenting beliefs, and shaping lives of believers. May consider religious themes in modern drama.

Prerequisites
60 credits including 6 credits in religious studies, or permission of instructor

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

RELI 420 - Seminar

Credits: 3
Limited to students in the religious studies track of philosophy major, but others may be admitted if topic is sufficiently close to field of study.

Notes
Topics vary.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

RELI 421 - Seminar

Credits: 3
Limited to students in the religious studies track of philosophy major, but others may be admitted if topic is sufficiently close to
field of study.

Notes
Topics vary.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

RELI 422 - Seminar

Credits: 3
Limited to students in the religious studies track of philosophy major, but others may be admitted if topic is sufficiently close to field of study.

Notes
Topics vary.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

RELI 423 - Seminar

Credits: 3
Limited to students in the religious studies track of philosophy major, but others may be admitted if topic is sufficiently close to field of study.

Notes
Topics vary.

Hours of Lecture or Seminar per week
3

RELI 425 - Directed Readings in Religious Studies

Credits: 1-3
Individual readings and research in religious studies on a topic selected in consultation with instructor.

Prerequisites
Religious studies majors with 60 credits including 6 in religious studies.

Hours of Lecture or Seminar per week
3
RELI 490 - Comparative Study of Religions

Credits: 3
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.

Prerequisites
9 credits in religious studies including RELI 211 and 212, or permission of instructor.

Notes
Can be repeated for credit when specific topics are different.

RELI 591 - Special Topics in Religious Studies

Credits: 3
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.

RELI 630 - Approaches to the Study of Religion

Credits: 3
Examines study of religion as academic discipline. Evaluates various intellectual approaches and methods used in study of religious phenomena.

Prerequisites
Graduate standing, or permission of instructor.

Hours of Lecture or Seminar per week
3
RELI 631 - Sacred as Secular in Modern Spirituality

Credits: 3
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.

Prerequisites
Graduate standing, or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

RELI 632 - World Religions in Conflict and Dialogue

Credits: 3
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.

Prerequisites
Graduate standing, or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

RELI 633 - Ethical Perspectives of World Religions

Credits: 3
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.

Prerequisites
Graduate standing, or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0
RELI 635 - World Religions in Transition and Transformation

Credits: 3
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.

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

RELI 636 - Religion and the Natural Environment

Credits: 3
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
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 641 - Drama in the World's Religions

Credits: 3
Examines how drama is used in religions of world, past and present, to enact myths, convey concepts, and involve worshippers. Studies ritual dramas, mystery, morality, passion plays, plays that explore profoundly religious themes.

Prerequisites
Graduate standing, or permission of instructor.

**REL 642 - Sacred Language, Scripture, and Culture**

Credits: 3
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.

**Prerequisites**
Graduate standing, or permission of instructor.

**Notes**
May be repeated once when languages are different.

**RUSS 101 - Elementary Russian I**

Credits: 3
For students with no knowledge of Russian. Introduces elements of grammar, vocabulary, oral skills, listening comprehension, and reading.

**Notes**
Lab work required. Students may not receive credit for RUSS 101 and RUSS 109 or 110.

**RUSS 102 - Elementary Russian II**

Credits: 3
Continuation of RUSS 101.

**Prerequisites**
RUSS 101 or permission of department.
Notes
Lab work required. 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
1

RUSS 109 - Intensive Elementary Russian

Credits: 6
Equivalent to RUSS 101 and 102 taught in single semester.

Notes
Recommended for students who desire intensive introduction. Lab work required. 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
Introduces elements of grammar, vocabulary, oral skills, listening comprehension, and reading.

Notes
Lab work required. 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
1

RUSS 199 - Russian Language and Culture for Students and Professionals

Credits: 3
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
0
RUSS 201 - Intermediate Russian I

Credits: 3
Further development of skills in listening, speaking, reading, and writing.

Prerequisites
RUSS 102, 109, appropriate placement score, or permission of department.

Notes
RUSS 201 and 202 must be taken in sequence. Lab work required. Students may not receive credit for RUSS 201 and RUSS 209 or 210.

RUSS 202 - Intermediate Russian II

Credits: 3
Application of language skills to reading, composition, and discussion.

Prerequisites
RUSS 201, appropriate placement score, or permission of department.

Notes
Lab work required. Students may not receive credit for RUSS 202 and RUSS 209 or 210.

RUSS 209 - Intensive Intermediate Russian

Credits: 6
Equivalent to RUSS 201 and 202 taught in a single semester.

Prerequisites
RUSS 102, 109, appropriate placement score, or permission of department.

Notes
Lab work required. Students may not receive credit for RUSS 209 and RUSS 201, 202, or 210.
RUSS 210 - Intermediate Russian

Credits: 3
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.

Prerequisites
RUSS 110 or appropriate placement score.

Notes
Students may not receive credit for RUSS 210 and RUSS 201, 202, or 209.

RUSS 250 - Gateway to Advanced Russian

Credits: 3
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.

Prerequisites
RUSS 210, appropriate placement score, or permission of department.

Notes
Taught in Russian.

RUSS 302 - Russian Conversation and Composition

Credits: 3
Development of students' ability to express themselves orally on topics of current interest and everyday situations; composition provides practice in more difficult forms of expression.

Prerequisites
RUSS 250, appropriate placement score or permission of instructor.
RUSS 303 - Russian Advanced Conversation

Credits: 3
Development of oral proficiency, including current colloquial expressions.

Prerequisites
RUSS 250, appropriate placement score or permission of instructor.

RUSS 310 - Readings in Russian Literature

Credits: 3
Readings of Russian literary works in original language with lectures, discussions, and exam in Russian.

Prerequisites
RUSS 250, appropriate placement score or permission of instructor.

RUSS 311 - Contemporary Russian Short Fiction

Credits: 3
Reading and discussion of recent short stories by best-known Russian writers of today.

Prerequisites
RUSS 250, appropriate placement score or permission of instructor.

Notes
Readings in original language, with lectures and discussion in Russian.
RUSS 325 - Major Russian Writers

Credits: 3
Study of works of major Russian writers in translation.

Prerequisites
ENGL 101 or equivalent, or permission of instructor.

Notes
Course work in English. Writers to be studied vary. May be taken toward fulfilling general requirement in literature for baccalaureate degrees. May be repeated once for credit when course content is different.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

RUSS 326 - A Survey of Russian Literature

Credits: 3
Surveys Russian literature from its beginning to 1880.

Prerequisites
60 credits, or permission of instructor.

Notes
Course work in English. May be taken toward fulfilling general requirement in literature for baccalaureate degrees.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

RUSS 327 - A Survey of Russian Literature

Credits: 3
Surveys Russian literature of late 19th and 20th centuries.

Prerequisites
60 credits, or permission of instructor.

Notes
Course work in English. May be taken toward fulfilling general requirement in literature for baccalaureate degrees.

Hours of Lecture or Seminar per week
3
RUSS 353 - Russian Civilization

Credits: 3
Civilization and culture of Russia and former Soviet Union. Includes films, slides, and music in addition to readings and lectures.

Prerequisites
60 credits, and completion or concurrent enrollment in all other required general education courses

Notes
Course work in English.

RUSS 354 - Contemporary Post-Soviet Life

Credits: 3
Social life, art, economics, education, view of life, and personal aspirations of Russian citizen today.

Prerequisites
60 credits, or permission of instructor.

Notes
For non-Western credit. Course work in English.

RUSS 380 - Advanced Russian I

Credits: 3
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.

Prerequisites
RUSS 202, 209, or equivalent.

Hours of Lecture or Seminar per week
3
RUSS 381 - Advanced Russian II

Credits: 3
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.

Prerequisites
RUSS 202, 250, or equivalent; appropriate placement score; or permission of instructor.

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
Reading, translation, and discussion of Russian materials in fields of history, politics, geography, and sociology.

Prerequisites
15 credits of Russian or equivalent.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

RUSS 407 - Russian Drama and Theater

Credits: 3
Development of Russian theater including directing techniques in Moscow Art Theater. Reading and discussion of major Russian plays of 19th and 20th centuries.

Prerequisites
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
Historical development of Russian poetry and representative works of major poets.

Prerequisites
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
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.

Prerequisites
60 credits, 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

RUSS 480 - Fourth-Year Russian

Credits: 3
Advanced work in major grammatical and lexical topics of Russian. Application of theoretical principles in guided written and oral exercises.

Prerequisites
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
Advanced work in major grammatical and lexical topics of Russian. Application of theoretical principles in guided written and oral exercises.

Prerequisites
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
Research and analysis of selected problem in language, literature, or culture in consultation with member of Russian studies faculty.

Prerequisites
Russian studies major with 90 credits and permission of instructor.

Hours of Lecture or Seminar per week
0

Hours of Lab or Studio per week
0

RUSS 491 - Independent Study

Credits: 1-3
Research and analysis of selected problem in language, literature, or culture in consultation with member of Russian studies faculty.

Prerequisites
Russian studies major with 90 credits and permission of instructor.

Hours of Lecture or Seminar per week
0

Hours of Lab or Studio per week
0

RUSS 499 - Seminar on Russian Literary and Critical Bibliography
Credits: 3
Comprehensive bibliographic survey of major primary and secondary works of Russian literature and criticism.

Prerequisites
Russian studies major with 90 credits and permission of instructor.

Hours of Lecture or Seminar per week
3

SEOR 998 - Doctoral Dissertation Proposal

Credits: 1-12
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

SEOR 999 - Doctoral Dissertation

Credits: 1-12
Formal record of commitment to doctoral dissertation research under direction of faculty member approved by SEOR Department.

Prerequisites
Admission to doctoral candidacy.

Notes
May be repeated as needed.

SOAN 500 - Communicating across the Disciplines

Credits: 3
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.

Prerequisites
Admission to MAIS concentration in global interaction.
SOAN 510 - Culture and Globalization

Credits: 3
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.

Prerequisites
SOAN 500

SOAN 670 - Special Topics in Sociology and Anthropology

Credits: 4-8
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.

Prerequisites
Graduate standing, or permission of instructor.

SOCI 101 - Introductory Sociology

Credits: 3
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.
**SOCI 102 - Introduction to Sociological Inquiry**

Credits: 3
Offers introduction to sociology through conduct of original student research, informed by small group and classroom discussion of sociological ideas and methods exemplified by seminal texts. Especially recommended for students considering majoring in sociology, as well as students interested in studying sociology as a liberal art.

Notes
Students may not receive credit for both SOCI 101 and 102.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**SOCI 120 - Globalization and Society**

Credits: 3
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.

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 Human Freedom**

Credits: 3
Examines how various social institutions function to organize and regulate society. Topics include family, education, ideology, law, media, work, governmental planning, and stratification. Serves as a foundation of many specialized courses offered by department, especially those that focus on control of crime and delinquency.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**SOCI 301 - Criminology**
Credits: 3
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
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
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.

Prerequisites
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 - Sociology of Work and Occupations

Credits: 3
Analysis of how societies structure work and allocate economic functions among different groups and classes. Topics include historical and cross-cultural variations in work, human consequences of industrialization, and impact of transition to post-industrial society. Special emphasis on changing position of professional employees and social factors that affect distribution of opportunity among various groups, and growing significance of technology for the nature of work.

Hours of Lecture or Seminar per week
3
SOCI 305 - Sociology of Small Groups

Credits: 3
Characteristics, structure, and processes of small group dynamics; theories and models of group analysis, techniques of observation and research in small groups; research theory and application of small group knowledge to such natural groups as mutual aid self-help groups, families, juvenile delinquent gangs, and task groups in work sites.

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
Explores process by which people organize to resist current social arrangements and create alternative institutions, policies, or leadership. Historical and contemporary case studies of domestic and global change used to explore how, why, and to what effect various groups have organized to reject status quo and create social change.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

SOCI 308 - Racial and Ethnic Relations

Credits: 3
How race and ethnicity have been shaped by the policies and practices in Western and non-Western societies. Background given on evolution of racial and ethnic sentiments from Western colonial period in African, Asian, Middle Eastern, and Latin American countries as well as contemporary U.S. racial and ethnic relations. Explores how changing demographic racial patterns may affect future definitions of race and ethnicity.

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
Focuses on family in history and family forms in contemporary societies. Looks at interaction within families and relationship
between society and families.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**SOCI 310 - Sociology of Deviance**

Credits: 3
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
Explores sociological tradition through readings and discussions of ideas drawn from writings of selected sociological thinkers such as Comte, Marx, Weber, Durkheim, and others.

**Prerequisites**
9 credits of sociology including SOCI 101, 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
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.

**Prerequisites**
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
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.

Prerequisites
SOCI 101, or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
2

SOCI 314 - Sociology of Culture

Credits: 3
Contemporary examination of culture as aspect of symbolic order, social institutions, and everyday practices of social life. Introduces range of different approaches to sociological study of culture with emphasis on problems of cultural difference and narrative aspects of culture in institutions of democratic society.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

SOCI 315 - Sex and Gender in Contemporary Society

Credits: 3
Changing conceptions of sex roles, both female and male, in contemporary society. Using historical and comparative data, considers differential socialization of males and females in relation to changing social structure in which it takes place.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

SOCI 320 - Social Structure and Globalization

Credits: 3
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.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**SOCI 326 - Armed Conflict and Conflict Resolution**

Credits: 3
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

**SOCI 332 - Sociology of Urban Communities**

Credits: 3
Urban community, including historical development, demography, and ecology of metropolitan areas; urbanism as a way of life; emergence of suburbia; and future of cities.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**SOCI 340 - Power, Politics, and Society**

Credits: 3
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 350 - Community, Diversity, and Democracy: A Practicum**
Develops practical skills for reducing prejudice and building community within diverse workplaces, educational and civic organizations and local neighborhoods. Specific skills taught empower individuals to be effective communicators across differences, work with controversial issues and build multicultural coalitions.

**SOCI 352 - Social Problems**

Credits: 3  
Sociological analysis of the problems of modern society, including those related to stratification, urbanism, family and kinship, cultural change, and deviant behavior.

**SOCI 355 - Social Inequalities**

Credits: 3  
Studies class structures and implications for individuals and groups in U.S. society. Explores issues of race and ethnicity, language and immigration status, sex and gender, social class, age, and sexual orientation. Students critically examine theory and research that explores construction, experience, and meaning of such differences.

**SOCI 360 - Youth Culture and Society**

Credits: 3  
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.
SOCI 373 - The Community

Credits: 3
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
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.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

SOCI 382 - Education in Contemporary Society

Credits: 3
Studies education as social institution and its function as socialization agency for social stability and social change. Emphasizes influences of social class elements on educational process and 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 383 - Human Services in Society

Credits: 3
Analyzes human services emphasizing government-sponsored, nonprofit organizations and informal voluntary services, and their interrelationships with health care and welfare systems. Comparative analysis of services in other societies. Observation in service agencies.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0
**SOCI 385 - Sociology of Religion**

Credits: 3  
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  
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.

*Hours of Lecture or Seminar per week*
3  
*Hours of Lab or Studio per week*
0

**SOCI 395 - Issues in Sociology**

Credits: 3  
Opportunity to apply to contemporary relevant issues the theoretical perspectives and methodological skills previously learned.

