Equal Opportunity/Affirmative Action

George Mason University is an Equal Opportunity/Affirmative Action institution committed to the principle that access to study or employment opportunities afforded by the University, including all benefits and privileges, be accorded to each person—student, faculty, or staff member—on the basis of individual merit and without regard to race, color, religion, national origin, sex, age, or handicaps (except where sex or age is a bona fide occupational qualification).

Students, employees, or applicants for admission or employment who believe that they have not been dealt with by this University in accordance with the principles and requirements stated above may address the Office of Affirmative Action, George Mason University, stating the facts that occasioned the complaint, presenting any relevant documents or correspondence, and requesting assistance in resolution of the matter. Disabled students or applicants may also contact the Advisor to Disabled Students.

The Catalog

Detailed in this catalog are the programs and degrees offered by the Graduate School. All information, including statements of tuition and fees and admission and graduation requirements, is subject to change without notice.

For further information regarding any of the programs listed in this catalog or for applications, please write or call the Office of Admissions, 117 Finley Building, George Mason University, 4400 University Drive, Fairfax, VA 22030-4444, phone (703) 323-2100.
George Mason University

Contents

Academic Calendar 1988-1989 .......... 2
Fall Semester 1988, 2
Spring Semester 1989, 3
Summer Session, 4

Profile of George Mason University .... 6

The Graduate School .................. 10
Graduate Programs, 11
Educational Centers, 13

Graduate Policies and Procedures .... 18
Admission, 18
Registration, 21
Honor System and Code, 29

Tuition, Expenses, and Financial Aid .. 34
Tuition and Fees, 34
Financial Aid, 36

Student Life ........................... 40
Student Support Services, 40
Student Activities, 42

Areas of Study .......................... 45
Accounting, 45
Biology, 47
Business Administration, 53
Chemistry, 60
Computer and Electronics Engineering, 62
Computer Science, 67
Conflict Management, 71
Economics, 73
Education: Curriculum and Instruction, 78
Education: Doctor of Arts in Education, 93
Education: Educational Leadership and Human Development, 95
English, 100
Foreign Languages and Literatures, 107
Geographic and Cartographic Sciences, 111
Health Education, 113
History, 115
Information Systems and Systems Engineering, 119
Information Technology, 124
Interdisciplinary Studies, 131
Mathematics, 133
Music, 137
Nursing, 140
Operations Research and Applied Statistics, 145
Physical Education, 149
Physics, 151
Psychology, 153
Public Administration, 162
Sociology, 169

Certificates, Programs, and Additional Graduate Courses .......... 174
Certificates, 174
Northern Virginia Cooperative Graduate Engineering Program, 176
Additional Graduate Courses, 177

General Policies ....................... 183

Campus Map, Telephone Directory, and Index ............... 186
Campus Map, 186
Telephone Directory, 187
Index, 189

http://catalog.gmu.edu
Academic Calendar 1988–1989
Academic Calendar 1988–1989

Fall Semester 1988

March 1
Last day for filing D.N.Sc. admissions applications for fall 1988.

April 1
Last day for filing Graduate School fellowship applications for doctoral students.

April 1
Last day for filing Ph.D. Economics, Ph.D. Biology, and D.P.A. admissions applications for fall 1988.

May 1
Last day for filing master’s and Ph.D. Information Technology admissions applications for fall 1988.

May 1
Last day for filing Graduate School fellowship applications for master’s students.

July 4
Independence Day observed; University closed.

July 18
Start counseling and registration for fall extended studies enrollees. Call for appointment on or after July 5.

July 15
Last day for mail-in, hand-in registration for fall. Registration in person continues by priority groups.

July 15
Master’s theses and doctoral dissertations due in Office of the Graduate Dean for August graduation.

August 4
Tuition and fees due for early registered students (payment with late fee will be accepted until August 11).

August 5
Fall registrations canceled for early registered students who have not made arrangements for payment with cashier (canceled students who do not reregister for fall are assessed a $20 administrative fee).

August 19–27
Registration and adjustment. (For times and priorities see Schedule of Classes.)

August 29
First day of classes.

September 5
Labor Day; University closed.

September 6
Last day for a full tuition refund (less $20 fee).

September 7
Second deferred tuition payment due.

September 8–28
Pick up winter master’s and doctoral degree and certificate applications at the Office of the Registrar. (Application must be completed and returned with fee no later than September 28.

September 13
Last day for schedule adjustment for fall classes.

September 15
Last day for a partial tuition refund—second week.

September 20
Last day for partial tuition refund—third and final week.

October 1
Last day for filing Ph.D. Economics admissions applications for spring 1989.

October 5
Third deferred tuition payment due.

October 11–13
Recess (Note: Monday classes and laboratories meet on Wednesday this week only).

October 12
Monday classes and laboratories meet on Wednesday at Monday scheduled times and places; Wednesday scheduled classes and laboratories do not meet this week.

October 25
Spring Semester Schedule of Classes (registration calendar) published. Mail-in/hand-in registration commences for designated categories of students the day after schedules are distributed. For times and priorities, see Schedule of Classes.

November 1
Last day for filing master’s, Ph.D. Biology, Ph.D. Information Technology, and D.P.A. admissions applications for spring 1989.

November 1
Last day for filing financial aid applications for spring 1989.

November 15
Master’s theses and doctoral dissertations due in Office of the Graduate Dean for January graduation.

November 14
Start counseling for spring extended studies enrollees. Call for appointment on or after November 1.
November 24-27
Thanksgiving recess; University closed.

December 9
Last day for mail-in/hand-in registration for spring 1989. Registration in person continues by priority groups.

December 10
Last day of classes.

December 19
Tuition and fees due for early registered students. Payment with late fee will be accepted by mail if received by January 5 (but University offices will be closed December 24-January 2).

December 12-19
Examinations (for times, see Schedule of Classes).

December 15
Early registration ends.

Spring Semester 1989

January 6
Spring registrations canceled for early registered students who have not made arrangements for payment with cashier (canceled students who do not reregister for spring are assessed a $20 administrative fee).

January 11-19
Registration and schedule adjustment (for times and priorities see Schedule of Classes).

January 23
First day of classes.

January 30
Last day for a full tuition refund (less $20 fee).

February 1
Last day for filing D.A.Ed. admissions applications for fall 1989.

February 6
Last day for partial tuition refund—second week.

February 6
Last day for schedule adjustment for spring classes.

February 8-28
Pick up spring master’s and doctoral degree and certificate applications at Office of the Registrar. (Applications must be completed and returned with fee no later than February 28.)

February 13
Last day for a partial tuition refund—third and final week.

February 15
Second deferred tuition payment due.

February 15
Last day for filing Psy.D. admissions applications for fall 1989.

March 1
Last day for filing master’s admissions applications for summer session and D.N.Sc. admissions applications for fall 1989.

March 8-April 28
Pick up summer master’s and doctoral degree applications at the Office of the Registrar. (Applications must be completed and returned with fee no later than April 28.)

March 12-19
Midsemester recess.
April 1
Last day for filing D.P.A., Ph.D. Biology, Ph.D. Economics admissions applications for fall 1989.

April 1
Last day for filing Graduate School fellowship applications for doctoral students.

April 1
Last day for filing the Financial Aid Form (FAF) for summer and fall 1989.

May 1
Last day for filing master's and Ph.D. Information Technology admissions applications for fall 1989.

May 1
Last day for filing Graduate School fellowship applications for master's students.

May 6
Last day of classes.

May 8–15
Examinations (for times and snow day make-up, see Schedule of Classes).

May 20
Spring commencement.

May 29
Memorial Day observed; University closed.

May 30
Summer session begins.

---

Summer Session

Summer session consists of several terms, ranging in length from five to eight weeks, during the period May 30 through August 5. Classes are offered during both day and evening hours. For details, consult the summer session catalog, which is available in early March.
Profile of George Mason University
Profile of George Mason University

George Mason University is a dynamic, forward-looking institution that provides a diverse and interactive curriculum to educate students for life in a rapidly changing, highly technical world. George Mason, a medium-sized state university, is in Northern Virginia, convenient to all the resources of the nation’s capital and the greater Washington, D.C., metropolitan area.