**Prerequisites**
90 credits, and 12 credits of sociology.

*Hours of Lecture or Seminar per week*
3  
*Hours of Lab or Studio per week*
0

**SOCI 399 - Independent Study**

Credits: 1-3  
Open to sociology majors only. Prerequisites: 6 credits of sociology including SOCI 101, and approval of written proposal. Individual study of sociological topic of interest to student.

*Hours of Lecture or Seminar per week*
SOCI 402 - Sociology of Punishment and Corrections

Credits: 3
Theories explaining forms of punishment systems; punishment and corrections as products 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.

Prerequisites
6 credits of sociology including SOCI 101, or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

SOCI 405 - Analysis of Social Data

Credits: 4
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.

Prerequisites
60 credits, SOCI 313 or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
3

SOCI 410 - Social Surveys and Attitude and Opinion Measurements

Credits: 3
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.

Prerequisites
SOCI 303 and 313 or equivalents, or permission of instructor.

Hours of Lecture or Seminar per week
3
**SOCI 412 - Contemporary Sociological Theory**

Credits: 3  
Analyzes contemporary sociological theorists such as Parsons, Merton, Mills, Berger, and Gouldner in terms of their relationship to major schools of contemporary sociological theory.

**Prerequisites**  
12 credits of sociology including SOCI 101 and 311, or permission of instructor.

**Hours of Lecture or Seminar per week**  
3  
**Hours of Lab or Studio per week**  
0

**SOCI 414 - Sociology of Language**

Credits: 3  
Interaction of language and social structure. Focuses on language as revealing culturally specific rules of interpretation; sex, class, race, and setting of specific uniformities in producing talk; and language as it constrains individuals.

**Prerequisites**  
60 credits and 3 credits of sociology, 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  
Intended to promote learning in application of sociological knowledge, and build skills in different work settings. Students work in approved setting as applied sociologists.

**Prerequisites**  
21 credits of sociology, including Research Methods, or permission of instructor.

**Notes**  
Required: minimum 40 hours of work for each credit.

**Hours of Lecture or Seminar per week**  
1-6  
**Hours of Lab or Studio per week**  
0
SO CI 421 - Field Work in Social Change

Credits: 3
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.

Prerequisites
6 credits of sociology or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

SO CI 441 - The Sociology of Aging

Credits: 3
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.

Prerequisites
6 credits of sociology, or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

SO CI 450 - The Holocaust: The Construction of Social History through Survivor Testimonies

Credits: 3
Examines Holocaust, destruction of European Jewry, through testimonies of survivors and narratives of historians. Topics include historical and cultural circumstances that encouraged German anti-Semitism, rise of Nazism, ghettoization of Jews in Poland, Jewish life in ghettos, European Jews under Nazi occupation, Jewish resistance, Christian rescuers, invasion of Russia and mobile killing units, life in hiding and passing, forced labor camps and concentration camps, responses of United States and world, and reflections on Holocaust today. Also considers eyewitness testimony, memory, narrative, and literature.

Prerequisites
60 credits, or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0
**SO CI 471 - Prevention and Deterrence of Crime**

Credits: 3  

**Prerequisites**  
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

**SO CI 475 - Women and the Law**

Credits: 3  
Prerequisite for 575: undergraduate senior status in sociology or graduate standing. Analyzes changing position of women in law from legal and sociological perspectives. Focuses on how law defines and regulates women's rights in variety of areas such as employment, marriage and divorce, reproduction and control of one's body, and violence against women. Explores social and economic consequences of various legal doctrines, and compares laws and policies in United States with those in other countries.

**Prerequisites**  
60 credits, or permission of instructor.

**Hours of Lecture or Seminar per week**  
3

**Hours of Lab or Studio per week**  
0

**SO CI 480 - Honors Seminar in Sociology I**

Credits: 3  
Linked, sequential courses normally given by the same instructor. Involves application of theoretical and methodological knowledge to analysis of social issue that serves as course's central theme.

**Prerequisites**  
Admission to sociology honors program, and permission of instructor.

**Hours of Lecture or Seminar per week**  
0

**Hours of Lab or Studio per week**  
0
SOCI 481 - Honors Seminar in Sociology II

Credits: 3
Linked, sequential courses normally given by the same instructor. Culminates in preparation and presentation of substantive research paper.

Prerequisites
Admission to sociology honors program, and permission of instructor.

Hours of Lecture or Seminar per week
0

Hours of Lab or Studio per week
0

SOCI 482 - Honors Internship in Sociology

Credits: 3
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.

Prerequisites
Admission to Sociology Honors Program and permission of instructor.

Hours of Lecture or Seminar per week
0

Hours of Lab or Studio per week
0

SOCI 483 - The Sociology of Higher Education

Credits: 3
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.

Prerequisites
60 credits.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

SOCI 492 - Sociology of Organizations
Credits: 3
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.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

**SOCI 499 - Independent Research in Sociology**

Credits: 1-4
Investigation of sociological problem according to individual interest, with emphasis on research.

**Prerequisites**
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
0
Hours of Lab or Studio per week
0

**SOCI 503 - Sociology of Law**

Credits: 3
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.

**Prerequisites**
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 505 - Sociology of Sex and Gender**

Credits: 3
Advanced study of sex roles in contemporary society. Using historical and comparative data, examines perceived, prescribed, and actual sex differentiation in social, political, and economic roles.

**Prerequisites**
Undergraduate senior status in sociology, graduate standing, or permission of instructor.
SOCI 515 - Applying Sociology

Credits: 3
Overview of the ways sociologists have applied theoretical and methodological skills and understanding in sociological practice in nonacademic settings.

Prerequisites
Undergraduate senior status in sociology or graduate standing.

SOCI 516 - Internship in Sociology

Credits: 1-6
Learning experience in the application of sociological knowledge and skills in different work settings. Students work in approved setting as applied sociologists.

Prerequisites
21 credits of sociology including research methods, or permission of instructor.

Notes
Minimum 40 hours of work for every 1 credit.

SOCI 523 - Racial and Ethnic Relations: American and Selected Global Perspectives

Credits: 3
Demographic purview of U.S. racial and ethnic groups; racial and ethnic groups as human-social minority groups. Factors making for minority status including personality factors, group cultural factors; reactions of racial, ethnic minorities to minority status; programs, methods, social movements, and philosophies seeking to change minority group status.

Prerequisites
Undergraduate senior status in sociology, graduate standing, or permission of instructor.
SOCI 530 - Methods and Logic of Social Inquiry

Credits: 3
Emphasizes gathering, interpreting, and evaluating scientific evidence. Develops critical-thinking skills by using set of rules and logical criteria for evaluating social science research. Covers logic of scientific inquiry, including various data collection methods, such as observational research and experiments, types of variables, causality, and how to distinguish between good and bad research in published literature.

Prerequisites
Undergraduate senior status in sociology, or graduate status and 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 531 - Statistical Reasoning

Credits: 3
Intermediate treatment of statistical methods used in analyzing social data. Topics include sampling, inference, hypothesis testing, analysis of variance, linear regression, and correlation. Introduces logic of multivariate analysis.

Prerequisites
Graduate standing and 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 550 - The Holocaust

Credits: 3
Examines Holocaust, destruction of European Jewry, through testimonies of survivors and narratives of historians. Topics include historical and cultural circumstances that encouraged German anti-Semitism; rise of Nazism; ghettoization of Jews in Poland; Jewish life in ghettos; European Jews under Nazi occupation; Jewish resistance; Christian rescuers; invasion of Russia and mobile killing units; life in hiding and passing, forced labor camps, and concentration camps; responses of United States and world; and reflections on Holocaust today. Also considers eyewitness testimony, memory, narrative, and literature.

Prerequisites
Undergraduate senior status in sociology, or graduate status.
**SOCI 575 - Women and the Law**

Credits: 3  
Analyzes changing position of women in law from legal and sociological perspectives. Focuses on how law defines and regulates women's rights in variety of areas such as employment, marriage and divorce, reproduction and control of one's body, and violence against women. Explores social and economic consequences of various legal doctrines, and compares laws and policies in United States with those in other countries.

**Prerequisites**  
Undergraduate senior status in sociology or graduate standing

**SOCI 590 - Gender, Race, and the Natural World**

Credits: 3  
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.

**Prerequisites**  
Undergraduate seniors, graduate standing, or permission of instructor.

**SOCI 599 - Issues in Sociology**

Credits: 3  
**Cross-Listed with NURS 611**  
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.

**Prerequisites**  
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

SOCI 605 - Gender and Social Structure

Credits: 3
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

SOCI 607 - Criminology

Credits: 3
Crime and crime causation. Topics include social basis of law, administration of justice, and control and prevention of crime.

Prerequisites
Graduate standing, or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

SOCI 608 - Juvenile Delinquency

Credits: 3
Sociology of adolescent behavior. Sociological factors that determine which behaviors and social categories of adolescents are likely to be labeled and treated as delinquent.

Prerequisites
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
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.

Prerequisites
Graduate standing, or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

SOCI 611 - Classical Sociological Theory

Credits: 3
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.

Prerequisites
Graduate standing or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

SOCI 612 - Contemporary Sociological Theory

Credits: 3
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.

Prerequisites
Graduate standing, or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0
SOCl 614 - Sociology of Culture

Credits: 3
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.

Prerequisites
Graduate standing, or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

SOCl 616 - Internship in Sociology

Credits: 1-6
Provides learning experiences in application of sociological knowledge and skills in different work settings. Students work in approved setting as applied sociologists.

Prerequisites
Graduate standing.

Notes
Each credit requires minimum of 40 hours of work.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
0

SOCl 619 - Conflict and Conflict Management: Perspectives from Sociology

Credits: 3
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.

Prerequisites
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  
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.

**Prerequisites**  
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 630 - Analytic Techniques of Social Research**

Credits: 3  
Focuses on general linear model and multiple regression analysis in nonexperimental data. Topics include logic of causal analysis, multicollinearity, influential observations, categorical independent and dependent variables, violation of assumptions, missing data, structural equation and measurement models, and discrete multivariate analysis.

**Prerequisites**  
Graduate standing and 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 631 - Survey Research**

Credits: 3  
Introduces theory, method, and practice of survey research design and analysis. Students complete survey research project.

**Prerequisites**  
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
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.

Prerequisites
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
Prerequisites
Graduate standing, or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

SOCI 634 - Qualitative Research Methods

Credits: 3
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.

Prerequisites
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
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.
Prerequisites
Graduate standing.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

SOCI 636 - Statistical Reasoning

Credits: 3
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.

Prerequisites
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

Credits: 3
Major theories of social organization and social change as means of understanding social policy development. Concentration is on social policies in American society.

Prerequisites
Graduate standing, or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

SOCI 650 - Issues in the Sociology of Health, Illness, and Disability

Credits: 3
Social context of disease and medical care, position of professions in medical care structure, delivery of medical care, and physician-patient relationship under different systems of practice.

Prerequisites
Graduate standing, or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0
SOCI 651 - Health Care Systems

Credits: 3
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.

Prerequisites
Graduate standing, or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

SOCI 660 - Historical and Comparative Sociology

Credits: 3
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.

Prerequisites
Graduate standing, or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

SOCI 686 - Sociology of Aging

Credits: 3
Analyzes sociological issues in aging, including class and cultural factors, problems of work, retirement, attachment and loss, and ageism. Examines different theories of aging.

Prerequisites
Graduate standing, or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0
**SOCl 692 - McDonaldization of Organizations**

Credits: 3  
Examines classical and contemporary theories and analysis governing formal organizations, their development, and characteristics and relationships to society. Considers alternative conceptualizations to bureaucracy such as learning organizations, self-help groups, feminist collectives, cooperatives, and social movement organizations. Nonprofit, governmental, and business organizations are dissected.

**Prerequisites**  
Graduate standing, or permission of instructor.

**Hours of Lecture or Seminar per week**  
3  
**Hours of Lab or Studio per week**  
0

**SOCl 696 - Independent Study**

Credits: 3  
Theoretical and research literature chosen by student and instructor.

**Prerequisites**  
Graduate standing, or permission of instructor.

**Hours of Lecture or Seminar per week**  
0  
**Hours of Lab or Studio per week**  
0

**SOCl 697 - Independent Study**

Credits: 3  
Theoretical and research literature chosen by student and instructor.

**Prerequisites**  
Graduate standing, or permission of instructor.

**Hours of Lecture or Seminar per week**  
0  
**Hours of Lab or Studio per week**  
0

**SOCl 711 - Classical Sociological Theory**
Credits: 3
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
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
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.

**Prerequisites**
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 797 - Sociology Colloquium**

Credits: 0
Public forum for the presentation and discussion of contemporary sociological research.

**Prerequisites**
Graduate standing or permission of instructor.

**Hours of Lecture or Seminar per week**  
0
SOCI 799 - Thesis

Credits: 1-6

Hours of Lecture or Seminar per week
0

Hours of Lab or Studio per week
0

Grading
S/NC

SOCI 800 - Studies for the Doctor of Philosophy in Education

Credits: variable

Program of studies designed by student's discipline director and approved by student's doctoral committee, which brings student to participate in current research of discipline director and results in paper reporting original contributions of the student.

Prerequisites
Admission to PhD in education program to study in sociology.

Notes
Enrollment may be repeated.

SOCI 801 - Proseminar in Public and Applied Sociology

Credits: 3

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

SOCI 802 - Proseminar in Public and Applied Sociology II

Credits: 3

The second in a two-semester sequence that provides students with an introduction to the theories, methods, and practice of public and applied sociology as they are relevant to issues of societal and community importance. Builds on the historical and contextual understandings of the first semester by examining contemporary issues and challenges such as university and
community relationships, activism and research, ethical dilemmas of engaged research, and methodological debates.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**SOCI 803 - Institutions and Inequality**

Credits: 3
Analyzes the interrelations between social inequalities and institutional structures, including markets, the press, prisons, mental institutions, cultural organizations, and corporations.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**SOCI 804 - Sociology of Globalization**

Credits: 3
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.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**SOCI 840 - Work Organizations and Social Inequality**

Credits: 3
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.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0
**SOCI 844 - Youth, Schooling, and Popular Culture**

Credits: 3
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
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
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
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

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**SOCI 853 - Cities in a Global Society**

Credits: 3

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.

**Hours of Lecture or Seminar per week**

3

**Hours of Lab or Studio per week**

0

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**SOCI 857 - Sociology of Human Rights**

Credits: 3

Examines the connections among inequality, conflict, social justice, and human rights in an age of globalization. Drawing from case studies from around the world, 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

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**SOCI 860 - Historical and Comparative Sociology**

Credits: 3

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.

**Prerequisites**

Graduate standing, or permission of instructor.

**Hours of Lecture or Seminar per week**

3
**SOCI 870 - Directed Readings Sociology**

Credits: 3  
Prerequisites: 6 credits of 600-level SOCI courses. Intensive reading course to develop comprehensive understanding of specific field in sociology as agreed on with advisor.

**Notes**  
Content varies. May be repeated.

**SOCI 880 - Independent Study in Sociology**

Credits: 3  
Prerequisite: 6 credits of 600-level SOCI courses. Reading and research on selected topic, resulting in a written project as agreed on with supervising faculty.