Both George Mason and its surrounding Fairfax County have experienced phenomenal development over the past several years. From its origins in 1957 as a two-year branch of the University of Virginia, George Mason has grown into a comprehensive institution offering degrees through the doctoral level. From a rural suburb of Washington, D.C., Fairfax County has developed into a center of high technology enterprise, promising to rival the West Coast’s Silicon Valley and the Boston area’s Route 128 corridor.

The University’s leadership has carefully planned curricular emphases to make the best use of the area’s resources in high technology, the arts and humanities, and public affairs. George Mason’s programs are an integral part of its Northern Virginia locale, giving to and receiving from the community in both service and intellectual interchange. The University also participates fully in the national and international exchange of ideas and knowledge.

The University’s growing stature and reputation are exemplified by the presence of Virginia’s first Nobel laureate, economist James Buchanan. The George Mason professor won the 1986 Nobel Prize in economics for his public choice theory of political decision making. Buchanan is executive director of the University’s Center for Study of Public Choice, which applies scientific economic methods to the “public choice behavior” of voters, party leaders and other politicians, lobbyists, and bureaucrats.

This center and 36 other GMU centers and institutes enhance University scholarship and contribute, both directly and indirectly, to the intellectual growth of the George Mason student.

Location

Situated on 583 wooded acres near the city of Fairfax, the University’s Main Campus combines the quiet of a suburban setting with accessibility to Washington’s libraries, galleries, and museums; Virginia’s historic sites; and Fairfax County’s high technology firms. A modern subway is convenient to the campus, taking riders to the U.S. Capitol in 35 minutes. It also provides a quick ride to GMU’s 10-acre Metro Campus in Arlington, Virginia, which houses the law school and a professional and conference center. The subway and major highways also connect with suburban centers in Virginia and nearby Maryland.

Programs

The University’s main academic divisions are the College of Arts and Sciences, College of Education and Human Services, School of Business Administration, School of Information Technology and Engineering, School of Nursing, Graduate School, School of Law, and School of Continuing and Alternative Learning. GMU offers a total of 96 degree programs, including 56 undergraduate, 32 master’s, 7 doctoral, and a juris doctor degree.

Academic departments provide innovative and distinctive programs. For example, the University’s Plan for Alternative General Education (PAGE), an integrated interdisciplinary program, received the 1986 Theodore Miltan Award for Innovation and Change in Higher Education from the American Association of State Colleges and Universities. The George Mason English Department, with several noted writers on its faculty, is establishing a national reputation. Its seminars and workshops attract many internationally known authors as workshop leaders and seminar speakers.

Students

The majority of the University’s more than 18,000 students are from Virginia, with the other 49 states and 81 foreign countries well 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, 25 and up, are growing in numbers. George Mason welcomes qualified students with a wide range of interests and backgrounds. Its diverse student body is a microcosm of modern society.

Faculty

Included among the University’s 519 full-time instructional faculty members are experts in a broad variety of fields who have published widely, contributed to major research findings, and consulted with government and business. Besides a Nobel laureate, the faculty numbers winners of awards from the Guggenheim Foundation and the National Endowments for the Arts and for the Humanities, as well as winners of Fulbright Awards and Mellon Fellowships; and the University-endowed Robinson professors, eminent scholars dedicated to interdisciplinary education and undergraduate education, whose presence enhances graduate education as well.

http://catalog.gmu.edu
Campus Facilities

George Mason has matched its rapid development with a carefully planned building program. Its 29 academic facilities include modern classroom buildings and state-of-the-art scientific laboratories and computer centers supporting student class work and faculty research.

A new Science and Technology Building recently opened on the Main Campus, and the first phase of a new Arts Center will be completed during the 1988-89 year. A 2,000-seat concert hall planned for the Arts Center will augment the existing Harris Theatre, expanding the range of performing arts presentations on campus.

The opening in 1985 of the Patriot Center, a 10,000-seat sports and entertainment arena, provided a spacious new home for George Mason’s major campus and varsity athletic activities and benefitted the larger Northern Virginia community. The center is designed for basketball, indoor soccer, concerts, and other sports and entertainment events as well as large convocations such as the annual commencement ceremonies.

Also recently opened, the University’s multipurpose Sports and Recreation Complex features 64,000 square feet of space indoors, including a 200-meter track; multiple baseball, tennis, handball/racquetball, and volleyball courts; a baseball and softball diamond and batting cage; a weight room; saunas; and golf and archery nets. Outdoor features include a 400-meter track, a baseball diamond, and soccer and other playing fields.

The University’s 18 dormitory buildings house more than 1,700 students. A variety of dining facilities, meeting rooms, a bank, the campus bookstore, and other student services are available in George Mason’s two student unions.

Computing Services

The University has several mainframe computers including Digital VAX 8500 and 8530 systems, providing large-scale, contemporary software environments. Several hundred microcomputers (primarily IBM PC and AT compatibles) and terminals are available for student use in general purpose computer laboratories around campus, in the library, in dormitories, and in other key locations. Additional computing facilities, used for special applications such as artificial intelligence, computer graphics, elementary and secondary teacher education, library searching, and English composition, are also available. Access to computing throughout the campus is available through MASONet, a broadband and ethernet local area communications network. All academic buildings are linked to the central Computer Center through MasoNet, and a student with the capability at home can dial-in to the network.

Libraries and Special Collections

The George Mason University libraries consist of Fenwick Library, the central collection on the Main Campus in Fairfax, and the Law Library at the Metro Campus in Arlington. Fenwick Library contains approximately 300,000 book volumes, 450,000 microforms, and 3,800 serials; an additional 20,000 volumes are added annually. The Law Library holds more than 200,000 book volumes and subscribes to more than 700 legal and law-related journals. Fenwick Library is open approximately 100 hours per week during the fall and spring semesters. The Law Library is open approximately 85 hours per week during the regular academic year.

Graduate students at George Mason University have access to library facilities on both campuses. Library borrowing privileges are extended to those holding a valid GMU library borrower’s card. Graduate students are eligible to borrow materials directly from member institutions of the Northern Virginia Consortium and the Consortium of Universities of the Washington Metropolitan Area. They may also use interlibrary loan services to obtain library resources.

Fenwick Library is a leader in the field of applying computerized automation to library functions and services. At the center of this effort is an automated library information system that provides computerized circulation, public catalog, and in-house processing services. In addition, the library provides microcomputer-based access to more than 300 data bases of interest to researchers in all fields. A complement to this service is the library’s active role in helping students and faculty access this information—both through training and by providing a laboratory of microcomputer workstations.

Fenwick Library has been a selective depository for U.S. government documents since 1969. Additional government publications and other specialized collections are available in the microforms collection of the library (for example, ERIC, Human Relations Area File, Library of English Literature, Library of American Civilization). Items not available at the University may be borrowed through the library’s computerized interlibrary loan service. Special services for the handicapped include a TTY for hearing-impaired persons and a Kurzweil Reading Machine for the visually impaired.

Fenwick Library offers students a wide range of audiovisual services, including small-group viewing facilities for video cassettes, laser discs, 16 mm films, slides, and filmstrips, and listening facilities for audiocassettes and records. The audiovisual resource center has a growing collection of media in most formats and is staffed during all regular library hours. Audiovisual equipment may be borrowed for use on campus from distribution sites in both Robinson and Thompson Halls.

The Washington metropolitan area offers some of the premier library and information resources in the nation. Including the Library of Congress, the National Archives, the Smithsonian Institution, the Folger Shakespeare Library, Dumbarton Oaks, the National Library of Medicine, the National Agricultural Library, and the World Bank. There are also numerous university libraries and special collections. Fenwick Library is a member of the Consortium of Universities of the Washington Metropolitan Area, providing direct borrowing privileges at the other participating universities for faculty and degree-program graduate students. Fenwick Library also participates in a data base sharing program with the Fairfax County Public Library System and the MITRE Corporation.

http://catalog.gmu.edu
The University Library also houses special collections and archives containing primary resource materials to be used by scholars in their research. More than 50 collections include these source materials for research:

The Federal Theatre Project Collection. Placed on permanent loan from the Library of Congress, this contains the major playscripts, radioscritps, sets, costume designs and other creative materials produced by the Federal Theatre of the 1930s.

Northern Virginiana. This includes the papers of Congressman William Scott: historical collections from C. Harrison Mann, including rare historical maps, atlases, geographies, and law books relating to Virginia; and other papers of public officials.

Performing Arts Archives. Papers from the American Symphony Orchestra League and the Wolf Trap Foundation for the Performing Arts.