**Notes**  
Content varies. May be repeated.

**SOCI 998 - Doctoral Dissertation Proposal**

Credits: 1-6  
Work on research proposal for doctoral dissertation.

**Prerequisites**  
Successful completion of all course work and doctoral comprehensive exams.

**Notes**  
Course may be repeated once for credit for total of 6 credits.
**SOCI 999 - Doctoral Dissertation**

Credits: 1-12
Doctoral dissertation research and writing on approved dissertation topic under direction of committee.

**Prerequisites**
Successful completion of SOCI 998.

**Notes**
Maximum of 12 credits may be applied toward degree.

**Hours of Lecture or Seminar per week**
0

**Grading**
S/NC

**SOCW 110 - Global Perspectives on Human Rights**

Credits: 3
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
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
SOCW 301 - Laboratory in Interpersonal Communication

Credits: 4
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.

Prerequisites
SOCI 101, PSYC 100, and sophomore standing; or permission of instructor.

Notes
Service learning of at least 60 hours required.

SOCW 323 - Human Behavior in the Social Environment I

Credits: 3
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.

Prerequisites
SOCI 101, BIOL 103, and PSYC 100; or permission of instructor; completion or concurrent enrollment in all other required general education course work.

Notes
Open to all majors.

SOCW 324 - Human Behavior in the Social Environment II

Credits: 3
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.

Prerequisites
SOCW 323 with a minimum grade of C, or permission of instructor
SOCW 351 - Social Policy and Social Justice I

Credits: 3
Introduces social welfare policy, including historical development, central concepts, institutional nature, and origins of social work as profession. Analyzes service delivery systems and role of social work profession in bringing about social and economic change.

Prerequisites
SOCI 101 and GOVT 103; or permission of instructor.

Notes
Open to all majors.

SOCW 352 - Social Policy and Social Justice II

Credits: 3
Analyzes various social welfare policies and their development; examines how policies have emerged in response to social problems arising out of changing social, political, economic, and cultural influences.

Prerequisites
SOCW 351 with minimum grade of C, or permission of instructor.

SOCW 357 - Methods of Social Work Intervention I

Credits: 3
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.

Prerequisites
SOCI 101, PSYC 100, or permission of instructor
Prerequisites/Corequisites
SOCW 200

Notes
SOCW majors only.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

SOCW 358 - Methods of Social Work Intervention II

Credits: 3
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.

Prerequisites
60 credits, or permission of instructor.

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
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.

Prerequisites
SOCW 301

Corequisite
Must be taken simultaneously with SOCW 358.

Notes
Forty hours of service learning are required.

Hours of Lecture or Seminar per week
1
Hours of Lab or Studio per week
0
**SOCW 400 - Legal and Ethical Issues in Human Services**

Credits: 3  
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.

**Prerequisites**  
42 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  
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.

**Prerequisites**  
42 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  
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.

**Prerequisites**  
42 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
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.

Prerequisites
SOCW 301, 357, 358, 359, 452, 453

Notes
For social work majors only.

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
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.

Prerequisites
42 credits, or permission of 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
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.

Prerequisites
43 credits, or permission of instructor.

Hours of Lecture or Seminar per week
3
SOCW 430 - Social Work and the Law

Credits: 3
Introduces social worker's role in legal system, and familiarizes students with legal processes and application to issues of interest to social workers and clients, including child abuse, foster care, reproductive rights, juvenile justice, and legal rights of the poor, women, and minorities.

Prerequisites
44 credits, or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

SOCW 435 - An Intergenerational Approach to Aging

Credits: 3
Surveys issues related to working with aged, their families, and care providers. Studies biological, psychological, and sociocultural aspects of aging, and unique problems with service delivery to aged persons. Examines forces that impinge on aged person, and explores critical issues related to extended life span, family changes, institutionalization, and role of aged persons in society. Students increase their sensitivity and knowledge of aged individuals through intergenerational lens.

Prerequisites
45 credits, or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

SOCW 452 - Senior Seminar I

Credits: 2
Provides integrative team experience to support field experience and provide opportunities to demonstrate required competencies through special assignments.

Prerequisites
SOCW 200, 301, 323, 324, 351, 352, 357, 358, and 359 with grade of C or better and recommendation of faculty.

Corequisite
Concurrent with Senior Practicum I (SOCW 453).
Notes
Open only to social work majors.

**SOCW 453 - Senior Practicum I**

Credits: 3
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.

**Prerequisites**
SOCW 200, 301, 323, 324, 351, 352, 357, 358, and 359 with grade of C or and recommendation of faculty.

Notes
Open only to social work majors. Requires concurrent seminar (SOCW 452) participation and faculty-agency visits.

**SOCW 454 - Senior Seminar II**

Credits: 2
Continuation of integrative team experience designed to support practicum experience and provide opportunities to demonstrate required competencies through special assignments.

**Prerequisites**
SOCW 452, 453, 471 with a grade of C or better.

**Corequisite**
SOCW 456

**Hours of Lecture or Seminar per week**

**SOCW 456 - Senior Practicum II**

Credits: 3
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.

**Prerequisites**

**Corequisite**
SOCW 454

**Notes**
Requires concurrent seminar participation (SOCW 454) and faculty-agency visits. Open to SOCW majors only.
**SOCW 471 - Research in Social Work**

Credits: 3  
Must be completed with minimum grade of C. 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.

**Prerequisites**  
SOCI 313 or PSYC 300; SOCW 200, 301, 323, 351, 357; senior standing or permission of the instructor

**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  
In-depth study of special areas of social work of interest to students, faculty, and social work community.

**Prerequisites**  
45 credits, or permission of instructor.

**Notes**  
Topics vary.

**Hours of Lecture or Seminar per week**  
3

**Hours of Lab or Studio per week**  
0

**SOCW 483 - Selected Approaches to Social Work Intervention**

Credits: 3  
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.

**Prerequisites**  
45 credits, or permission of instructor.

**Notes**  
May be taken more than once for credit. 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
Investigates research problem in field of social work.

Prerequisites
60 credits and research proposal approved by instructor before enrollment.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
0

SOCW 598 - Special Topics in Social Work

Credits: 1-6
Prerequisites
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
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.

Prerequisites
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
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.

Prerequisites
SOCW 623.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**SOCW 630 - Forensic Social Work Practice**

Credits: 4
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.

**Prerequisites**
SOCW 624, 652, 658, and 673.

**Hours of Lecture or Seminar per week**
4

**Hours of Lab or Studio per week**
0

**SOCW 640 - Advanced Clinical Practice**

Credits: 4
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.

**Prerequisites**
SOCW 623, 624, 651, 652, 657, 658, 670, 671, 672, 673 and 680

**Hours of Lecture or Seminar per week**
4

**Hours of Lab or Studio per week**
0

**SOCW 645 - Community-Centered Clinical Practice**

Credits: 4
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.

**Prerequisites**
SOCW 624, 652, 658, and 673.
SOCW 651 - Social Policies, Programs, and Services

Credits: 3
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.

Prerequisites
Graduate standing

SOCW 652 - Influencing Social Policy

Credits: 3
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.

Prerequisites
SOCW 651.

SOCW 657 - Direct Social Work Practice I

Credits: 3
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.

Prerequisites
Graduate standing and open only to students enrolled in MSW degree program.

Corequisite
SOCW 672.
SOCW 658 - Direct Social Work Practice II

Credits: 3
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.

Prerequisites
SOCW 657; Open to students enrolled in MSW degree program

Corequisite
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
Studies various forms of written communication pertinent to social work practice. Examines impact of audience, status, culture, and purpose on effective professional writing.

Prerequisites
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
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.

Prerequisites
SOCW 624 and 652.

Hours of Lecture or Seminar per week
SOCW 672 - Foundation Field Practicum and Seminar I

Credits: 3
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
SOCW 657.

SOCW 673 - Foundation Field Practicum and Seminar II

Credits: 3
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.

Prerequisites
SOCW 672.

Corequisite
SOCW 658.

SOCW 674 - Psychopathology

Credits: 4
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.

Prerequisites
SOCW 623, 624, 651, 652, 657, 658, 670, 671, 672, 673

Notes
SOCW 675 - Selected Topics in Clinical Practice

Credits: 3
In-depth study of special topics related to clinical social work practice at the individual, family, small group, or community level.

Prerequisites
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: 4
Critical examination of special topics related to understanding and improving community and societal conditions through policy practice, program development, and social action.

Prerequisites
30 graduate credits or permission of instructor.

Hours of Lecture or Seminar per week
4
Hours of Lab or Studio per week
0

SOCW 680 - Clinical Field Practicum

Credits: 6
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.

Prerequisites
SOCW 673, 630, 640, 645, and 688

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
0
**SOCW 681 - Clinical Field Seminar**

Credits: 3  
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**  
SOCW 680.

**Hours of Lecture or Seminar per week**  
0

**Hours of Lab or Studio per week**  
0

**SOCW 684 - Social Work and the Law**

Credits: 4  
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.

**Prerequisites**  
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: 4  
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.

**Prerequisites**  
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**

Credits: 4  
Explores social work interventions at community level, including organization, planning, and development. Strategies for mobilizing community members, using community organizations, formulating coalitions, engaging in participatory planning, and social and economic development.

**Prerequisites**  
SOCW 624, 652, 658, and 673.

**Hours of Lecture or Seminar per week**  
3  
**Hours of Lab or Studio per week**  
0

**SOCW 688 - Advanced Research in Social Work**

Credits: 3  
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.

**Prerequisites**  
SOCW 624, 652, 658, 671, and 673.

**Hours of Lecture or Seminar per week**  
3  
**Hours of Lab or Studio per week**  
1

**SOCW 690 - Social Change Field Practicum**

Credits: 6  
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.

**Prerequisites**  
SOCW 673, 684, 685, 687, and 688.

**Hours of Lecture or Seminar per week**  
0  
**Hours of Lab or Studio per week**  
0

**SOCW 691 - Social Change Field Seminar**
Credits: 3
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
SOCW 690.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
0

SOCW 692 - Clinical Practicum I

Credits: 4
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.

Prerequisites
SOCW 623, 624, 651, 652, 657, 658, 670, 671, 672, 673

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
0
When Offered
F

SOCW 693 - Clinical Practicum II

Credits: 4
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.

Prerequisites
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
0
Hours of Lab or Studio per week
0
When Offered
S

SOCW 694 - Social Change Practicum I

Credits: 4
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.

Prerequisites
SOCW 623, 624, 651, 652, 657, 658, 670, 671, 672, 673

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
0
When Offered
F

SOCW 695 - Social Change Practicum II

Credits: 4
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.

Prerequisites

Notes
Continuation of SOCW 693 from the Fall semester.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
0
When Offered
S

SOCW 697 - Thesis Project Seminar

Credits: 3
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.

Prerequisites
Social Change: 684, 685, 688
Clinical Practice: 630-688

Corequisite
Social Change: 676, 687
Clinical Practice: 640, 645

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
Investigates research problem in field of social work.

Prerequisites
Graduate standing.

Hours of Lecture or Seminar per week
0

Hours of Lab or Studio per week
0

SOM 100 - Business in American Society

Credits: 3
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.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

SOM 301 - Business Models: A Learning by Writing Introduction

Credits: 3
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.

**Corequisite**
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

**Hours of Lab or Studio per week**
0

**When Offered**
Fall, Spring, Summer.

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**SOM 492 - Undergraduate Internship**

Credits: 3
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.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

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**SOM 498 - Capstone Course: Advanced Business Models**

Credits: 3
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.

**Prerequisites**
ACCT 301, BULE 302, OM 301, FNAN 301, MGMT 301, MIS 301, and MKTG 301; and senior standing.

**Notes**
Fulfills synthesis requirement for SOM majors.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

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**SPAN 101 - Elementary Spanish I**
Credits: 3
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
Continuation of SPAN 101. Lab work required.

Prerequisites
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 105 - Review of Elementary Spanish

Credits: 3
Review of elements of Spanish for students who have studied Spanish previously.

Prerequisites
Appropriate placement score, or permission of department.

Notes
Lab work required. Students may not receive credit for SPAN 105 and SPAN 101, 102, 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
Recommended for students who desire an intensive introduction to Spanish.

Prerequisites
Equivalent to SPAN 101 and 102 taught in a single semester.

Notes
Lab work required. 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
2

SPAN 110 - Elementary Spanish
Credits: 6

Introduces elements of grammar, vocabulary, oral skills, listening comprehension, and reading. Students may not receive credit for SPAN 110 if they have received credit for SPAN 101, 102, or 109.

Notes
Lab work required. Students may not receive credit for SPAN 110 and SPAN 101, 102, 105, or 109.

Hours of Lecture or Seminar per week
6
Hours of Lab or Studio per week
1

SPAN 201 - Intermediate Spanish I
Credits: 3
Further development of skills in listening, speaking, reading, and writing. SPAN 201 and 202 must be taken in sequence. Lab work required.

Prerequisites
SPAN 102, 105, 109, 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
Application of skills to reading, composition, and discussion. Lab work required.

Prerequisites
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

Equivalent to SPAN 201 and 202 taught in a single semester.

Prerequisites
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

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.
Prerequisites
SPAN 110 or appropriate placement score.

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
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.

Prerequisites
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
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.

Prerequisites
SPAN 202, 209, appropriate placement score, or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

SPAN 305 - Spanish in Context I

Credits: 3
Students cannot receive credit for SPAN 305 if they receive credit for SPAN 309. 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.

**Prerequisites**
SPAN 250 or equivalent, or permission of instructor.

**Notes**
Conducted in Spanish.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

### SPAN 306 - Spanish in Context II

Credits: 3
Students cannot receive credit for SPAN 306 if they receive credit for SPAN 309. Continuation of SPAN 305.

**Prerequisites**
SPAN 305 or equivalent, or permission of instructor.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

### SPAN 309 - Intensive Spanish in Context

Credits: 6
Students cannot receive credit for both SPAN 309 and SPAN 305 or 306. 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.

**Prerequisites**
SPAN 250 or equivalent, or permission of instructor.

**Notes**
Conducted in Spanish.

**Hours of Lecture or Seminar per week**
6

**Hours of Lab or Studio per week**
0
SPAN 315 - Spanish for Heritage Speakers

Credits: 3
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.

Prerequisites
Appropriate placement score or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

SPAN 321 - Introduction to Spanish Culture

Credits: 3
History, culture, economic and social development, and scientific and artistic achievements that have contributed to the formation of modern Spain.

Prerequisites
ENGL 101 or equivalent, or permission of instructor.

Notes
Designed for nonmajors. Course work in English. Credit may be earned in either SPAN 321 or 461, but not in both.

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
History, culture, economic and social development, and scientific and artistic achievements that have contributed to the formation of modern Latin America.

Prerequisites
ENGL 101 or equivalent, or permission of instructor.

Notes
Designed for nonmajors. Course work in English. Credit may be earned in either SPAN 322 or 466, but not in both.

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
Study tour to area of Spanish-speaking world. Students must attend a series of lectures before the tour, and must consult with the designated faculty member on a research project on a topic in Hispanic culture resulting in paper or report.