Photographic Collections. Prints and negatives, including those of Ollie Atkins, correspondent and photographer for the Saturday Evening Post and official White House Photographer from 1965 to 1974.

Rare Books. Includes first editions and rare historical materials.

For further information about Fenwick Library, call 323-2616 or the main reference desk at 323-2392.

Metro Campus Professional Center and Conference Center

The Metro Campus Professional and Conference Center is in Arlington on the third floor of the Metro Campus, 3401 North Fairfax Drive, adjacent to the Virginia Square-GMU Metro Station (Orange Line).

Graduate courses for five master's degree programs are regularly scheduled in the Professional Center: accounting, business administration, economics: public policy track, human resources program, and information resource management. A master's degree in economics: public policy track may be completed entirely at the Metro Campus. Several liberal arts undergraduate courses are also offered at the Professional Center. Most courses are taught in convenient weekly sessions beginning at 4:30 p.m., 6:00 p.m., and 7:20 p.m. Courses are also offered on Saturdays from 9:00 a.m. to noon. More than 4,000 credit and noncredit students are served by the Professional Center.

The 200-seat Conference Center and Metro Gallery serve an additional 30,000 persons annually, who participate in University and community programs and business and professional conferences. The Metro Gallery hosts 12 professional art shows annually and is the site of many community cultural events.

The GMU Information Center on the Kirkwood Drive side of the building provides University publications and information on programs and activities at the Metro Campus and the Main Campus. Catalogs and applications are available. The Information Center telephone number is (703) 841-2604. Hours are from 9:00 a.m. to 9:00 p.m. weekdays.

School of Law

The School of Law is at the Metro Campus in Arlington, 15 minutes from downtown Washington via the orange Metrorail line. The school offers programs leading to the first professional degree in law, the juris doctor. Full-time faculty members teach most courses in both the day and evening divisions. The school is fully accredited by the American Bar Association.

The curriculum provides the basic knowledge and skills necessary for practice in any state. Many courses are problem oriented or involve extensive writing. The faculty includes perhaps the largest concentration of law and economics scholars in the United States.

The School of Law is phasing in an innovative series of specialty tracks, allowing students to develop in-depth knowledge of an area of practice beginning with the onset of legal education. The specialty in patents begins in fall 1988, and track programs in corporate and securities law and in banking and financial services begin in fall 1989. A track in real estate finance is also planned.

For further information, please see the law catalog or write or call George Mason University School of Law, Admissions Office, 3401 N. Fairfax Drive, Arlington, VA 22201-4498; (703) 841-2640.

George Mason University Press

Under the guidance and administration of the Graduate School, the George Mason University Press was established in April 1983 to provide a scholarly publishing dimension in the overall mission of the University to create and disseminate knowledge through teaching, research, and publication. Administered by a director under the supervision of a faculty editorial board, the GMU Press welcomes manuscripts in all areas of scholarship and seeks to publish monographs, books, research reports, conference proceedings, symposia, or reference works developed by local faculty and by authors throughout the world of scholarly endeavor. Among its publications, the Press issues the annual series of lectures presented on The Legacy of George Mason. GMU Press books are advertised, exhibited, promoted, and sold worldwide by its exclusive agent, University Publishing Associates.

Visiting the Campuses

Visitors are always welcome at the University, and prospective students are especially encouraged to visit the campuses, preferably while the University is in session. Administrative offices are open Monday through Friday, but because hours vary, appointments are suggested.

Parking regulations are enforced 24 hours a day, seven days a week. Permits or decals are required for parking on campus Monday through Friday from 7:00 a.m. to 10:00 p.m. Decals are not required on weekends. Special parking places are provided for disabled persons. Parking permits and assistance in parking are available at both campuses through the University Parking Services Office.

Accreditation

George Mason University is fully accredited by the Southern Association of Colleges and Schools.
The Graduate School
Graduate study was initiated at George Mason in 1970 with the goal of providing opportunities for students to participate in intensive and individualized programs of study under the direction of a strong faculty. To promote this goal, the Graduate School encourages research, inquiry, and scholarship at the highest levels from both students and faculty.

The Graduate School offers 32 master's programs, 7 doctoral programs, and 6 certificate programs. Nearly all graduate courses are offered in the late afternoon and early evening. In fall 1987 more than 4,000 admitted graduate students were enrolled at George Mason, and more than 1,400 postbaccalaureate students were taking courses through extended studies enrollment.

Organization
The Graduate Faculty, operating under bylaws adopted in 1975, is the governing body for all academic policies and procedures of the Graduate School. The Graduate Faculty approves all new graduate programs; authorizes all graduate coursework, policies, and degrees conferred by the University; and sets standards for admission to and graduation from the graduate programs.

The Graduate Council is the executive and policymaking body of the Graduate Faculty. It consists of one graduate faculty member elected from each department offering graduate work, three at-large members elected from the Graduate Faculty, and the Graduate School Dean. It meets approximately once a month to conduct business for the Graduate Faculty.

The Graduate Council has three standing committees: the Academic Policies and Procedures Committee, the Curriculum Committee, and the Graduate Student Affairs Committee.

Administration
Charles K. Rowley, Dean
James W. Fonseca, Associate Dean
Amelia A. Rutledge, Acting Associate Dean

Graduate Council Members 1987-88
John Allen James Maddux
Walter Bearn Anthony Maiello
Barry K. Beyer Bruce B. Manchester
Allan Boneau James A. Metcalf
Thomasina S. Borkman Eugene Norris
Phillip G. Buchanan James D. Palmer
Jeffrey T. Chamberlain James P. Pfiffner
Catherine E. Connelly Robert L. Pugh
E. Clark Dobson, Jr. Charles K. Rowley
James W. Fonseca Dean
Michael Ferri Richard Rubenstein
Wayne Froman James Sanford
John T. Gupton Jay Shaffer
Mary Hammond Jay Shapiro
Ronald Jensen William Shughart
Deborah Kaplan Mark Spikell
Kenneth A. Kovach Harry Stephanou
Vickie Lambert Edward J. Wegman
B. Joseph Lieb Nittaya Wongtada

Purpose of Graduate Study
Graduate education is not simply an extension of undergraduate education. Graduate education means advanced, intensive, and purposeful study. Accordingly, for graduate education to be valid and creditable, the graduate experience should demand that students inquire searchingly and apply themselves fully in their scholarly activities.

Graduate course work should be at a level that directly reflects and builds upon the knowledge and intellectual maturity a student acquires during the undergraduate years. The graduate experience should be of such duration that there is time for reflection, absorption, and the emergence of intellectual independence and scholarly self-confidence.

Students should have close and frequent contact with experienced scholar-teachers, and teaching resources and educational environments should be sufficient to promote advanced learning and meet graduate-level educational objectives. Provisions should exist within the Graduate School for regular evaluation of student performance to an extent that both students and their graduate teachers can be secure in the worth of their intellectual accomplishments.

Graduate study at the University involves a commitment to understanding and activity unlike that ordinarily called for in undergraduate degree programs. Graduate students, both full and part time, are expected to meet requirements and standards of study that regularly exceed those expected in undergraduate courses or programs. With the graduate faculty members determining standards for learning, graduate students are asked to join them in seeking excellence in advanced study.
Graduate Programs

Graduate School requirements applicable to all degrees are given in the first sections of the catalog. Specific graduate degree programs and their requirements are discussed in detail in the Areas of Study section, where they are listed in alphabetical order.

A number of departments without graduate degree programs offer graduate-level courses for elective credit and for personal or professional enrichment.