Prerequisites
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
Study at an academic institution in a Spanish-speaking country including classroom studies with professors from the host country and field experiences.

Prerequisites
SPAN 250 or equivalent; appropriate placement score; 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
Study of the works of major Hispanic writers in translation. Writers studied vary.

Prerequisites
ENGL 101 or equivalent, or permission of instructor.

Notes
Designed for nonmajors. Course work in English. May be taken toward fulfillment of the general requirement in literature for baccalaureate degrees. 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 326 - Treasures of Spanish American Literature

Credits: 3
Introduction to the major themes, trends, and cultural context of Latin American literature. Writers studied vary.

Prerequisites
Advanced oral and written proficiency in Spanish, to be determined by the instructor.

Notes
Designed for nonmajors. May be repeated for credit 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
Course work in English. May be taken toward fulfillment of the humanities requirement in literature for baccalaureate degrees.

Prerequisites
ENGL 101, or permission of instructor.

Notes
Designed for nonmajors. May be repeated once for credit.

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
Integrated content-based approach to conversational Spanish. Designed to promote increased confidence and fluency in both form 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. Conducted in Spanish.

Prerequisites
SPAN 306, 309 or 315.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0
SPAN 336 - Topics for Proficiency: Spain

Credits: 3
Integrated content-based approach to conversational Spanish. Designed to promote increased confidence and fluency in both form 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. Conducted in Spanish.

Prerequisites
SPAN 306, 309 or 315

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

SPAN 351 - Oral Spanish

Credits: 3
Development of oral expression on topics of current interest and everyday situations, including written assignments.

Prerequisites
SPAN 250 or equivalent; appropriate placement score; or permission of instructor.

Notes
Not open to native speakers.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

SPAN 370 - Spanish Writing and Stylistics

Credits: 3
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.

Prerequisites
SPAN 306 or 309, or 315, or permission of instructor.

Notes
Conducted 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  
Introduces study of Spanish linguistics, including phonetics, phonology, morphology, syntax, pragmatics, historical linguistics, and sociolinguistics. Combines discussion of theoretical issues with linguistic analysis of Spanish.

**Prerequisites**  
SPAN 301, 302, or advanced ability in Spanish; or permission of instructor.

**Notes**  
Conducted 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  
Completion or concurrent enrollment in all other required general education courses. 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.

**Prerequisites**  
SPAN 335 or 336, and SPAN 370, or equivalents.

**Notes**  
Conducted 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  
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.

**Prerequisites**  
SPAN 302, or permission of instructor.

**Hours of Lecture or Seminar per week**  
3
**SPAN 400 - Spanish for the Professions**

Credits: 3  
Advanced study of the language needed for use in a specific profession, such as translation, business, social service, or health professions.

**Prerequisites**  
SPAN 302, or permission of instructor.

**Notes**  
May be repeated for credit with change of topic.

**SPAN 425 - Independent Study**

Credits: 1-3  
Research and analysis of a selected problem in literature or linguistics in consultation with a department member.

**Prerequisites**  
Spanish major with 90 credits, and permission of instructor.

**Notes**  
Maximum of 6 credits of independent study may be applied to fulfillment of major requirements.

**SPAN 426 - Independent Study**

Credits: 1-3  
Research and analysis of a selected problem in literature or linguistics in consultation with a department member.

**Prerequisites**  
Spanish major with 90 credits, and permission of instructor.

**Notes**  
Maximum of 6 credits of independent study may be applied to fulfillment of major requirements.
SPAN 430 - Spanish in the United States

Credits: 3
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.

Prerequisites
SPAN 302 and 351, or advanced ability in Spanish, or permission of instructor.

Hours of Lecture or Seminar per week
3

SPAN 452 - Advanced Written Spanish

Credits: 3
Development of skills required in writing Spanish. Guided and original compositions. Grammatical structures reviewed and supplemented with individual corrections.

Prerequisites
9 credits of SPAN at 300 level or above, or permission of instructor.

Hours of Lecture or Seminar per week
3

SPAN 455 - Spanish-English Translation

Credits: 3
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.

Prerequisites
SPAN 370 and ENGL 302; or permission of instructor.

Hours of Lecture or Seminar per week
SPAN 461 - Spanish Civilization and Culture

Credits: 3
Survey of Spanish culture and civilization from pre-Roman era to the 20th century.

Prerequisites
SPAN 452, or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

SPAN 466 - Latin American Civilization and Culture

Credits: 3
Introduction to the study of Latin American civilization and culture from the pre-Columbian era to the 20th century.

Prerequisites
SPAN 452, or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

SPAN 472 - Spanish Phonetics and Phonology

Credits: 3
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.

Prerequisites
SPAN 385 or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0
SPAN 474 - Spanish Syntax and Semantics

Credits: 3
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.

Prerequisites
SPAN 385 or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

SPAN 476 - Teaching Spanish in the United States

Credits: 3
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.

Prerequisites
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
Study of a selected theme in Hispanic literature, culture, or linguistics.

Prerequisites
SPAN 452, or permission of instructor.

Notes
May be repeated for credit with change of topic.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0
**SPAN 481 - Special Topics in Spanish**

Credits: 3  
Study of a selected theme in Hispanic literature, culture, or linguistics.

**Prerequisites**  
SPAN 452, or permission of instructor.

**Notes**  
May be repeated for credit with change of topic.

**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  
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.

**Prerequisites**  
SPAN 390 and 452 or permission of instructor

**Notes**  
SPAN 484 studies Spanish literature from 1700 to the present.

**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  
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.

**Prerequisites**  
SPAN 390 and 452 or permission of instructor; SPAN 483.

**Notes**  
SPAN 484 studies Spanish literature from 1700 to the present.

**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
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.

Prerequisites
SPAN 452 or SPAN 370 and 390 or permission of instructor.

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
Interdisciplinary examination and discussion of major topics in literary texts and cultural practices of Latin America from the late 19th century to the present.

Prerequisites
SPAN 452 or SPAN 370 and 290; or permission of instructor

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
Survey of the literature of Spanish America. Study of texts that are representative of the colonial, romantic, modernista, avant garde, and contemporary periods.

Prerequisites
SPAN 390 and 452, or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

SPAN 490 - Internship in Spanish
Credits: 1-6
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.

Prerequisites
9 credits in Spanish at the 300 level, or permission of instructor.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
0

SPAN 497 - Senior Honors Tutorial

Credits: 3
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.

Prerequisites
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
0
Hours of Lab or Studio per week
0

SPAN 498 - Senior Honors Tutorial

Credits: 3
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.

Prerequisites
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
0
Hours of Lab or Studio per week
0
SPAN 500 - History of the Spanish Language

Credits: 3
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
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
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
Study of creative writing, its form and expression, through text analysis from selected genres: novel, essay, drama, short story, and poetry. Practice in creative writing through exercises, composition, and workshops.

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
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.

Prerequisites
Graduate standing in master's program in foreign languages, or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

SPAN 520 - Studies in Medieval Spanish Literature

Credits: 3
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
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
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
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
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
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
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
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
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.

Prerequisites
Graduate standing or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

SPAN 580 - Contemporary Hispanic Institutions

Credits: 3
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.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

SPAN 635 - Seminar in Don Quixote

Credits: 3
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
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
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
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
Comparative analysis of a literary theme or style in relation to other media (painting, architecture, film) for an integral understanding of the arts.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

SPAN 680 - Seminar in Literature and Society

Credits: 3
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.
SPAN 685 - Seminar in Literature and Ideas

Credits: 3
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
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
0
Hours of Lab or Studio per week
0

SPAN 799 - Thesis

Credits: 1-6
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
0
Hours of Lab or Studio per week
0
Grading
S/NC

SPAN 800 - Studies for the Doctor of Philosophy in Education

Credits: variable
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.

**Prerequisites**
Admission to PhD in education program to study in Spanish.

**Notes**
Enrollment may be repeated.

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**SPMT 201 - Introduction to Sport Management**

Credits: 3
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

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**SPMT 241 - Practicum**

Credits: 3
Paid or voluntary experience in sport industry setting. Work sites chosen by students after receiving approval of faculty supervisors.

**Prerequisites**
SPMT 201

**Notes**
Open to majors and minors only.

**Hours of Lecture or Seminar per week**
0

**Hours of Lab or Studio per week**
3

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**SPMT 302 - Sport and Ethics**

Credits: 3
Investigates moral issues in sport and judgments about right and wrong behavior among athletes, coaches, spectators, and others.

**Prerequisites**
SPMT 201 and 60 hours or permission of instructor
SPMT 304 - Sport, Culture, and Society

Credits: 3
Analyzes sport from educational, political, economic, and cultural perspectives.

Prerequisites
PHED 200 or permission of instructor

SPMT 318 - Gender and Racial Issues in Sport

Credits: 3
Investigates dominant gender and racial ideologies, and their influence on sport.

SPMT 320 - Psychology of Sport

Credits: 3
Psychological theories of personality, motivation, and anxiety explored in sport environment. Examines social-psychological research on audience effects, team cohesion, leadership, and fan behavior.

SPMT 321 - America Through Baseball

Credits: 3
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.

**SPMT 322 - Football and American Culture**

Credits: 3  
Description: This course is designed for the student to gain an understanding of the past and present role of football in American culture. The course 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.

**SPMT 323 - America and the Modern Olympics**

Credits: 3  
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.

**SPMT 405 - Sport Operation and Planning**

Credits: 3  
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.
**SPMT 412 - Sport Marketing and Finance**

Credits: 3
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.

**Prerequisites**
SPMT 201 and PRLS 411, 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
Examines the principles of economics, budgeting, and finance as it applies to the sport industry.

**Prerequisites**
Completion of 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 430 - Sport Communication**

Credits: 3
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.

**Prerequisites**
60 hours, including SPMT 201, PHED 200, and the general education communication requirement, or permission of instructor

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**SPMT 440 - Global Perspectives in Sport**

Credits: 3
This course is an interdisciplinary examination of sport as a global phenomenon. Historical, cultural, economic, and governance
perspectives are considered.

**Prerequisites**
60 hours, including SPMT 304, or permission of instructor

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

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**SPMT 455 - Governance and Policy in Sport Organizations**

Credits: 3
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.

**Prerequisites**
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

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**SPMT 475 - Sport Management Professional Development Seminar**

Credits: 3
This is a seminar format in which students synthesize and apply theories, concepts, and practices in the leadership and management of sport organizations.

**Prerequisites**
90 hours, including SPMT 241 and PHED 200, and a minimum of 40 hours in SRHT

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

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**SPMT 480 - Special Topics in Sport Management**

Credits: 3
See course description in the Schedule of Classes. Selected topics reflecting interest in specialized areas of sport management. Announced in advance.

**Prerequisites**
60 credits
SPMT 490 - Internship

Credits: 12
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.

Prerequisites
90 hours (pass/fail), HEAL 323, PHED 200, PRLS 410, SPMT 304, and SPMT 405

SPMT 499 - Independent Study

Credits: 1-3
Faculty-directed independent study of approved topics in sport management.

STAT 250 - Introductory Statistics I

Credits: 3
Elementary introduction to statistics. Topics include descriptive statistics, probability, and estimation and hypothesis testing for means and proportions. Statistical software used for assignments.

Prerequisites
High school algebra.

When Offered
F, S, SUM
STAT 344 - Probability and Statistics for Engineers and Scientists I

Credits: 3
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, correlation and least squares estimation, central limit theorem, sampling distributions, maximum likelihood and unbiased estimators, confidence interval construction, and hypothesis testing.

Prerequisites
MATH 114.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0
When Offered
F, S, SUM

STAT 346 - Probability for Engineers

Credits: 3
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.

Prerequisites
MATH 213

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0
When Offered
F, S

STAT 350 - Introductory Statistics II

Credits: 3
Emphasis on applications. Topics include analysis of variance, multiple regression, and nonparametric inference. A statistical computer package is used for data analysis.

Prerequisites
STAT 250.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0
When Offered
F, S

STAT 354 - Probability and Statistics for Engineers and Scientists II

Credits: 3
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.

Prerequisites
STAT 344.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

When Offered
S

STAT 362 - Introduction to Computer Statistical Packages

Credits: 3
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.

Prerequisites
STAT 250 or equivalent

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

When Offered
F

STAT 435 - Analysis of Experimental Data Using SPSS

Credits: 3
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.

Prerequisites
STAT 250 or equivalent.

Hours of Lecture or Seminar per week
3
STAT 455 - Experimental Design

Credits: 3
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 $2^k$ experiments; or estimation of variance components. Computer statistical packages are used to perform computations.

Prerequisites
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
IR

STAT 457 - Applied Nonparametric Statistics

Credits: 3
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.

Prerequisites
STAT 350 or 354, or equivalent.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0
When Offered
IR

STAT 463 - Introduction to Exploratory Data Analysis

Credits: 3
Introduction to modern exploratory data analysis techniques. Topics include graphical techniques, such as box plots, parallel coordinate plots, and other graphical devices, re-expression and transformation of data, order statistics, influence and leverage, and dimensionality reduction methods such as projection pursuit.
Prerequisites
STAT 350 or 354, or equivalent.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

When Offered
IR

STAT 474 - Introduction to Survey Sampling

Credits: 3
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.

Prerequisites
STAT 350 or 354 and STAT 362 or permission of instructor.

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
F

STAT 498 - Independent Study in Statistics

Credits: 1-3
Directed self-study of special topics of current interest in statistics.

Prerequisites
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
0

Hours of Lab or Studio per week
0
STAT 499 - Special Topics in Statistics

Credits: 3
Topics of special interest to undergraduates.

Prerequisites
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
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.

Prerequisites
Course in statistics and experience with Microsoft OS.

Notes
At most one of STAT 501-503 can be applied to certificate programs in statistics.

Hours of Lecture or Seminar per week
1

Hours of Lab or Studio per week
0

When Offered
S

STAT 502 - Introduction to SAS/GRAPH

Credits: 1
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 SAS/GRAPH and SAS/GRAPH procedures, SAS/GRAPH output options and in-depth coverage of the GOPTIONS, GDEVICE, GCHART, GPLOT, and GSLIDE procedures.

Prerequisites
Working knowledge of SAS.

Notes
At most one of STAT 501-503 can be applied to certificate programs in statistics.
STAT 503 - SAS Macro Language

Credits: 1
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.

Prerequisites
Working knowledge of SAS.

Notes
At most one of STAT 501-503 can be applied to certificate programs in statistics.

STAT 535 - Analysis of Experimental Data Using SPSS

Credits: 3
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.

Prerequisites
STAT 250 or equivalent.

Notes
Can be used to satisfy requirements for certificates in federal statistics and biostatistics, but not MS in statistical science. Certificate program students granted credit for only one of STAT 535 or 554.
STAT 544 - Applied Probability

Credits: 3
Course in probability with applications in computer science, engineering, operations research, and statistics. Random variables and expectation, multivariate and conditional distributions, conditional expectation, order statistics, transformations, moment generating functions, special distributions, limit theorems.

Prerequisites
MATH 213 and STAT 346, or permission of instructor.

Hours of Lecture or Seminar per week
3

When Offered
F, S

STAT 554 - Applied Statistics

Credits: 3
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.

Prerequisites
STAT 346 or permission of instructor.

Notes
Certificate program students granted credit for only one of STAT 535 or 554.

Hours of Lecture or Seminar per week
3

When Offered
F, S

STAT 574 - Survey Sampling I

Credits: 3
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.

Prerequisites
STAT 354 or 554.
Corequisite
STAT 501 or working knowledge of SAS.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

When Offered
F

STAT 634 - Case Studies in Data Analysis

Credits: 3
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.

Prerequisites
STAT 554 and working knowledge of SAS, or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

When Offered
IR

STAT 645 - Stochastic Processes

Credits: 3
Cross-Listed with OR 645

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.

Prerequisites
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

STAT 652 - Statistical Inference
Credits: 3

Cross-Listed with CSI 672

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.

Prerequisites
STAT 544, ECE 528, or equivalent.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

When Offered
S

STAT 655 - Analysis of Variance

Credits: 3
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.

Prerequisites
STAT 544 and working knowledge of SAS.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

When Offered
AS

STAT 656 - Regression Analysis

Credits: 3
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.

Prerequisites
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

When Offered
F
STAT 657 - Nonparametric Statistics

Credits: 3
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.

Prerequisites
STAT 544 and 554.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

When Offered
AF

STAT 658 - Time Series Analysis and Forecasting

Credits: 3
Cross-Listed with CSI 678

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.

Prerequisites
STAT 544 or equivalent.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

When Offered
AF

STAT 660 - Biostatistical Methods

Credits: 3
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.

Prerequisites
STAT 554 or STAT 535 and a working knowledge of a statistical software package, such as SAS or SPSS.
STAT 662 - Multivariate Statistical Methods

Credits: 3
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.

Prerequisites
STAT 554 and working knowledge of SAS.

STAT 663 - Statistical Graphics and Data Exploration

Credits: 3
Cross-Listed with CSI 773

Exploratory data analysis provides a reliable alternative to classical statistical techniques that 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.

Prerequisites
A 300-level course in statistics (STAT 554 is strongly recommended).

STAT 664 - Bayesian Inference and Decision Theory
Cross-Listed with SYST 664

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.

Prerequisites
STAT 544 or 554, or equivalent.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

When Offered
S

STAT 665 - Categorical Data Analysis

Credits: 3
Analyzes cross-classified categorical data in two and higher dimensions. Familiarity with the basic test for two-way contingency tables and elementary regression and analysis of variance as presented in STAT 554 is presumed. Topics include association tests and measures of association in two- and three-dimensional contingency tables, logistic regression, and log linear models. Computer statistical package used extensively for data analysis.

Prerequisites
STAT 554, 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
AS

STAT 668 - Survival Analysis

Credits: 3
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.

Prerequisites
STAT 544, STAT 535 or 554, and working knowledge of SAS.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

When Offered
AF

STAT 673 - Statistical Methods for Longitudinal Data Analysis

Credits: 3
Presents 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.

Prerequisites
STAT 544, STAT 656, and working knowledge of a statistical software package.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

When Offered
AS

STAT 674 - Survey Sampling II

Credits: 3
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.

Prerequisites
STAT 554, STAT 574, and working knowledge of SAS.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

When Offered
AS
STAT 677 - Statistical Process Control

Credits: 3
Cross-Listed with OR 677/SYST 677

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.

Prerequisites
STAT 544 or 554, or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

STAT 678 - Reliability Analysis

Credits: 3
Cross-Listed with OR 675

Introduces 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.

Prerequisites
STAT 544 or 554, or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0
When Offered
IR

STAT 700 - Advanced Quantitative Data Analysis for Health Care Research II

Credits: 3
Multivariate analysis of variance (MANOVA, MANCOVA), multiple regression, and logistic regression. Students apply multivariate statistical methods using statistical software to analyze and interpret data in health care research.

Prerequisites
STAT 535 or HSCI 799.

Notes
Cannot be used to satisfy requirements for MS in statistical science.
STAT 701 - Advanced Multivariate Statistics and Data Analysis in Health Care Research

Credits: 3  
Coverage of discriminate analysis, canonical correlation analysis, structural analysis (LISREL and path analysis), and factor analysis.

Prerequisites  
STAT 700, HSCI 800, or equivalent.

Notes  
Cannot be used to satisfy requirements for MS in statistical science.

STAT 719 - Computational Models of Probabilistic Reasoning

Credits: 3  
Cross-Listed with OR 719/CSI 775

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.

Prerequisites  
STAT 652 or SYST/STAT 664, or permission of instructor.

STAT 751 - Computational Statistics
Credits: 3

Cross-Listed with CSI 771

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.

Prerequisites
STAT 544, STAT 554, and STAT 652.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

When Offered
AF

STAT 753 - Computer Intrusion Detection

Credits: 3

Statistical approach to computer intrusion detection. Networking basics, TCP/IP networking, network statistics, evaluation, intrusion detection, network monitoring, host monitoring, computer viruses and worms, Trojan programs and covert channels.

Prerequisites
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
IR

STAT 758 - Advanced Time Series Analysis

Credits: 3

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.

Prerequisites
STAT 658.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0
STAT 760 - Advanced Biostatistical Methods

Credits: 3
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.

Prerequisites
STAT 544, STAT 652, working knowledge of statistical programming language.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

When Offered
AS

STAT 779 - Topics in Survey Design and Analysis

Credits: 1-3
Specialized advanced topics in survey sampling building on foundations in STAT 574 and 674. Topics vary according to interest and availability of instructors but may include administrative records in analysis of data, adaptive sampling, calibration estimators, capture-recapture models, data security, establishment surveys, model-based inference, measurement error models, nonresponse models, imputation, multivariate analysis of survey data, record linkage, small area estimation, spatial sampling, survey errors and costs, telephone survey methods, variance estimation, web-based survey methods.

Prerequisites
STAT 674 or permission of instructor.

Notes
Topics may be offered in form of modules from 1 to 3 credits, with 1-credit module offered over five weeks. Up to three modules may be offered in single semester for maximum 3 credits. Students may earn up to 6 credits under different topics.

Hours of Lecture or Seminar per week
1-3

Hours of Lab or Studio per week
0

When Offered
IR

STAT 781 - Data Mining and Knowledge Discovery
Credits: 3  
**Cross-Listed with** SYST 781  

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.

**Prerequisites**  
One of the following courses: CS 687, CS 650, INFS 614, STAT 663, STAT 664, or permission of instructor.

**Notes**  
Content may vary from semester to semester.

**Hours of Lecture or Seminar per week**  
3

**Hours of Lab or Studio per week**  
0

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**STAT 789 - Advanced Topics in Statistics**

Credits: 1-6  
Topics in statistics not covered in regular statistics sequence.

**Prerequisites**  
Permission of instructor.

**Notes**  
May be repeated for credit.

**Hours of Lecture or Seminar per week**  
1-6

**Hours of Lab or Studio per week**  
0

**When Offered**  
IR

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**STAT 796 - Directed Reading and Research**

Credits: 1-3  
Reading and research on specific topic in statistics under direction of faculty member.

**Prerequisites**  
Admission to PhD in Statistical Science Program.

**Hours of Lecture or Seminar per week**  
0

**Hours of Lab or Studio per week**  
0
STAT 797 - Directed Reading and Research

Credits: 1-3
Reading and research on specific topic in statistics under direction of faculty member.

Prerequisites
Admission to PhD in Statistical Science Program.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
0

STAT 798 - Master's Essay

Credits: 3
Project chosen and completed under guidance of graduate faculty member that results in acceptable technical report.

Prerequisites
9 graduate credits, and permission of instructor.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
0

STAT 799 - Master's Thesis

Credits: 1-6
Project chosen and completed under guidance of graduate faculty member that results in acceptable technical report and oral defense.

Prerequisites
9 graduate credits, and permission of instructor.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
0

STAT 871 - Statistical Data Mining

Credits: 3
Cross-Listed with IT 871
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.

**Prerequisites**
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**
IR

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**STAT 875 - Scientific and Statistical Visualization**

Credits: 3

**Cross-Listed with** IT 875

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 three-dimensional 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.

**Prerequisites**
CS 652, STAT 554, STAT 663, or STAT 751; or permission of instructor.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**When Offered**
S

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**STAT 876 - Measure and Linear Spaces**

Credits: 3

**Cross-Listed with** IT 876/CSI 876

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.

**Prerequisites**
STAT 544 and MATH 315.
Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0
When Offered
AF

STAT 877 - Geometric Methods in Statistics

Credits: 3
Cross-Listed with IT 877/CSI 877

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.

Prerequisites
STAT 751 or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0
When Offered
IR

STAT 971 - Probability Theory

Credits: 3
Cross-Listed with IT 971

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.

Prerequisites
STAT 544 and MATH 315.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0
When Offered
S

STAT 972 - Mathematical Statistics I
Credits: 3
Cross-Listed with IT 972/CSI 972

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.

Prerequisites
STAT 652/CSI 672 or equivalent, and either STAT 876/IT 876/CSI 876 or STAT 971/IT 971.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

When Offered
F

STAT 973 - Mathematical Statistics II

Credits: 3
Cross-Listed with IT 973/CSI 973

Continuation of STAT 972/IT 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.

Prerequisites
STAT 972/IT 972/CSI 972.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

When Offered
S

STAT 998 - Doctoral Dissertation Proposal

Credits: 1-12
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
STAT 999 - Doctoral Dissertation

Credits: 1-12
Formal record of commitment to doctoral dissertation research under direction of faculty member in statistics.

Prerequisites
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.

SWE 205 - Software Usability Analysis and Design

Credits: 3
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.

Prerequisites
ENGL 101

SWE 301 - Internship Preparation

Credits: 0
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.

Prerequisites
Limited to ACS or CS majors with junior standing or permission of instructor.

**SWE 332 - Object-Oriented Software Design and Implementation**

Credits: 3  
**Cross-Listed with CS 332**

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.

**Prerequisites**
Grade of C or better in CS 211

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**SWE 401 - Internship Reflection**

Credits: 1  
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.

**Prerequisites**
SWE 301 and completion of internship

**Hours of Lecture or Seminar per week**
1

**Hours of Lab or Studio per week**
0

**SWE 421 - Software Requirements and Design Modeling**

Credits: 3  
**Cross-Listed with CS 421**

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 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 modeling using UML notation. Students participate in a group project on software requirements, specification, and object-oriented software design.

**Prerequisites**
Grade C or better in CS 211.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

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**SWE 432 - Design and Implementation of Software for the Web**

Credits: 3
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.

**Prerequisites**
MATH 125 and CS 211.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

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**SWE 437 - Software Testing and Maintenance**

Credits: 3
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.

**Prerequisites**
CS 211 and MATH 125

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0
SWE 443 - Software Architectures

Credits: 3
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.

Prerequisites
SWE 421

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

SWE 510 - Object-Oriented Programming in Java

Credits: 3
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.

Prerequisites
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.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

SWE 619 - Object-Oriented Software Specification and Construction

Credits: 3
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.

Prerequisites
SWE foundation courses or equivalent.

Hours of Lecture or Seminar per week
SWE 620 - Software Requirements Analysis and Specification

Credits: 3
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.

Prerequisites
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

Credits: 3
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.

Prerequisites
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
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.

Prerequisites
SWE foundation courses or equivalent.
SWE 623 - Formal Methods and Models in Software Engineering

Credits: 3
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).

Prerequisites
SWE 619, or permission of instructor.

SWE 625 - Software Project Management

Credits: 3
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.

Prerequisites
SWE foundation courses or equivalent.

SWE 626 - Software Project Laboratory

Credits: 3
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.

Prerequisites
SWE 619, 620, and 621; or permission of instructor.
SWE 630 - Software Engineering Economics

Credits: 3
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.

Prerequisites
SWE 625

SWE 631 - Object-Oriented Design Patterns

Credits: 3
Cross-Listed with CS 631

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.

Prerequisites
SWE 619 or 621, or CS 540 or 571; or graduate course in object-oriented programming or equivalent.

SWE 632 - User Interface Design and Development

Credits: 3
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.

Prerequisites
SWE 619, or CS 540 and 571, or permission of instructor.
SWE 637 - Software Testing

Credits: 3
Concepts and techniques for testing software and ensuring its quality. Topics cover software testing at the unit, module, subsystem, and system levels; automatic and manual techniques for generating and validating test data; testing process; static versus dynamic analysis; functional testing; inspections; and reliability assessment.

Prerequisites
SWE 619, or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

SWE 641 - Systems Architecture for Large-Scale Systems

Credits: 3
Cross-Listed with SYST 621

See SYST 621.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

SWE 642 - Software Engineering for the World Wide Web

Credits: 3
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.

Prerequisites
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
SWE 645 - Component-Based Software Development

Credits: 3
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.

Prerequisites
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

SWE 699 - Special Topics in Software Engineering

Credits: 3
Special topics not occurring in regular SWE sequence.

Prerequisites
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

SWE 720 - Advanced Software Requirements

Credits: 3
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.

Prerequisites
SWE 620 and 621.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0
**SWE 721 - Reusable Software Architectures**

Credits: 3
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.

**Prerequisites**
SWE 621

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**SWE 723 - Precise Modeling**

Credits: 3
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.

**Prerequisites**
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
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.

**Prerequisites**
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  
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.

Prerequisites  
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  
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.

Prerequisites  
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  
Advanced topics not occurring in existing courses. Topics normally assume knowledge in one or more existing MS SWE courses.

Prerequisites  
12 credits applicable toward MS program.

Notes  
Repeatable within degree for credit when subject differs.

SWE 796 - Directed Readings in Software Engineering
Credits: 3
Analysis and investigation of contemporary problem in software engineering. Requires prior approval by faculty member who supervises student's work. Written report also required.

Prerequisites
Permission of instructor

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.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

SWE 798 - Research Project

Credits: 3
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.

Prerequisites
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.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

SWE 799 - Thesis

Credits: 6

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.

Prerequisites
Permission of advisor.

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**
0

**Hours of Lab or Studio per week**
0

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**SWE 825 - Special Topics in Web-Based Software**

Credits: 3  
**Cross-Listed with** IT 825

Advanced topics in specifying, designing, modeling, developing, deploying, testing, and maintaining software written as web applications and web services.

**Prerequisites**
SWE 642.

**Notes**
May be repeated with change in topic.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

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**SYST 101 - Understanding Systems Engineering**

Credits: 3
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**
3

**Hours of Lab or Studio per week**
0

**When Offered**
S

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**SYST 198 - Independent Study in Systems Engineering**
Credits: 1-3
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**
0

**Hours of Lab or Studio per week**
0

**When Offered**
F, S, SUM

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**SYST 210 - Systems Design**

Credits: 3
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**
3

**Hours of Lab or Studio per week**
0

**When Offered**
F

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**SYST 220 - Dynamical Systems I**

Credits: 3
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.

**Prerequisites**
MATH 114 and PHYS 160

**Corequisite**
MATH 214, MATH 203, and SYST 221.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**When Offered**
S
SYST 221 - Systems Modeling Laboratory

Credits: 1
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.