Glossary of Course Symbols
Computer names of courses offered by the University:

- Accounting: ACCT
- American Studies: AMST
- Anthropology: ANTH
- Arabic: ARAB
- Art History: ARTH
- Art Studio: ARTS
- Asian Studies: ASST
- Astronomy: ASTR
- Bachelor of Arts and Sciences Integrated Curriculum (BA/SIC): BASC
- Bachelor of Individualized Study: BIS
- Biology: BIOL
- Business Legal Studies: BULE
- Canadian Studies: CA
- Cartography: GEO
- Chemistry: CHEM
- Chinese: CHIN
- Classics: CLAS
- Communication: COMM
- Comparative Literature: CL
- Computer Science: CS
- Dance: DANC
- Decision Sciences: DESC
- Economics: ECON
- Education: EDUC
- Education: Administration/Supervision: EDAS
- Education: Elementary/Secondary: EDIC
- Education: Guidance/Counseling: EDGC
- Education: Reading: EDRD
- Education: Special Education: EDSE
- Electrical and Computer Engineering: ECE
- Engineering: ENGR
- English: ENGL
- European Studies: EUST
- Finance: FNAN
- Foreign Language: FRLN
- French: FREN
- Geographic and Cartographic Sciences: GECA
- Geography: GEOG
- Geology: GEOL

Course Numbering
1. Courses numbered 500 and above are graduate courses.
2. Courses are occasionally renumbered by departments. Additional credit may not be received for a course under a different number if all requirements have been completed and a satisfactory letter grade has been earned in the course under its original number. Graduate students are required to determine before registration that they have not completed a subject in a prior semester under a different number. For one year after the change the new number is accompanied by the old number in parentheses. Thus, 791 (591) means that the old course number was 591, and the new course number is 791. Students also may check with the department offering the course work to be certain that they are not repeating a graduate course for which they already have credit.
3. General numbers for graduate courses: 500-599
Graduate courses open only to graduate students (admitted to master's or doctoral programs), to
other bachelor's degree holders, and to 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 for the completion of an undergraduate degree; and with the written permission of the Graduate School, they may take these courses for reserve graduate credit.

600-699 Graduate courses open only to graduate students (admitted to master's or doctoral programs) and to other bachelor's degree holders.

700-799 Master's level graduate courses open only to graduate students (admitted to master's or doctoral programs). These numbers are used only for master's level course work.

800-899 Doctoral level graduate courses open only to graduate students admitted to study in doctoral programs. These numbers are used for doctoral level (post-master's) course work.

4. Special numbers for graduate courses (courses with these numbers are reserved for the uses designated):

600-609 Limited applicability graduate credit courses. Courses intended for in-service professional development and not directly leading to a graduate degree. From courses with these numbers a limited number of hours may be applied to a graduate degree.

798 Master's project research. A course under the supervision of a graduate faculty member resulting in the final professional project to be submitted in partial fulfillment of the requirements for the professional master's degree.

799 Master's thesis research. A course for research under the supervision of a graduate faculty member resulting in a master's thesis to be submitted in partial fulfillment of the requirements for the master's degree.

800 Studies for the Doctor of Arts in Education program.

998 Doctoral project research. A course under the supervision of a graduate faculty member resulting in the final professional project to be submitted in partial fulfillment of the requirement for the professional doctoral degree.

999 Doctoral dissertation research. A course for research under the supervision of a graduate faculty member resulting in a doctoral dissertation to be submitted in partial fulfillment of the requirements for the doctoral degree.

790, 890 Supervised practicum.

794, 894 Internship.

796, 896 Directed reading and research courses for master's and doctoral level students.

Programs of Study

Graduate and Professional Degrees, and Department or School Offering Degree

Accounting M.S. (Department of Accounting)
Applied and Engineering Physics M.S. (Department of Physics)
Biology M.S. (Department of Biology)
Business Administration M.B.A. (School of Business Administration)
Chemistry, M.S. (Department of Chemistry)
Computer and Electronics Engineering M.S. (Department of Electrical and Computer Engineering)
Computer Science M.S. (Department of Computer Science)
Conflict Management M.S. (Center for Conflict Analysis and Resolution)
Counseling and Development M.Ed. (Department of Educational Leadership and Human Development)
Creative Writing M.F.A. (Department of English)
Economics M.A., Ph.D. (Department of Economics)
Education D.A.Ed. (College of Education and Human Services)
Education Administration and Supervision M.Ed. (Department of Educational Leadership and Human Development)
Elementary Education M.Ed. (Department of Curriculum and Instruction)
English M.A. (Department of English)
Environmental Biology and Public Policy Ph.D. (Department of Biology)
Foreign Languages M.A. (Department of Foreign Languages and Literatures)
Geographic and Cartographic Sciences M.S. (Department of Public Affairs)
Health Education M.Ed. (Department of Health, Education, and Leisure Studies)
History M.A. (Department of History)
Information Systems M.S. (Department of Information Systems and Systems Engineering)
Information Technology Ph.D. (School of Information Technology and Engineering)
Interdisciplinary Studies M.A.I.S. (Individualized Study Degree Programs)
Law J.D. (School of Law)
Mathematics M.S. (Department of Mathematical Sciences)
Music M.A. (Department of Performing Arts)
Nursing M.S.N., D.N.Sc. (School of Nursing)
Operations Research and Management Science M.S. (Department of Operations Research and Applied Statistics)
Physical Education M.S. (Department of Health, Sport, and Leisure Studies)
Psychology M.A., Psy.D. (Department of Psychology)
Public Administration M.P.A., D.P.A. (Department of Public Affairs)
Reading M.Ed. (Department of Curriculum and Instruction)
Secondary Education M.Ed. (Department of Curriculum and Instruction)
Sociology M.A. (Department of Sociology and Anthropology)
Special Education M.Ed. (Department of Curriculum and Instruction)
Systems Engineering M.S. (Department of Information Systems and Systems Engineering)

Certificate Programs

Gerontology
Information Management and Expert Systems
International Nursing
Nursing Administration
Nursing Education
Teaching of English as a Second Language

http://catalog.gmu.edu
American Society of Cybernetics/ The Cybernetics Center
ASC members include social scientists, cyberneticians, mathematicians, computer specialists, and others professionally involved in cybernetics—the analysis of the flow of information in electronic, mechanical, and biological systems. Located in the Decision Sciences Department, the Cybernetics Center is committed to introducing integrative studies in the field by applying cybernetics to practical problems of business, system design, and public policy. The Cybernetics Center also publishes the journal *Cybernetics*.

Center for the Beginning Teacher Assistance Program (BTAP)
The Northern Virginia Regional Center for the Beginning Teacher Assistance Program (BTAP) is located in the Department of Curriculum and Instruction at George Mason University. Funded by the State of Virginia, the role of BTAP is twofold: (1) to assess beginning teachers in the classrooms to ensure that they possess certain minimum competencies; and (2) to provide assistance to those teachers in meeting these competencies. Successful completion of BTAP is required for a teacher to receive a five-year renewable Collegiate Professional Certificate.

Center for Behavioral and Cognitive Studies
The Center for Behavioral and Cognitive Studies, housed in the Psychology Department, carries out research, teaching, and service activities in areas related to developing human resources and enhancing human performance. Basic and applied research are sponsored by a variety of governmental agencies, state, and local governments, business and industry, private foundations, and associations. Initial areas are concentrating on research in selecting and training personnel in organizations, methods of measuring performance in complex systems, methods for improving human-computer interaction, factors in effective leadership and management, improving human reliability in complex systems, research on information processing and decision making, and developing and evaluating health-related motivational and educational programs. The center sponsors conferences that feature individuals of national stature to focus on the applications of behavioral sciences to pressing national and social issues.

Center for Bilingual/Multicultural Teacher Preparation
Supported by George Mason’s Department of Curriculum and Instruction, in collaboration with the English and Foreign Languages and Literatures departments, the center helps meet the needs of Northern Virginia school districts by training bilingual/ESL (English as a Second Language) educators fluent in English and Spanish, Korean, or Vietnamese. Once trained, these teachers aid the cultural adjustment of “language minority” school children with limited English proficiency, with the goal of mainstreaming them into the general student population as quickly as possible.

Center for Conflict Resolution
Affiliated with the Sociology and Anthropology Department, the Center for Conflict Resolution has three objectives: to continue to offer a master of science degree program in conflict management that trains professional conflict intervenors for mediating disputes at all levels of society, interpersonal to international; to demonstrate the potential of conflict management by developing community, state, national, and international programs; and to establish a resource base of knowledge, research, institutions, and individuals adept at specific problem solving.

Center for Economic and Social Education
One of five centers affiliated with the Virginia Council on Economic Education, the Center for Economic and Social Education dispenses information about economics and other social studies to elementary and secondary school teachers and administrations. The center maintains a lending library and provides educators with consultations, research reports, and in-service courses and programs.

Center for Government, Society, and the Arts
Encouraging research and academic programs that explore the reciprocal relations, past and present, between government, society, and the arts, this center acts as a clearinghouse of information on current programs and studies, and fosters scholarly, artistic, and educational projects. A primary resource is the Institute on the Federal Theatre Project (FTP) and New Deal Culture (see listing).