Corequisite
SYST 220.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
3
When Offered
S

SYST 320 - Dynamical Systems II

Credits: 3
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.

Prerequisites
SYST 220, MATH 203, 214; PHYS 260, 261.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0
When Offered
F

SYST 330 - Systems Methods

Credits: 3
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.

Prerequisites
MATH 114

Corequisite
STAT 346 and SYST 221.
**SYST 335 - Discrete Systems Modeling and Simulation**

Credits: 3  
**Cross-Listed with** OR 335

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.

**Prerequisites**  
CS 112 or grade of C or better in IT 103, and STAT 344 or STAT 346 or MATH 351 or grade of C or better in STAT 250.

**Corequisite**  
None.

**Hours of Lecture or Seminar per week**  
3  
**Hours of Lab or Studio per week**  
0  
**When Offered**  
S

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**SYST 371 - Systems Engineering Management**

Credits: 3  
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.

**Prerequisites**  
SYST 210

**Corequisite**  
SYST 330.

**Hours of Lecture or Seminar per week**  
3  
**Hours of Lab or Studio per week**  
0  
**When Offered**  
S
**SYST 420 - Network Analysis**

Credits: 3  
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.

**Prerequisites**  
OR 441 and MATH 213.

**Hours of Lecture or Seminar per week**  
3

**When Offered**  
F

**SYST 421 - Classical Systems and Control Theory**

Credits: 3  
**Cross-Listed with** ECE 421


**Prerequisites**  
Grade of C or better in ECE 220.

**Hours of Lecture or Seminar per week**  
3

**When Offered**  
F, S, SUM

**SYST 460 - Introduction to Air Traffic Control**

Credits: 3  
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.

**Prerequisites**  
Senior standing or graduate standing
SYST 461 - Air Transportation System Engineering

Credits: 3
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.

Prerequisites
SYST 460 or permission of instructor.

SYST 465 - Pricing in Optimization and Game Theory

Credits: 3
Cross-Listed with ECON 496/MATH 493

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.

Prerequisites
MATH 203 or 216, and OR 441, or permission of instructor.
SYST 469 - Human Computer Interaction

Credits: 3
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.

Prerequisites
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
F, S

SYST 470 - Human Factors Engineering

Credits: 3
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.

Prerequisites
SYST 210 and STAT 346

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

When Offered
F

SYST 473 - Decision and Risk Analysis

Credits: 3
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.

Prerequisites
STAT 344 or STAT 346 or MATH 351 or grade of C or better in STAT 250

Hours of Lecture or Seminar per week
SYST 480 - Economic Systems Design I: Principles and Experiments

Credits: 3
Cross-Listed with ECON 440

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.

Prerequisites
OR 441

Corequisite
SYST 465.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

SYST 481 - Economic Systems Design II: Case Studies and Analysis

Credits: 3
Cross-Listed with ECON 441

Students required to design and develop mechanism to a specific allocation problem. Analytical and working engineering models of mechanism must be developed.

Prerequisites
SYST 480.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

SYST 489 - Senior Seminar

Credits: 3

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.

**Corequisite**
SYST 490.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**When Offered**
F

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**SYST 490 - Senior Design Project I**

Credits: 3
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.

**Prerequisites**
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**
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**
F

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**SYST 491 - Industrial Project**

Credits: 1-3
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.

**Prerequisites**
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**
0
SYST 495 - Senior Design Project II

Credits: 3  
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.

Prerequisites  
Grade of C or better in SYST 490.

Corequisite  
SYST 330

SYST 498 - Independent Study in Systems Engineering

Credits: 1-3  
Directed self-study of special topics of current interest in systems engineering.

Prerequisites  
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.

Notes  
May be repeated for maximum 6 credits if topics are substantially different.

SYST 499 - Special Topics in Systems Engineering

Credits: 3  
Topics of special interest to undergraduates.

Prerequisites
60 credits toward BS in systems engineering; specific prerequisites vary with nature of topic.

**Notes**
May be repeated for maximum 6 credits if topics are substantially different.

**SYST 500 - Quantitative Foundations for Systems Engineering**

Credits: 3  
**Cross-Listed with** CSI 600

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.

**Prerequisites**
MATH 203, 213.

**Hours of Lecture or Seminar per week**
3  
**Hours of Lab or Studio per week**
0  
**When Offered**
F

**SYST 510 - Systems Definition and Cost Modeling**

Credits: 3  
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.

**Prerequisites**
Graduate standing.

**Hours of Lecture or Seminar per week**
3  
**Hours of Lab or Studio per week**
0  
**When Offered**
F, S
SYST 512 - Systems Engineering for Design and Development

Credits: 3

Prerequisites
SYST 510 or equivalent.

When Offered

SYST 513 - Total Systems Engineering, Reengineering and Enterprise Integration

Credits: 3
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.

Prerequisites
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
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.

Prerequisites
Graduate standing.

Hours of Lecture or Seminar per week
SYST 521 - Network Analysis

Credits: 3
Cross-Listed with OR 643


Prerequisites
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
F

SYST 530 - System Management and Evaluation

Credits: 3
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.

Prerequisites
Graduate standing.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

When Offered
F, S

SYST 540 - Analysis for Systems Management

Credits: 3
Cross-Listed with OR 540
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. OR/MS and SE/MS.

Prerequisites
MATH 108 and STAT 250 or DESC 210; or equivalent.

Notes
Majors do not receive credit.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

When Offered
F, S

SYST 542 - Decision Support Systems Engineering

Credits: 3
Cross-Listed with EEP 602

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.

Prerequisites
SYST 301 or graduate standing.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

When Offered
F

SYST 560 - Introduction to Air Traffic Control

Credits: 3
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.

Prerequisites
Graduate standing.
SYST 563 - Research Methods in Systems Engineering and Information Technology

Credits: 3
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.

Prerequisites
STAT 346 and 354, or equivalent.

SYST 571 - Systems Engineering Management

Credits: 3
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.

Prerequisites
SYST 471 or 530.

SYST 573 - Decision and Risk Analysis
Credits: 3
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.

Prerequisites
STAT 346 or equivalent.

Notes
Offered concurrently with SYST 473. Students may not receive credit for both SYST 473 and 573.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0
When Offered
F, S

**SYST 574 - Quality Control and Process Management**

Credits: 3
Cross-Listed with OR 574

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.

Prerequisites
Graduate standing or permission of instructor.

**SYST 576 - Manufacturing Systems Analysis**

Credits: 3
Cross-Listed with OR 576

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.

Prerequisites
Graduate standing or permission of instructor.

**SYST 611 - System Methodology and Modeling**
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.

Prerequisites
SYST 500 or equivalent.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0
When Offered
F, S

SYST 619 - Introduction to Architecture Based Systems Engineering.

Credits: 3
Cross-Listed with ECE 672


Prerequisites
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
Cross-Listed with ECE 673

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.

Prerequisites
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
Cross-Listed with ECE 674

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.

Prerequisites
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
Cross-Listed with ECE 675


Prerequisites
SYST 620/ECE 673 and SYST 621/ECE 674 or permission of instructor.

Corequisite
SYST 621/ECE 674.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

SYST 631 - Systems Engineering of Information Architectures

Credits: 3
Cross-Listed with ECE 678

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.

**Prerequisites**
SYST 520 and SYST 619/ECE 672.

**Notes**
This course does not meet the requirements for the MS/SE degree.

**SYST 632 - System Integration and Architecture Evaluation**

Credits: 3  
**Cross-Listed with** ECE 679


**Prerequisites**
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  
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.

**Prerequisites**
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**
SYST 660 - Air Transportation Systems Modeling

Credits: 3
Cross-Listed with OR 660

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.

Prerequisites
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
S

SYST 664 - Bayesian Inference and Decision Theory

Credits: 3
Cross-Listed with STAT 664

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.

Prerequisites
STAT 544 or 554, or equivalent.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

When Offered
S
SYST 671 - Judgment and Choice Processing and Decision Making

Credits: 3
Cross-Listed with OR 671

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.

Prerequisites
STAT 510 or equivalent, or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0
When Offered
F

SYST 674 - Dynamic Programming

Credits: 3
Cross-Listed with OR 674

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.

Prerequisites
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 677 - Statistical Process Control

Credits: 3
Cross-Listed with OR 677/STAT 677

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.
Prerequisites
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
Cross-Listed with ECE 670/OR 683

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.

Prerequisites
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
F

SYST 683 - Modeling, Simulation, and Gaming

Credits: 3
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.

Prerequisites
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

Credits: 3
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.

Prerequisites
SYST 680 or ECE 670.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

SYST 685 - Estimation and Tracking: Principles and Techniques

Credits: 3
Principles and estimation techniques for static and dynamic systems, linear and nonlinear, discrete and continuous time. Estimation for kinematic models, track initiation, bearing-only tracking, tracking maneuvering targets with adaptive filtering, MM (Multiple Model) and interactive MM algorithms. Tracking single target in clutter, nearest neighbor algorithm, tracking and data association, Multiple hypothesis tracking. Tracking performance evaluation.

Prerequisites
ECE 528, OR 542, STAT 544, or equivalent.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

SYST 691 - Introduction to Enterprise Engineering: Engineering and Policy

Credits: 4
Cross-Listed with PUBP 771

Provides overview of Extended Enterprise Integration. Lectures focus on the SAP architecture and the R/3 standard software solution. Laboratory requires students to complete an end-to-end implementation project with the Great Plains Software midrange ERP solution, Dynamics C/S +. For modeling, students must demonstrate complete proficiency in the Architecture of Information Systems (ARIS) methodology, and the supporting ARIS Toolset.

Prerequisites
INFS 614, or equivalent.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
1

SYST 692 - Decision Support for Enterprise Integration
Focuses on use of "business intelligence" to enhance competitive advantage; developing an information driven set of controls to improve profitability; and emphasizing the creation of a balanced business with aligned corporate direction and strategic intent. Solutions provided within ERP systems examined.

**Prerequisites**
SYST 542 and 691.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

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**SYST 693 - Supply Chain Integration and Management (Business-to-Business Electronic Commerce)**

Credits: 3
**Cross-Listed with** PUBP 773

Lectures focus on two issues: Supply chain integration from an information technology perspective, and supply chain management from a decision support perspective. The motivation for the course is the merging of enterprise computing with operations research, primarily through customer/supply chain management systems. Topics include ERP/web integration, advanced planning, and customer relationship management.

**Prerequisites**
SYST 691.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

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**SYST 694 - E-Commerce Architectures (Business-to-Consumer Electronic Commerce)**

Credits: 3
**Cross-Listed with** PUBP 774

Introduction to network and system architectures that support high-volume business to consumer web sites and portals. Course provides insight into the structure of the modern web enabled storefront. Critical business and technology issues include Storage Area Networks (SANs), server clustering, load balancing techniques at the server and network level, fault tolerance, and recovery of database and application servers.

**Prerequisites**
SYST 691.

**Hours of Lecture or Seminar per week**
3
SYST 695 - Economics of Electronic Commerce

Credits: 3
Cross-Listed with PUBP 775

Focuses on gaining competitive advantage through electronic commerce implementation; the identification and growing of new market opportunities, as well as the electronic enabling of existing business relationships; business-to-consumer relationships, as well as the economics of strategic procurement, ERP hosting, customer relationship management, catalog hosting, portal operations, and supplier management.

Prerequisites
SYST 691.

SYST 696 - Customer Relationship Management

Credits: 3
Cross-Listed with PUBP 776

Focuses on the "front office" and its integration with the "back office." The modern world of e-commerce extends intra-enterprise integration as implemented in Enterprise Resource Planning (ERP) systems to include external constituents, such as customers, partners, and suppliers. This course is focused on modern system support for the demand chain and the value creation process that results from integrating the front office systems with the back office systems.

Prerequisites
SYST 691.

SYST 697 - Critical Information Technology Infrastructures

Credits: 3
Cross-Listed with PUBP 777

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 versus routed data flow, workflow engines, business rule and web application servers, and load-balancing technologies. A large-scale web-enabled ERP system
architecture examined in detail.

**Prerequisites**
SYST 694.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

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**SYST 698 - Independent Study and Research**

Credits: 3
Study of a selected area in systems engineering or C3I under the supervision of a faculty member. Written report required.

**Prerequisites**
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**
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**SYST 735 - Topics in Stochastic System Simulation**

Credits: 3

**Cross-Listed with** OR 735

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 ariate generation, variance reduction techniques, sensitivity analysis and optimization of simulation models, distributed and parallel simulation, object-oriented simulation, and specialized applications.

**Prerequisites**
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 760 - Special Topics in Command, Control, Communications, Computing, and Intelligence Systems Engineering

Credits: 3
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.

Prerequisites
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
Cross-Listed with IT 763/OR 763

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.

Prerequisites
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
Cross-Listed with STAT 781

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.

Prerequisites
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
**SYST 798 - Systems Engineering Project**

Credits: 3
Capstone project course for MS/SE program. Key activity is completion of major applied team project resulting in an acceptable technical report, and oral briefing. Students should plan to take course in last semester of studies.

**Prerequisites**
21 graduate credits, including SYST 611.

**Hours of Lecture or Seminar per week**
0

**Hours of Lab or Studio per week**
0

**SYST 799 - Master's Thesis**

Credits: 1-6
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.

**Prerequisites**
21 graduate credits and permission of instructor.

**Hours of Lecture or Seminar per week**
0

**Hours of Lab or Studio per week**
0

**SYST 842 - Models of Probabilistic Reasoning**

Credits: 3
**Cross-Listed with** IT 842/OR 842

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.

**Prerequisites**
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 - Systems Integration Engineering

Credits: 3
Cross-Listed with IT 850

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

Prerequisites
SYST 510 or 520.

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
Cross-Listed with ECE 753/IT 888/OR 888

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.

Prerequisites
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
Cross-Listed with OR 944/ IT 944

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.
Prerequisites
SYST 842 or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

TAX 700 - Federal Income Taxation

Credits: 3
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.

Prerequisites
Prerequisite: Graduate degree status

Hours of Lecture or Seminar per week
3

TAX 701 - Accounting Methods and Periods

Credits: 1.5
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.

Prerequisites
Graduate degree status

Corequisite
TAX 700

Hours of Lecture or Seminar per week
1.5

TAX 702 - Tax Practice and Procedures

Credits: 1.5
Professional responsibilities and ethics, tax research, tax penalties, practice before the IRS, tax policy, and other issues.

Prerequisites
Graduate degree status

Corequisite
TAX 700
TAX 703 - Corporate Taxation

Credits: 3
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.

Prerequisites
Graduate degree status

Corequisite
TAX 700

TAX 704 - Corporate Mergers and Acquisitions

Credits: 1.5
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.

Prerequisites
TAX 703

TAX 705 - Affiliated Corporations

Credits: 1.5
Studies consolidated tax return regulations and filing requirements for affiliated corporations.

Prerequisites
TAX 703

TAX 706 - Partnership Taxation
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.

**Prerequisites**
Graduate degree status

**Corequisite**
TAX 700

**Hours of Lecture or Seminar per week**
3

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**TAX 710 - Federal Estate and Gift Taxation**

Credits: 3
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.