Center for Health Promotion
Working with area citizens, health professionals, and health-related organizations, the center offers technical advice and assistance on health issues and disease prevention in Northern Virginia. As a regional center for health promotion and education, it also sponsors health and fitness programs for community residents of all ages. The center is affiliated with the Health, Sport, and Leisure Studies Department.
Center for Interactive Educational Technology
The Center for Interactive Educational Technology, administered by the College of Education and Human Services, features a blend of the old and the new in instructional resources. The center has a microcomputer laboratory and will soon add a center for the study of videodiscs and robotics. Students are able to evaluate current instructional software or develop their own for particular subjects or classes. An audiovisual production laboratory is available to those interested in more traditional approaches, as well as a K-12 curriculum center that houses both print and nonprint materials.

Center for Interactive Management
The Center for Interactive Management stresses the application of technology to organizational management, with an emphasis on the solution of complex management problems. The top priority is to provide a management service that assists clients in resolving problems that have failed to yield to conventional approaches. In addition, the center conducts research aimed at new and advanced forms of computer-assisted participative management, and integrates field experience into classes, seminars, and training courses.

Center for Middle East Studies
Through its 42-hour undergraduate degree program in Middle East Studies, the center promotes a comprehensive examination of the art, culture, history, religions, and politics of this region and prepares students as Middle East specialists for careers in teaching, with the foreign service, and with international charitable and educational institutions. Throughout the year, the center generates research on the Middle East and sponsors conferences and lectures featuring authorities in the field. It is affiliated with the Public Affairs Department.

Center for Productive Use of Technology
Formerly the Center for Improvement of Productivity, the Center for the Productive Use of Technology promotes a more effective use of information resources by conducting research and providing consultative support in such areas as technology transfer, technical information networking, and knowledge diffusion and utilization. It is located at the Metro Campus.

Center for Real Estate and Land Use Analysis
Affiliated with the Finance Department in the School of Business Administration, the Center for Real Estate and Land Use Analysis supports the SBA's real estate and urban development program. Self-supporting, it promotes faculty research, sponsors seminars, and funds student research and class projects.

Center for Robotics and Control
Affiliated with the Institute for Information Technology, the center promotes research in robotics and control, focusing on efforts which are largely analytical or algorithmic.

Center for the Study of Constitutional Rights
The Center for the Study of Constitutional Rights examines the formation of the Bill of Rights and the ways that landmark document was influenced by George Mason of Gunston Hall. Established in 1981 as the Project for the Study of Human Rights, the center coordinates an annual lecture series, "The Legacy of George Mason," and publishes these lectures through the George Mason University Press. Past lectures have focused on the histories of states and countries that have established bills of rights, the effects of the First Amendment, and natural law and natural rights. The center is sponsored by Gunston Hall, the Fairfax Bar Association, the George Mason School of Law, the School of Continuing and Alternative Learning, the Virginia Foundation for the Humanities and Public Policy, the Alexandria Bicentennial Center, the Northern Virginia Association of Historians, and the departments of History, Public Affairs, American Studies, and Philosophy and Religious Studies.

Center for the Study of Market Processes
Market process economists strongly emphasize "spontaneous order," the unplanned social order created through voluntary exchange. Based on the theories of the Austrian School of economic thought, the center trains students for careers in academia, government, policy institutions, and business and industry. In addition to publishing a scholarly newsletter, Market Processes, the center's members conduct research on such topics as free banking, antitrust laws, socialist economic policies, and the economics of law. It is affiliated with George Mason's Economics Department.

Center for Study of Public Choice
Based on the "public choice" economic theory developed by executive director James Buchanan and former economics professor Gordon Tullock, the center applies scientific economic methods to the "public choice behavior" of voters, party leaders, lobbyists, politicians, and bureaucrats. It also encourages education and research programs in public choice theory, publishes research results, and, where relevant, formulates proposals for basic institutional-constitutional reforms based on such research. The center is affiliated with the Economics Department.

Character Recognition Center
The Character Recognition Center focuses on the conversion of hand-printed information directly to digital computer input. Such a capability, in a hand-held, moderate-cost instrument, has potential applications in businesses that now hand-letter forms and records for later computer analysis.

Citizens Applied Research Institute
To stimulate regional interest in research, the Citizens Applied Research Institute works with Northern Virginia government, industry, and civic organizations on projects of mutual interest to or at the request of those organizations. The institute is affiliated with the Department of Public Affairs.
Educational Study Center
A community outreach program, the Educational Study Center offers tutoring and career counseling to children and young adults in Northern Virginia, while training graduate students enrolled in the counseling and development, reading, and special education programs.

English Language Institute
Unique in Northern Virginia, the English Language Institute aids foreign-born members of the community by providing weekly, noncredit instruction in grammar, reading, culture, history, composition, and communication. The institute is administered by the Office of International Programs and Services.

Entrepreneurship Center
The Entrepreneurship Center comprises a Small Business Development Center, a financial database for venture capitalists and entrepreneurs, and space and support for new small businesses until they become independently viable and can afford to move to other quarters.

George Mason Institute of Science and Technology
Directed by 45 board members representing the University and Northern Virginia high-tech industry, the George Mason Institute (GMI) supports student internships, the executive/faculty exchange program, and endowed professorships and research fellowships in engineering and information technology. With donations of more than $1 million in funds and equipment, GMI has helped produce a statewide faculty resource data bank and helped develop high-technology curricula and research projects here at George Mason.

George Mason University Faculty Writing Project (FWP)
A branch of the NVWP, the George Mason University Faculty Writing Project works with University teachers from many disciplines to improve writing instruction for students across the curriculum. A five-week summer institute trains these faculty members as teacher/consultants who conduct workshops for colleagues. The FWP also publishes a newsletter of successful teaching practices for all George Mason faculty.

History Research Center
The History Research Center is a consolidation of several established projects supporting the historical interests of the University and Northern Virginia. These projects include directing the Northern Virginia Association of Historians (NVAH), a regional agency with approximately 400 members and 40 organizational affiliations, and producing its monthly newsletter, The Courier of Historical Events. Affiliated with George Mason's History Department, the center also produces a journal of local history, Northern Virginia Heritage, which has more than 1,000 subscribers, and has helped to establish the George Mason Project for the Study of Human Rights. In recent years, the center has broadened the scope of its project on local oral history and expanded its collection of books and manuscripts on Northern Virginia history and culture.

Indochina Institute
Established as an outreach program to the Indochinese community of the metropolitan area, the Indochina Institute encourages research on Indochina and its refugees; serves as a clearinghouse for information and research; organizes and sponsors conferences, lectures, and workshops; and sponsors the publication of research papers. It is affiliated with the Public Affairs Department.

Institute for Cross-Cultural Understanding
Promoting an understanding between people of different ethnic and cultural backgrounds is the focus of the Institute for Cross-Cultural Understanding. Affiliated with the Sociology and Anthropology Department, the institute promotes research, scholarly inquiry, and publications. It also conducts educational activities, supports cross-cultural studies, and encourages the practical application of research findings.

Institute for Humane Studies
The Institute for Humane Studies, located at Tallwood House at the northeast corner of campus, is a 25-year-old independent, nonprofit organization dedicated to advancing interdisciplinary scholarship in the humane sciences: ethics, history, economics, psychology, sociology, and moral, legal, and political philosophy. The institute's goal is to discover, develop, and support scholars and intellectuals with an appreciation for individual liberty and the classical liberal tradition of natural rights, private property, and free exchange. It accomplishes this through a program of seminars and fellowships for undergraduates, graduate students, and faculty members. It also serves as a clearinghouse of information for its worldwide network of distinguished scholars.

Institute for Information Technology
The Institute for Information Technology promotes research at George Mason University by serving as a liaison between the GMU research faculty and private research sponsors in such areas as library automation, applied artificial intelligence, advanced database research, and software engineering management.

Institute on the Federal Theatre Project and New Deal Culture
A clearinghouse of information on 1930s culture and politics, the Institute on the Federal Theatre Project and New Deal Culture coordinates exhibits and discussions of the Depression-era Federal Theatre Project, including programs co-presented with the Smithsonian's Air and Space Museum and National Museum of American History. The mainstay of the institute is the FTP archival collection, on permanent loan from the Library of Congress, which contains more than 7,000 original stage production scripts, 2,500 radio scripts, 500 posters, and hundreds of original stage and costume designs and photographs of FTP-sponsored Depression-era theatre productions. In addition, the institute has gathered
and organized existing audio tapes on all Works Progress Administration (WPA) arts projects. The institute publishes a newsletter, Federal One, which is mailed to more than 1,000 subscribers.

Law and Economics Center (LEC)
With the goal of furthering the development of law and economics as intellectually related disciplines, the Law and Economics Center (LEC) seeks to demonstrate the applicability of economics scholarship to legal policy and to relate economics to the substance and procedures of law. Located at the George Mason University School of Law in Arlington, the LEC offers residential programs for federal judges and law professors that provide participants with an introduction to economics. Comparable programs introducing academic economists to law are also offered. In addition, the center publishes Lexicon, a quarterly newsletter listing working papers, lecture series, conferences, and other programs, and sponsors a series of interdisciplinary symposia in which current topics in law and economics are explored.

Metropolitan Area Assessment Center
Supported by grants from the Virginia Department of Education, the center assesses the administrative skills of prospective school principals. Part of a nationwide program developed by the National Association of Secondary School Principals, the center annually trains 24 individuals to assess the skills of 48 candidates for positions in the Arlington, Alexandria, Falls Church, Fairfax, Prince William, and District of Columbia school systems.

Northern Virginia Writing Project
A statewide effort to improve the writing skills of Virginia students, kindergarten through university, the Virginia Writing Project has branches at public universities throughout the commonwealth. During the summer, teachers selected from each writing project area attend an intensive five-week program examining problems in effectively teaching good writing skills. Participants demonstrate successful teaching techniques, study research on writing, and write papers. After the summer institutes, the teachers return to their schools and lead seminars for other teachers in their districts.

Project for the Study of Young Children
Established by faculty members in the College of Education and Human Services, the Project for the Study of Young Children offers a cognitive-developmental program for preschool children and their families. In this environment, George Mason students and faculty members, Fairfax County public school teachers, and the parents of children enrolled in the program can study the educational development of these children. The project promotes collaborative, multidisciplinary research among students and faculty members; provides a program which encourages children's involvement with their environment by focusing on problem solving, discovery-learning, and cognitive skill development; and provides research and development services to Fairfax County public schools, the University community, Northern Virginia, and the state. The project is located at Fairfax High School.

Psychology Clinic
Operated by the clinical faculty of the Psychology Department, the Psychology Clinic offers psychological assessment services to members of the campus community and the Northern Virginia community. It not only serves as a site for faculty research but also provides graduate students with opportunities for direct service experience under professional supervision.

Public Management Institute
The Public Management Institute, a service and research branch of the Public Affairs Department, promotes a more effective exchange among government managers, business organizations, and the academic community by emphasizing the contributions each can make toward improving management in government. Drawing on University resources, the institute provides technical assistance to outside organizations by developing and conducting management education and training programs, organizing and leading conferences and workshops, and undertaking applied research to address current management problems.

Self-Care Institute
Affiliated with George Mason's School of Nursing, the Self-Care Institute examines the decision processes people use when monitoring their own health care. Founded in 1976 in Northern Virginia, the institute moved to George Mason in 1986 and plans to use its research results to teach consumers how to best use the health care system and teach health care professionals how to gear treatments to their patients' lifestyles.

Small Business Development Center
Supported principally by the federal Small Business Administration, the Small Business Development Center individually counsels owners of small businesses, conducts regular seminars of interest to entrepreneurs, and periodically provides students with learning experiences while working on cases which arise as part of the counseling activity.

Writing Research Center
A program of the NVWP, the Writing Research Center supports the work of teachers at all levels from throughout the state who study the writing practices of their students. The center's goals, the same as those of all other NVWP programs, are improved instruction and increased knowledge of the writing process. Schools, colleges, and universities wishing to improve writing instruction through in-service workshops and conferences can arrange for the NVWP to design and coordinate special training programs for their faculties.
Graduate Policies and Procedures
Graduate Policies and Procedures

Admission

Admission to the University and acceptance into a particular degree program are competitive. Space available is determined largely by the availability of resources. Demand for resources is balanced to meet the University's many educational responsibilities. The University, therefore, qualitatively evaluates students and makes selections based on performance and evidence of prospects for success.

For an applicant who wishes to obtain a graduate degree, the general University admission requirements are:

1. A baccalaureate degree or equivalent from an accredited institution of higher education.
2. A 2.75 GPA (on a 4.00 scale) or better in the last 60 hours of undergraduate study. (If postbaccalaureate study is undertaken, a separate GPA is calculated for each institution.)
3. Undergraduate preparation for the chosen field of graduate study.
4. Test scores and letters of recommendation as required by each program.

Departmental admission requirements for a degree student are listed in the catalog under the relevant discipline.

A degree-seeking applicant with a baccalaureate degree who has not met all other admission requirements may be offered provisional admission if there is sufficient evidence to suggest a capacity to pursue graduate work. A student in provisional status must have as initial objectives the removal of any deficiencies and advancement to degree status.

An applicant who is not interested in pursuing a graduate degree program but who wishes to take one or more graduate courses should request nondegree status in the Graduate School. Although the primary mission of the Graduate School is to conduct programs of instruction leading to graduate degrees, a qualified student who has no immediate degree objectives is welcome to the extent that available University and Graduate School resources allow. An applicant requesting nondegree status must submit a transcript showing that a baccalaureate degree has been earned at an accredited college or university.

Submission of Application

Requests for information about graduate admission, the application for admission and the necessary forms should be addressed to the Office of Admissions, Graduate Study, 117 Finley Building, George Mason University, Fairfax, VA 22030-4444, telephone (703) 323-2100. An applicant seeking admission to the Graduate School must submit the following:

1. An application form
2. Two official copies of transcripts from each institution attended, including George Mason University (undergraduate or extended studies enrollment), which must be received directly from the institution by the deadline date
3. A $20 application fee (nonrefundable)
4. A Virginia Domicile Classification form
5. Records of examinations (GRE, GMAT, etc.) mailed directly from ETS as required by certain departments (see admission requirements of appropriate program)
6. Letters of recommendation as required by departments (see admission requirements of appropriate program)
7. A notarized Affidavit of Support Form for Foreign Students (J-1 and F-1 visas)
8. A student from a non-English-speaking country must complete the Test of English as a Foreign Language (TOEFL) and attain a score of 575 or higher if required by an academic department. A TOEFL score of at least 600 is required of teaching and research assistants.

Application Deadlines

Master's Programs

Fall semester May 1
Spring semester November 1
Summer session March 1

(Only selected programs offer summer admission; see program for details.)

Doctoral Programs

Biology:
Fall, April 1
Spring, November 1
Economics:
Fall, April 1
Spring, October 1
Education:
Fall only, February 1
Information Technology:
Fall, May 1
Spring, November 1
Nursing:
Fall only, March 1
Psychology:
Fall only, February 15
Public Administration:
Fall, April 1
Spring, November 1

Graduate Admission Examinations (GRE and GMAT)

Although a number of graduate programs do not require the Graduate Record Examination (GRE), almost all will use such test scores as an additional measurement of an applicant’s qualifications. The GRE may be taken in either or both of two forms: (1) the General Test, and (2) the Subject Test. Some departments require official scores for both the General and the Subject tests. During 1988-89, the GRE will be administered locally and nationally on the following tentative dates:

- October 8, 1988
- December 10, 1988
- February 4, 1989
- April 8, 1989
- June 3, 1989 (General only)

The Graduate Management Admission Test (GMAT) is required of all applicants seeking an M.B.A., M.S. in Accounting, or M.S. in Information Systems. During 1988-89, the GMAT will be administered locally and nationally on the following tentative dates:

- October 15, 1988
- January 28, 1989
- March 18, 1989
- June 17, 1989

Academic Testing in the Office of Admissions administers all academic examinations for the University, including the GRE and the GMAT. Information concerning examinations, test applications and dates may be obtained from Academic Testing, Room 117 Finley, (703) 323-2525. Applicants also may write directly to GRE, Box 855, or GMAT, Box 966, Princeton, NJ 08549. A local telephone number in the Washington, D.C., area for the Educational Testing Service is (202) 659-0616.

Graduate School Foreign Language Tests

Certain graduate programs require students who have not already completed 12 hours of undergraduate credit in a foreign language to satisfy a foreign language requirement. This may be accomplished by taking the appropriate courses or demonstrating the equivalent proficiency by passing an examination. Information concerning the Graduate School Foreign Language Tests (GSFLT) may be obtained from Academic Testing.