**Prerequisites**
TAX 700

**Hours of Lecture or Seminar per week**
3

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**TAX 711 - International Taxation**

Credits: 3
Taxation of individuals and corporations with foreign-source income and tax liability to the United States.

**Prerequisites**
TAX 700

**Hours of Lecture or Seminar per week**
3

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**TAX 712 - Seminar in Advanced Tax Policies**

Credits: 3
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.

**Prerequisites**
TAX 700
TAX 713 - State and Local Taxation

Credits: 3
Detailed analysis of the principal forms of state and local taxation.

Prerequisites
TAX 700

TAX 714 - Pensions and Deferred Compensation

Credits: 3
Analysis of the structure, operation, and requirements for obtaining and maintaining IRS approval of tax-qualified pensions, profit sharing, and deferred compensation plans.

Prerequisites
TAX 700

TAX 792 - Management of Professional Service Organizations

Credits: 3
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.

Prerequisites
Admission to the MS Tax program or permission of the director. Completion of 18 hours of MSA or MST required coursework.

TCOM 500 - Modern Telecommunications

Credits: 3
Cross-Listed with ECE 540

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.

Prerequisites
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
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.

Prerequisites
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
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 clientserver model; domain name systems; and telnet.

Prerequisites
Graduate standing

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
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 wavelength division multiplexed and Time-Division Multiplexed networks and optical switching systems.

Prerequisites
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
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.

Prerequisites
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
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.

Prerequisites
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)
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.

Prerequisites
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
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)

Prerequisites
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
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.

Prerequisites
TCOM 500

Hours of Lecture or Seminar per week
1.5

Hours of Lab or Studio per week
0

TCOM 513 - Optical Communications Networks
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.

Prerequisites
TCOM 503

TCOM 514 - Basic Switching: Lecture and Laboratory Course

Credits: 3
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.

Prerequisites
TCOM 501 and 502

TCOM 515 - Internet Protocol Routing: Lecture and Laboratory Course

Credits: 3
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.

Prerequisites
TCOM 501, 502, and 509

TCOM 516 - Global Positioning System (GPS)
Credits: 1.5
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.

Prerequisites
TCOM 500

Hours of Lecture or Seminar per week
1.5

Hours of Lab or Studio per week
0

TCOM 517 - Introduction to Propagation Effects

Credits: 1.5
Introduction to radiowave propagation effects in wireless communications systems. Propagation effects on terrestrial point-to-point (line of sight), satellite (fixed service, mobile, and direct broadcast), and cellular services are evaluated. Clear air, multipath (atmospheric and terrestrial), diffraction, refraction, tropospheric and ionospheric scintillation, rain attenuation, ice crystal and rain depolarization, and low angle fading effects are covered. Impact of climate and path geometries on fade margin assessed, and mechanisms for reducing potentially adverse effect of propagation conditions discussed.

Prerequisites
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
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.

Prerequisites
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
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.

Prerequisites
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
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.

Prerequisites
Graduate standing; TCOM 500

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
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.

Prerequisites
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
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.

Prerequisites
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
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.)

Prerequisites
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
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).

Prerequisites
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
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.

Prerequisites
TCOM 500

Hours of Lecture or Seminar per week
1.5

Hours of Lab or Studio per week
0

TCOM 541 - Network Design and Pricing

Credits: 1.5
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.

Prerequisites
TCOM 500

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

Prerequisites
TCOM 500.

Hours of Lecture or Seminar per week
1.5
TCOM 545 - Reliability and Maintainability of Networks

Credits: 3
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.

Prerequisites
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
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.

Prerequisites
TCOM 500.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

TCOM 547 - Project Management in Telecommunications

Credits: 3
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.

Prerequisites
Graduate standing.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**TCOM 548 - Security and Privacy Issues in Telecommunications**

Credits: 1.5
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.

**Prerequisites**
Graduate standing.

**Hours of Lecture or Seminar per week**
1.5

**Hours of Lab or Studio per week**
0

**TCOM 551 - Digital Communication Systems**

Credits: 3
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.

**Prerequisites**
TCOM 500.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**TCOM 552 - Introduction to Mobile Communications Systems**

Credits: 3
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.

**Prerequisites**
TCOM 500 and 551.

**Hours of Lecture or Seminar per week**  
3

**Hours of Lab or Studio per week**  
0

TCOM 553 - Carrier Telecommunications

Credits: 1.5  
Sampled signals; delta modulation; adaptive delta modulation; pulse amplitude modulation; pulse code modulation. Sampling theorem; quantization; quantization noise; aliasing; time division multiplexing; North America/Japan T carriers; European Ecarriers. Introduction to digital communications: data codes; baseband line codes; noise and its effects; modulation and demodulation methods. Amplitude shift keying; frequency shift keying; phase shift keying; differential phase shift keying; multilevel signaling; hybrid signaling; comparative performance.

**Prerequisites**  
TCOM 500

**Hours of Lecture or Seminar per week**  
1.5

**Hours of Lab or Studio per week**  
0

TCOM 555 - Network Management Foundations and Applications

Credits: 3  
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.

**Prerequisites**  
TCOM 500, 501, and 502.

**Hours of Lecture or Seminar per week**  
3

**Hours of Lab or Studio per week**  
0

TCOM 556 - Applied Cryptography

Credits: 1.5  
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.

**Prerequisites**
TCOM 500 and 548.

**Hours of Lecture or Seminar per week**
1.5

**Hours of Lab or Studio per week**
0

**TCOM 562 - Network Security Fundamentals**

Credits: 3
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.

**Prerequisites**
TCOM 500.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**TCOM 575 - Quantitative Foundations for Telecommunications**

Credits: 3
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.

**Prerequisites**
Graduate standing

**Notes**
Course cannot be used for credit in any IT&E graduate degree program.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0
**TCOM 590 - Selected Topics in Telecommunications**

Credits: 1.5, 3.0  
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.

**Prerequisites**  
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, 3.0  
**Hours of Lab or Studio per week**  
0

**TCOM 591 - Selected Topics in Telecommunications**

Credits: 1.5, 3.0  
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.

**Prerequisites**  
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, 3.0  
**Hours of Lab or Studio per week**  
0

**TCOM 598 - Independent Study in Telecommunications**

Credits: 1.5, 3.0  
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.

**Prerequisites**  
Graduate standing; approval of 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.
TCOM 599 - Independent Study in Telecommunications

Credits: 1.5, 3.0
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.

Prerequisites
Graduate standing; approval of 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.

TCOM 603 - Standards for Advanced Optical Networks

Credits: 3
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.

Prerequisites
TCOM 503 and 513

TCOM 606 - Advanced Mobile Communications Systems

Credits: 3
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.

**Prerequisites**
TCOM 552

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**TCOM 607 - Satellite Communications**

Credits: 3
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.

**Prerequisites**
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
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.

**Prerequisites**
TCOM 509 and 515, or equivalent.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**TCOM 610 - Border Gateway Protocol (BGP) Routing**
Credits: 3
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.

Prerequisites
TCOM 509 and 515, or equivalent.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

TCOM 611 - Multi-Protocol Label Switching (MPLS)

Credits: 3
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.

Prerequisites
TCOM 609 or 610

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

TCOM 660 - Network Forensics

Credits: 3
Cross-Listed with CFRS 660

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.

Prerequisites
TCOM 509, and working knowledge of computer programming.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

TCOM 661 - Digital Media Forensics
The document contains course descriptions for TCOM 662 - Advanced Secure Networking, TCOM 663 - Operations of Intrusion Detection and Forensics, and their respective prerequisites and lecture hours.

**TCOM 662 - Advanced Secure Networking**

Credits: 3
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.

**Prerequisites**
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
Cross-Listed with CFRS 663
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.

**Prerequisites**
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

Cross-Listed with CFRS 664

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.

Prerequisites
TCOM 509 and TCOM 529.

When Offered

TCOM 690 - Advanced Topics in Telecommunications

Credits: 3
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.

Prerequisites
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
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.

Prerequisites
Permission of instructor; specific prerequisites vary.

Hours of Lecture or Seminar per week
3
TCOM 696 - Independent Reading and Research

Credits: 1.5, 3.0
Study of selected area in specialty modules 1, 2, or 3 under supervision of faculty member. Written report required.

Prerequisites
Graduate standing; approval of program director.

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 697 - Independent Reading and Research

Credits: 1.5, 3.0
Studies selected area in specialty modules 4 or 5 under supervision of faculty member. Written report required.

Prerequisites
Graduate standing; approval of program director.

Notes
No more than total 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
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.

Prerequisites
Graduate standing.
TCOM 699 - Telecommunications Project Course

Credits: 3
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, classtime discussion of current trends, difficulties, and new opportunities for the industry. Projects presented to department faculty at end of semester.

Prerequisites
Graduate standing

TCOM 707 - Advanced Link Design

Credits: 3
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.

Prerequisites
TCOM 551.

TCOM 750 - Coordinating Seminar

Credits: 3
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.
**TECM 610 - Communications and Leadership**

Credits: 2  
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.

**Prerequisites**  
Admission to Technology Management Program.

**Hours of Lecture or Seminar per week**  
3

**Hours of Lab or Studio per week**  
0

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**TECM 615 - Decision Making Using Accounting and Financial Data**

Credits: 3  
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.

**Prerequisites**  
Admission to Technology Management Program.

**Hours of Lecture or Seminar per week**  
3

**Hours of Lab or Studio per week**  
0

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**TECM 620 - Economics of Technology Management**

Credits: 2  
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.

**Prerequisites**
Admission to Technology Management Program.

**Hours of Lecture or Seminar per week**
2

**Hours of Lab or Studio per week**
0

**TECM 635 - Metrics and Statistics for Quality and Project Management**

Credits: 2
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.

**Prerequisites**
Admission to Technology Management Program.

**Hours of Lecture or Seminar per week**
2

**Hours of Lab or Studio per week**
0

**TECM 640 - Management of Consulting and Technical Professionals**

Credits: 3
Students gain insight into conflict resolution, teamwork, communication, power and influence, career development, and ethics. This course also helps students understand themselves and those they manage, as they work to be as effective as possible in modern organizations.

**Prerequisites**
Admission to Technology Management Program.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**TECM 660 - Negotiation, Conflict Resolution, and Group Decision Making**

Credits: 2
Techniques for making group decisions and resolving internal team conflicts, as well as negotiating effectively with outside parties. Applications include technology assessments, outsourcing decisions, project bidding, and contract negotiations.

**Prerequisites**
Admission to Technology Management Program.

**Hours of Lecture or Seminar per week**
2
**TECM 700 - Business Engineering and Change Management**

Credits: 2
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.

**Prerequisites**
Admission to Technology Management Program.

**Hours of Lecture or Seminar per week**
2

**Hours of Lab or Studio per week**
0

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**TECM 702 - Interpersonal Dynamics and Teamwork**

Credits: 3
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.

**Prerequisites**
Admission to Technology Management Program.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

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**TECM 703 - Technology Assessment, Evaluation, and Investment**

Credits: 3
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.

**Prerequisites**
Admission to Technology Management Program.

**Hours of Lecture or Seminar per week**
3
TECM 704 - Planning and Control of Projects

Credits: 3
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.

Prerequisites
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
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.

Prerequisites
Admission to Technology Management Program.

Hours of Lecture or Seminar per week
2

Hours of Lab or Studio per week
0

TECM 735 - Technology Management Capstone Project

Credits: 2
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.

Prerequisites
Admission to Technology Management Program.
TECM 740 - Management of Client Relationships

Credits: 3
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.

Prerequisites
Admission to Technology Management Program.

Hours of Lecture or Seminar per week
2
Hours of Lab or Studio per week
0
Grading
Special graduate.

TECM 745 - Business Functions and Operations: Client Industries

Credits: 3
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.

Prerequisites
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: 3
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.

Prerequisites
Admission to Technology Management Program.
**TELE 694 - Telecommunications Internship**

Credits: 3-6
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.

**Prerequisites**
Graduate standing, and permission of MA in telecommunications program director.

**TELE 730 - Telecommunications Management**

Credits: 3
Surveys strategic and organizational issues in field of telecommunications management. Focuses on strategic management; oriented toward executive management level of telecommunications firms.

**Prerequisites**
Graduate standing.

**TELE 750 - Coordinating Seminar**

Credits: 3
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.

**Prerequisites**
Open only to students in MA or MS in telecommunications programs with at least 18 credits of course work.
**TELE 798 - Directed Readings and Research**

Credits: 3
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.

**Prerequisites**
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
Individualized section form required. Original research related to student's concentration in telecommunications. Research must result in document meeting university standards.

**Prerequisites**
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**
0

**Hours of Lab or Studio per week**
0

**Grading**
S/NC

**THR 101 - Theatrical Medium**

Credits: 3
Introduces medium of theatrical performance and its role in contemporary society, and investigates components of production from conception through performance to ensuing criticism. Lectures, demonstrations by theater professionals. Students required to attend theatrical performances on- and off-campus, and submit a written report on each.

**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
Covers development of Western drama and theater from its beginnings through Shakespeare. Considers readings in dramatic literature and history of theater in social context.

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
Covers development of Western drama and theater post-Shakespeare to present day. Considers readings in dramatic literature and history of theater in social context.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

THR 190 - Special Topics

Credits: 1-3
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 196 - Performance and Design Practicum

Credits: 1
Academic credit awarded for satisfactory completion of assignment on departmental productions. Examples include acting; design of sets, lights, costumes, or sound; and stage management.

Notes
Minimum 30 hours participation.

Hours of Lecture or Seminar per week
0
THR 197 - Management/Literary Practicum

Credits: 1
Academic credit awarded for satisfactory completion of a variety of assignments in the development and presentation of a live theatrical event. Examples include director, playwright, dramaturg, technical director, master electrician, and publicist.

Notes
Minimum 30 hours of participation.

Hours of Lecture or Seminar per week
0
Grading
S/NC

THR 198 - Theatrical Construction Practicum

Credits: 1
Academic credit awarded for satisfactory completion of a theatrical construction assignment on departmental production. Examples include scenery construction, scene painting, electrician, and costume construction.

Notes
Minimum 30 hours of participation.

Hours of Lecture or Seminar per week
0
Grading
S/NC

THR 199 - Production Run Crew Practicum

Credits: 1
Academic credit awarded for satisfactory completion of run crew assignment on departmental production. Examples of assignments include stage crew, light board operator, sound board operator, wardrobe, and fly crew.

Notes
Minimum of 30 hours of participation required.
THR 200 - Play Production Practicum

Credits: 1
Academic credit is awarded for satisfactory participation in departmental (GMU Players) or Theater of the First Amendment productions.

Notes
May be repeated for total 4 credits.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
0
Grading
S/NC

THR 201 - Stage Management

Credits: 1
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

Credits: 1
Principles of literary management and dramaturgy for regional/resident theater. Directed primarily toward developing new work.

Hours of Lecture or Seminar per week
1
Hours of Lab or Studio per week
0

THR 203 - Production/Company Management

Credits: 1
Techniques of production and company management applied to university and professional theater productions.