Admission of International Students

International students who wish to apply to the University should apply directly to the Office of Admissions, 117 Finley. They must meet each of the following conditions:

1. Students must meet all requirements and regulations of the University and their school or department.
2. Students must present with their application for admission official documents certifying their previous educational training and attainments.

Graduate student applicants’ documents should show the award of either a bachelor’s degree or equivalent, or a graduate degree. Personal student papers, photostats, or attested copies are not accepted for evaluation purposes.

3. Students must have completed the Test of English as a Foreign Language (TOEFL) and normally attained a score of 575 or higher. A TOEFL score of at least 600 is required of teaching and research assistants. Foreign student applicants with undergraduate degrees from accredited universities in which the language of instruction for the program was English are exempted from this requirement. Information concerning the time and place of the TOEFL can be obtained from Academic Testing, (703) 323-2525, or from TOEFL, Educational Testing Service, Princeton, NJ 08549.

4. After applicants have received an offer of admission and sent a written acceptance, the 1-20 will be provided, upon request, to those requiring an F-1 student visa. International students must enter the United States on a valid student or other visa. Visitor or transit visas are not valid for enrollment at the University. Students sponsored by the U.S. government or their home government will be required to enter the U.S. on an Exchange Visitor’s visa (J-1).

5. The U.S. Department of Justice, Immigration and Naturalization Service regulations governing nonimmigrant F-1 students require that international students in this category pursue a full course of study (nine credits for graduate students) while maintaining nonimmigrant student status. Students on J-1 or F-1 visas are required to secure an affidavit of support proving that they have a sufficient amount of money to support themselves for the duration of their study. All students holding a J-1 visa or an F-1 visa are required to carry medical insurance either on their own or through the Office of International Programs insurance program. International students must meet and conform to all current regulations of the U.S. Immigration and Naturalization Service.

Admission Procedures

Admission of Graduate Degree Holders

An applicant holding one or more graduate degrees may earn an additional graduate degree in another discipline. For admission to a second graduate degree program, the applicant 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 at the University. 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 to the Graduate School

A written offer of admission is made by the Dean of the Graduate School to an applicant who has been accepted. The offer specifies the effective date of
admission, the category of admission offered, and
the name of the faculty adviser assigned to the
applicant. This offer of admission is good for two
semesters, provided the applicant does not take
course work elsewhere without prior written
permission of the Graduate School. The offer of
admission must be accepted by enrolling within two
semesters. An individual whose offer of admission
has lapsed must submit a new application and fee
to be reconsidered for admission at a later date.

Reactivation of Deferred Applications
Applicants are notified when action on an
application has been deferred pending completion
of prerequisite courses before graduate study in a
chosen field can begin. Such an applicant is
encouraged to notify the Admissions office in
writing as soon as the prerequisites have been met.
It is the responsibility of the applicant to furnish
official transcripts confirming that the prerequisite
courses have been satisfactorily completed even if
they were completed at the University. No
admission decision can be made until these grades
are received.

Records Maintenance and Disposal
All graduate admission documents, including
academic records sent from other institutions,
become part of the official University file and can
neither be returned nor duplicated for any purpose.
A student should maintain copies of official
credentials for other personal requirements.
Admission credentials are retained for 24 months
only and subsequently destroyed for applicants who
(1) do not register for courses within the time
period for which the offer of admission is valid, or
(2) have been denied admission, or (3) do not
respond to requests for additional information, or
(4) fail to submit complete applications with respect
to the receipt of all official transcripts and test
results.

Readmission to the Graduate School
A graduate student whose study at the University is
interrupted for any reason for a period of two
semesters or more (exclusive of summer sessions)
must apply for readmission. Readmission forms are
available through the Admissions office, 117 Finley.
The student is responsible for requesting that the
Registrar’s office forward to the Admissions office
a recent transcript of all work completed at George
Mason University. Since the department chair and
the dean of the Graduate School must approve all
readmissions, students are encouraged to
complete the forms and return them to the
Admissions office no later than one month prior to
the anticipated date of registration. A $20
nonrefundable fee must accompany the
readmission form. If such readmission is approved,
the student is subject to the academic regulations
and requirements in effect at the time of
registration after readmission. A student who is
readmitted may not count the six-year time limit as
beginning on the date of readmission. All degree
requirements must be completed within six years
from the date of initial registration as an admitted
(degree or provisional) graduate student.

Change in Field of Graduate Study
Admission to graduate study is contingent upon a
recommendation by the department in which the
student proposes to concentrate. Therefore, a
student is not free to change graduate programs at
will. A student who wishes to change from one
program to another in a new field of study must
submit a new application and fee for admission.
Previous acceptance into one graduate program
does not guarantee acceptance into another.

Termination of Admission
to Graduate Study
A student may submit an application to more than
one graduate program, but may be admitted to
only one graduate program at one time. Accepting
an offer of admission to a second graduate
program automatically terminates admission to the
first program. Admission also terminates when time
limits have been exceeded or when other conditions
for the continuation of admission have not been
met.

Extended Studies Enrollment
Administered by the School of Continuing and
Alternative Learning, the extended studies
enrollment procedure allows persons who may need
to satisfy prerequisites for graduate admission, or
who have no immediate degree objectives, to
request enrollment in courses for which they are
qualified without seeking admission to the
University. Extended studies enrollees are
restricted to undergraduate and 500- and 600-level
graduate courses. Credits earned by students as
extended studies enrollees are recorded on regular
University transcripts.

Extended studies enrollees who wish to apply for
graduate admission to the University may do so at
any time by following the regular graduate
admission procedures.

If a student applies for admission to the Graduate
School and is accepted into a degree program, a
maximum of 12 hours of graduate credit earned
through extended studies enrollment may be
applied toward a master’s degree program with
approval of the graduate dean. The student is
responsible for having transcripts of credits earned
through extended studies enrollment sent to the
Graduate School. After admission to the Graduate
School and during initial registration as a degree
student, the student is responsible for initiating
such a request on a Transfer of Credit Application
of Extended Studies Credit Form to apply extended
studies credit toward degree requirements. If the
student also has transferable credit from another
institution, the amount of applicable credit earned
through extended studies enrollment is reduced
accordingly.

Guest Matriculant
A graduate student admitted to another graduate
school may be given permission to register on a
temporary basis as a guest matriculant. This
admission as a visiting student is for one semester.
A guest matriculant must have been officially
admitted as a graduate student at another
recognized university and certified by his or her

http://catalog.gmu.edu
Permission to Register as a Graduate Student

Registration in the Graduate School is permitted only after the student has been notified of admission by the dean of the Graduate School. During course registration, admitted students are given preference over nonadmitted students if the number of applicants exceeds the enrollment limits. Dual registration (e.g., as a graduate student and as an extended studies 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 University, Graduate School, or departmental regulations.

Academic Advising for Graduate Students

At the time of admission to graduate study, the student is assigned a faculty adviser by the department 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 adviser. 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 a shared personal responsibility of the student and the adviser. The graduate student is responsible for compliance with the rules and procedures of the Graduate School and all applicable departmental requirements which govern the individual program of study. The student should consult with the adviser before registration each semester.

Schedule of Classes and Course Approval Form

In developing a program of study with the adviser, the graduate student will need to consult the Schedule of Classes, distributed before each registration period by the Registrar’s office. It provides information about the times and locations of classes, the names of course instructors, the final examination schedule, and procedures for paying tuition and fees. Dropping or adding a course and procedures for making other changes in registration are also outlined in the schedule.

The Schedule of Classes is mailed by the Graduate School to admitted graduate students. If a newly admitted student does not receive the Schedule of Classes in the mail, it is available in the faculty office as being in good standing. An application form for requesting guest matriculant status may be obtained from the Graduate School Admissions office.

Graduate Study During Summer Session

Applicants wishing to begin graduate work in summer must complete a Graduate School application for admission before submitting a summer session enrollment request form. There is a $20 nonrefundable charge for the application for admission.

Qualified students may also take graduate summer courses through the School of Continuing and Alternative Learning’s extended studies enrollment program.

Students who wish to complete graduation requirements during summer session enrollment should understand that the University does not necessarily offer all required courses in any particular summer session.