Hours of Lecture or Seminar per week
1
THR 210 - Acting I

Credits: 3
Reviews and analyzes the history and development of acting theory from various cultural contexts; introduces contemporary acting techniques through individual and group exercises, incorporating tools such as observation, sense and emotion memory, and improvisation, thus expanding the student's awareness of human behavior, thought, and language. Students develop appreciation of theater and its basic elements through attendance of live performances on- or off-campus, in-class critical evaluation, and oral and written reflection.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

THR 230 - Introduction to Technical Theater

Credits: 3
Reviews and analyzes theory, practice, and historical context of physical production component of theater; studies current trends in technical theater, and explains how they developed from earlier technology; collaborative work demonstrating the responsibilities of group problem solving to complete tasks; and provides a foundation for the appreciation of the theatrical medium whether as a member of the production or audience.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

THR 235 - Fundamentals of Costume Construction

Credits: 3
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.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

THR 300 - Voice and Speech Fundamentals
Basic techniques in breathing, vocal production, and articulation for the actor.

**Prerequisites**
THR 210 or permission of instructor.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

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**THR 301 - Voice and Speech for the Performer**

Credits: 3
Integration of text and performance problems with voice and speech fundamentals begun in THR 300. Advanced work in vocal production and character-specific sounds.

**Prerequisites**
THR 300 or permission of instructor.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

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**THR 303 - Movement for the Actor I**

Credits: 3
Develops physical side of actor's instrument emphasizing free and responsive expression of impulse and intention.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

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**THR 304 - Movement for the Actor II**

Credits: 3
Advanced work in techniques established in THR 303.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0
THR 305 - Stage Combat

Credits: 3
Studies safe, effective techniques for performing unarmed stage fights, falls, and rolls. Emphasizes acting the fight, safety, and storytelling.

Prerequisites
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
Extends principles begun in THR 210 through scene study, audition technique, and work in analysis, characterization, and relationships.

Prerequisites
THR 210 or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

THR 314 - Lighting Stagecraft

Credits: 3
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.

Prerequisites
THR 230 or permission of instructor

Corequisite
Must be concurrently enrolled in THR 200

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

THR 315 - Sound Engineering
Credits: 3
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.

**Prerequisites**
THR 230 or permission of instructor

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

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**THR 320 - Beginning Modern Acting**

Credits: 3
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.

**Prerequisites**
THR 210 and 310, or permission of instructor.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

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**THR 321 - Acting Shakespeare**

Credits: 3
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.

**Prerequisites**
THR 210 and 310, or permission of instructor.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

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**THR 329 - Directing I**

Credits: 3
Introduces text analysis, rehearsal procedure, staging techniques, and development of production idea. Students direct exercises and short scenes, and prepare written production notes.
Prerequisites
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
Offered periodically; addresses selected topic in design or technical theater on advanced level.

Prerequisites
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
Studies conventions and techniques of drafting and model making as methods of communication in the theatrical production process.

Prerequisites
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
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.

**THR 333 - Stage Design**

Credits: 3  
Fundamentals of creating, developing, and communicating design idea through sketches, plans, rendering, or models. Analysis of text from designer's perspective.

**Prerequisites**  
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  
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.

**Prerequisites**  
THR 230 or permission of instructor.

**Hours of Lecture or Seminar per week**  
3

**Hours of Lab or Studio per week**  
0

**THR 335 - Costume Design**

Credits: 3  
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.

**Prerequisites**  
THR 230 or permission of instructor.

**Hours of Lecture or Seminar per week**  
3
THR 336 - Advanced Theater Technology

Credits: 3
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.

Prerequisites
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
Project-oriented class explores theory and practice of sound design including history, technology, script analysis, and auditory aesthetics.

Prerequisites
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
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.

Prerequisites
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
With techniques developed in THR 329, students analyze and stage extended scenes or one-act plays. Emphasizes collaborative process and production organization.

Prerequisites
THR 329 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
Project-oriented class emphasizing makeup for different performance spaces, character age analysis, facial anatomy, and specialized application for theater, opera, dance, film, and television.

Prerequisites
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
Pattern development through draping and drafting. Laboratory study and practical experience in construction of stage costumes.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

THR 345 - Puppetry: History and Technique

Credits: 4
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
THR 350 - Script Analysis

Credits: 3
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.

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
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.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

THR 352 - Dramatic Literature Seminar

Credits: 3
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.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

THR 355 - Moral Vision in American Theater
Credits: 3
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.

Prerequisites
THR 101, theater major, or permission of instructor.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

THR 359 - World Stages

Credits: 3
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.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

THR 365 - Characterization

Credits: 3
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.

Prerequisites
THR 210.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

THR 380 - Playwriting I
Credits: 3
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
3
Hours of Lab or Studio per week
0

THR 381 - Playwriting II

Credits: 3
Intensive continuation of work begun in THR 380.

Prerequisites
THR 380 or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

THR 382 - Screenplay Workshop

Credits: 3
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
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.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

THR 420 - Advanced Modern Acting
Credits: 3
Advanced scene study to build on skills from previous acting courses. Students assigned actor's approach, midterm sonnet presentation, and final scene.

**Prerequisites**
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 421 - One-Person Show

Credits: 3
Students work with designated faculty in creative writing, staging, and performance culminating in the successful writing, rehearsing, and performing of a one-person show.

**Prerequisites**
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
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.

**Prerequisites**
THR 310 or equivalent, or permission of instructor.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

### THR 424 - Contemporary Women Playwrights

Credits: 3
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.

**Prerequisites**
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  
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.

**Prerequisites**  
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  
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.

**Prerequisites**  
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  
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.

**Prerequisites**  
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.

Notes
Meets university general education synthesis requirement.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

THR 480 - Advanced Playwriting

Credits: 3
Advanced playwriting workshop in which students explore their own voice in theatrical writing.

Prerequisites
THR 381, or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

THR 482 - Advanced Screenplay Workshop

Credits: 3
Screenwriting workshop emphasizing student development in screenplay form, structure, and storytelling with emphasis on craft, character, and story culminating in a screenplay.

Prerequisites
THR 382 or permission of the instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

THR 484 - Translation & Adaptation for Stage & Screen

Credits: 3
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.

Prerequisites
Junior standing
THR 490 - Special Topics in Drama

Credits: 1-6
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.

THR 491 - Major's Seminar on the Profession

Credits: 3
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.

Prerequisites
Junior theater major.

THR 494 - Field Experience

Credits: 1-6
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.

Notes
May be repeated for a total of 12 credits.
Grading
S/NC

THR 495 - Senior Capstone Project

Credits: 3
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.

Prerequisites
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
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.

Prerequisites
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
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.

Prerequisites
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
0
Hours of Lab or Studio per week
0

THR 571 - Advanced Playwriting Workshop

Credits: 3
Advanced playwriting workshop in which students explore their own voice in theatrical writing.

Prerequisites
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
Independent reading, performance, or research on a specific project under direction of selected faculty member. May include attendance in a parallel undergraduate course.

Prerequisites
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

TOUR 190 - Wedding Planning

Credits: 3
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.
 TOUR 200 - Introduction to Travel and Tourism

Credits: 3
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.

 TOUR 210 - Global Understanding through Travel and Tourism

Credits: 3
Approved general education requirement. 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.

Notes
Open to nonmajors.

 TOUR 220 - Introduction to Event Management

Credits: 3
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.
TOUR 221 - Event Implementation and Evaluation

Credits: 3
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.

Prerequisites
TOUR 220

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

TOUR 230 - Introduction to Hospitality Management

Credits: 3
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
Provides practical experience in the travel and tourism environment through selective fieldwork, job placement, and seminar or conference attendance.

Prerequisites
TOUR 200 and TOUR 220

Notes
TEM majors only

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
3
Grading
PASS/FAIL

TOUR 311 - Women and Tourism
Credits: 3
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.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

TOUR 312 - Ecotourism

Credits: 3
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.

Prerequisites
TOUR 200

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

TOUR 330 - Resort Management

Credits: 3
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.

Prerequisites
TOUR 200 and TOUR 220

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

TOUR 340 - Sustainable Tourism

Credits: 3
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.
Prerequisites
TOUR 200 and TOUR 220

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

TOUR 352 - Heritage and Cultural Tourism

Credits: 3
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.

Prerequisites
TOUR 200 and TOUR 220

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

TOUR 362 - Cultural and Environmental Interpretation

Credits: 3
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.

Prerequisites
PRLS 300, or PRLS 328, or TOUR 352

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

TOUR 412 - Tourism and Events Marketing

Credits: 3
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.
Prerequisites
TOUR 200, TOUR 220, PRLS 310, and PRLS 410

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

TOUR 414 - Tourism and Events Finance

Credits: 3
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.

Prerequisites
TOUR 200, TOUR 220, PRLS 310, and PRLS 410

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

TOUR 420 - Tourism Planning/Policy

Credits: 3
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.

Prerequisites
PRLS 310 and TOUR 340

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

TOUR 430 - Tourism on Public Lands

Credits: 3
Evolution, status, and management of tourism on federal, state, and municipal lands, including USDA Forest Service, Bureau of Land Management, National Park Service, and state forest jurisdictions. Emphasizes supply and demand, multiple-use issues, policy and management, funding, tourism impacts, jurisdictional coordination, and the role of adjacent private lands.

Prerequisites
PRLS 310 and TOUR 340
TOUR 440 - Meetings and Conventions

Credits: 3
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.

Prerequisites
TOUR 200 and PRLS 310

TOUR 470 - Senior Seminar

Credits: 1
Capstone educational experience focuses on current issues in tourism and event management, and career development strategies.

Prerequisites
TOUR 241, HEAL 323, TOUR 340, TOUR 440, and PRLS 410

Notes
Only for TOUR majors with senior status.

TOUR 480 - Special Topics

Credits: 1-3
Selected topics reflect interest in specialized area of tourism and events management. Announced in advance.

Prerequisites
60 credits
TOUR 490 - Internship

Credits: 12
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.

Prerequisites
Open to majors only. 90 credits, TOUR 241, HEAL 323, TOUR 340, TOUR 440, and PRLS 410

Notes
Open only to majors.

TOUR 499 - Independent Study

Credits: 1-3
Faculty directed independent study of approved topics in tourism and events management.

Prerequisites
TOUR 200 and 220, and 90 credits

Notes
TOUR majors only.

TOUR 540 - Sustainable Tourism Management

Credits: 3
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.
UNIV 100 - University: Freshman Transition

Credits: 1-2
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.

Hours of Lecture or Seminar per week
1-2

Hours of Lab or Studio per week
0

UNIV 101 - Freshman Academic Transition

Credits: 1:2:0
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.

UNIV 190 - Freshman Seminar

Credits: 3
Broad interdisciplinary subjects taught by Robinson Professors; topics vary.

Prerequisites
Freshman standing; enrollment is by minimum 3.30 cumulative high school GPA and invitation.

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 200 - University: Sophomore Transition

Credits: 2
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.

**Hours of Lecture or Seminar per week**
2

**Hours of Lab or Studio per week**
0

**UNIV 300 - University: Junior Transition**

Credits: 1
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 301 - Great Ideas in Science**

Credits: 3
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.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**UNIV 342 - The George Mason Debates in Current Affairs**

Credits: 3
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.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**UNIV 400 - University: Senior Transition**
Credits: 1
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.

Hours of Lecture or Seminar per week
1
Hours of Lab or Studio per week
0

UNIV 442 - Krasnow Seminar

Credits: 3
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.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

USST 301 - Urban Growth in a Shrinking World

Credits: 3
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.

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
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
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.

Prerequisites
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

Credits: 3
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.

Prerequisites
Open only to students with 12 credits of USST; see USST coordinator

Hours of Lecture or Seminar per week
0

Hours of Lab or Studio per week
0

WMST 100 - Representations of Women

Credits: 3
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.

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
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.

**Prerequisites**
30 credits.

**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: 3
Study of selected topics central to contemporary women's studies. Topics vary but include subjects such as women and violence, women and international development, women's myth and ritual, the history and politics of sexuality, psychoanalysis, and religion.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**WMST 301 - Sex and Gender in Contemporary Society**

Credits: 3
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.

**Prerequisites**
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
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.

**Prerequisites**
6 credits of 200-level English courses.

**Hours of Lecture or Seminar per week**
WMST 303 - Psychology of Women

Credits: 3
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.

Prerequisites
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
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.

Prerequisites
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
An exploration of the experience of women as both authors of and subjects in imaginative literature.

Prerequisites
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
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.

Prerequisites
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
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.

Prerequisites
30 credits.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

WMST 308 - Queer Studies

Credits: 3
Introduction to a broad range of "queer" issues, beginning with a critical examination of the categories used to describe sexuality. Explores major events in LGBTQ 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.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0
WMST 330 - Feminist Theory Across the Disciplines

Credits: 3
Examination of feminist critique and transformation of the theories, methods, and methodologies of the sciences and humanities.

Prerequisites
WMST 200, or permission of instructor.

Hours of Lecture or Seminar per week
3
Hours of Lab or Studio per week
0

WMST 400 - Internship in Women and Gender Studies

Credits: 1-3
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.

Prerequisites
Completion of 60 credits, including WMST 200, or permission of instructor.

Notes
May be repeated for credit, up to 6 credits.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
0

WMST 401 - Experiential Learning in Women and Gender Studies

Credits: 1-3
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.

Prerequisites
Concurrent enrollment in women's studies course.

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's studies interdisciplinary minor.

Hours of Lecture or Seminar per week
0
Hours of Lab or Studio per week
0
WMST 410 - Feminist Approaches to Social Research

Credits: 3
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.

Prerequisites
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
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.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

WMST 427 - Feminist Political Thought

Credits: 3
Explores feminist political thought in historical context. Topics include feminist political movements, feminist critiques of political philosophy, and feminist contributions to political theory.

Prerequisites
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

WMST 490 - Independent Study in Women and Gender Studies
Credits: 1-3
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.

Prerequisites
9 WMST credits including WMST 200, or permission of instructor.

Notes
May be repeated for credit up to a total of 6 credits.

Hours of Lecture or Seminar per week
0

Hours of Lab or Studio per week
0

WMST 600 - Special Topics

Credits: 3
Study of selected topics central to contemporary women's 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.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
0

WMST 610 - Feminist Approaches to Social Research

Credits: 3
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.

Prerequisites
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

WMST 611 - Gender Research Project

Credits: 3
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.

**Prerequisites**
WMST 610 or SOCI 634.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**WMST 630 - Feminist Theories across the Disciplines**

Credits: 3
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

**WMST 640 - Women and Global Issues**

Credits: 3
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.

**Prerequisites**
Graduate standing.

**Hours of Lecture or Seminar per week**
3

**Hours of Lab or Studio per week**
0

**WMST 690 - Directed Readings and Research in Women and Gender Studies**

Credits: 3
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.

**Prerequisites**
Graduate standing and permission of instructor.
Notes
May be repeated for total 9 credits.

Hours of Lecture or Seminar per week
3

Hours of Lab or Studio per week
3-6

WMST 699 - Capstone Portfolio

Credits: 0
Prior to graduation and in consultation with their advisor, students will reflect on and synthesize their work in the women's 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.

Prerequisites
Students must have completed their course work for women's 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