Senior Citizens Enrollment

The School of Continuing and Alternative Learning coordinates enrollment under the Senior Citizens Higher Education Act of 1974, as amended and as applicable to the University. Under the terms of this act, eligible Virginia residents over 60 years of age with a taxable income of less than $7,500 are entitled to enroll in courses offered for academic credit on a space-available basis without payment of tuition and fees.

In addition, the act provides for audit of course(s) offered for academic credit and also for enrollment in noncredit course(s) without payment of tuition and fees on a space-available basis, regardless of the taxable income level. Tuition may be charged, however, for courses designed exclusively for senior citizen groups. No senior citizen may change registration status in any given semester once he or she has registered for classes.
advisor's office. Continuing students will find schedules in their departments, at the information desk in the Student Union, at the information desk in Finley Building, and at the Registrar's office. No course listed in the Schedule of Classes will be offered for which there is insufficient enrollment. The University reserves the right to change the class schedule and to adjust individual section enrollments as necessary.

The Schedule of Classes also contains the Course Approval Form to be used at the time of registration. For each registration the student, consulting with the adviser, prepares a schedule of courses appropriate to satisfying degree requirements and individual needs. This schedule is then entered on the Course Approval Form. For newly admitted graduate students, the schedule of courses must be approved by the faculty adviser prior to registration.

Registration Procedures and Information
The Schedule of Classes contains instructions for registering. Any graduate student who fails to appear within the period specified for registration will not be permitted to register unless the delay can be explained to the satisfaction of the department chair.

As part of registration, each student is issued an official University identification card. It must be presented when obtaining a library card and may be required for admission to University events or when using University facilities after normal operating hours. It is not transferable and must be validated at registration each semester.

Each student is required to notify the Office of the Registrar and the Graduate School of any change of home address, telephone number, or change of legal name.

Student Information
Before or during each registration period, all students are asked to provide directory and other types of information used in preparing a student's education record and numerous statistical reports. Such information is collected and disseminated in compliance with the Family Educational Rights and Privacy Act of 1974, as amended, which provides that the University maintain the confidentiality of student education records and establish the right of students to inspect and challenge the data maintained in those records. Personally identifiable data from a student's education record may be released only to persons described in the Act, including "school officials with a legitimate educational interest."

The University may release directory information to any outside party at its discretion except when a student requests in writing that some or all directory information be withheld.

Category I of directory information includes student's dates of attendance; major(s); full- or part-time status; awards received.

Category II of directory information includes student's address; telephone number(s); date and place of birth; participation in recognized activities and sports; weight and height (normally given only for athletics); most recent previous institution attended; and other similar information.

Students desiring to withhold directory information from the public should request such withholding in writing to the registrar at the time of registration for a semester or summer session. Since such withholding may prohibit the registrar from providing confirmation of enrollment to prospective employers or even residence address to the student's own family, students who are considering such a request should consult the registrar.

Students may inspect their education records and obtain more information about the Privacy Act at the Office of the Registrar and may obtain copies of most parts of their records for a nominal fee. Those desiring to do so should schedule an appointment with the registrar.

Academic Load
Graduate students are urged to register each semester for only that number of hours which they can successfully complete. A normal full-time academic load is 12 semester hours. The minimum full-time academic load is nine hours per semester during the regular academic year. During the summer, a normal full-time academic load is nine semester hours for the entire session. Permission of the department chair is required to exceed the normal load.

Graduate students are expected to attend all of the class periods of courses for which they are registered and to meet all course requirements set by graduate faculty as scheduled for a class or seminar.

Graduate Course Enrollment by Undergraduates
A student may seek to take a 500-level graduate course either for reserve graduate credit or for undergraduate credit. A maximum of six hours may be earned for reserve graduate credit. Courses numbered 600 and above are closed to undergraduates.

Approval to register for reserve graduate credit (earned credit held in reserve to apply later toward a graduate degree) is normally given only to George Mason seniors within 15 hours of completion of undergraduate study. In addition, this privilege is normally extended only to seniors who have completed a minimum of 12 semester hours at the University, have a cumulative grade point average of 3.00 or better, have successfully completed all prerequisite courses and have a major in the department offering the courses. Permission must be obtained in writing prior to registration. Forms are available in the Graduate School Admissions office. It is the student's responsibility to obtain all signatures required and to submit a current transcript with the request.

Approval for reserve graduate credit does not imply approval for admission into a graduate program at the University or that credit so earned will be accepted at another graduate school. Credit for the same course is not given toward both graduate and undergraduate degrees.
Graduate School policy permits undergraduates to enroll in graduate courses numbered 500 to 599 and apply the credit earned toward an undergraduate degree. For details of requirements and procedures see Graduate Course Enrollment by Undergraduates in the Admission section of the undergraduate catalog.

Adding and Dropping Courses
To add or drop a course during the schedule adjustment period, a graduate student must complete a Schedule Change Request Form and submit it at the registration site. Forms may be obtained from the department, Office of the Registrar, or the registration site.

The last day for adding or dropping a course is two calendar weeks after and including the first day of classes.

Withdrawal from a Semester
A graduate student who is enrolled in one or more courses is considered in attendance until formally withdrawn by submitting an official withdrawal form. A graduate student who drops all courses in any semester must submit an official withdrawal form.

Upon approval by the graduate dean, a graduate student may withdraw from a semester after the drop period without academic penalty, but only for nonacademic reasons which prevent completion of the courses. A graduate student who stops attending a semester after the drop period without the dean’s approval receives F’s in all courses.

Upon withdrawal, the following notation is made on the student’s permanent record: *Withdraw voluntarily for nonacademic reasons on (date) in the (number) week of a (number) week semester
A list of the student’s courses follows, together with W grades.

A graduate student withdrawing before the final examinations in any semester or summer session forfeits credit for work done in that term.

The Graduate School may impose enforced withdrawal as a penalty for any fault which prevents the graduate student from fulfilling the purposes of enrollment.

Repeating a Course
A graduate student who has passed a course with a grade of B or better is not permitted to repeat the course. A graduate student may repeat a course in which a grade of C or below has been earned. Permission for repeating the course must be obtained from the department offering the course. Each department establishes procedures for granting permission for repeating a course.

When a course is repeated, all hours attempted count toward probation or dismissal; the transcript shows both the original and repeat grades; and only one grade per course may be presented on the degree application.

Auditing a Course
Auditing a course requires the permission of the department chair in which the course is offered. A previously audited course may be taken for credit at a later date. A graduate student may also audit a course previously taken and passed. A graduate student may not change from credit to audit status after the schedule adjustment period. The usual tuition and fees apply to audit status.

Final Examinations Policy for Graduate Courses
Written examinations are held at the end of each semester. No changes may be made in the announced examination schedule unless approved in writing by the department chair offering the course.

In certain graduate courses the assessment of student performance may be more closely related to written and/or oral papers; and because of the more intensive and continuous demands which should be placed upon students, it would appear appropriate to provide a degree of flexibility in connection with graduate examinations. Therefore, after consulting the department chair, the individual faculty member may exercise judgment regarding the use of a formal examination at the end of the course.

Absence from examination is not excused except for sickness on the day of the examination, or for other cause approved by the graduate dean. If such absence is unexcused or the examination is not taken within ten days, the grade on the course is entered as F. A student whose absence from an examination is excused may take a special examination within the 10-day period on a date to be arranged between the student and the instructor in charge of the examination. A request to take an examination late should be made on a Student Request Form and submitted by the graduate professor to the Graduate School office.

Grading System
The grading system for graduate credit is A, B (satisfactory), C, F (unsatisfactory). Theses and dissertations may be assigned a letter grade or S (satisfactory), NC (no credit), or IP (in progress). The mark of IN (Incomplete) may be given when all course requirements have been completed except for assigned papers or reports which the student has been compelled to postpone for reasons beyond the student’s control. Regulations concerning incomplete marks may be found under Change of Grade below.

Grade points for each semester hour are assigned on a scale of 4 for A, 3 for B, 2 for C, and 0 for F. A grade point score is computed by multiplying the value of the letter grade by the number of credits for the course. As an example, a student receiving an A in a three-semester-hour course earns 12 grade points. Dividing the number of grade points earned by the number of semester hours attempted gives the GPA. (Note: The marks of S, NC, and IP have no grade points associated with them and hours with such marks are not included in GPA computations. NC and IP have no negative impact on a student’s record.) A grade point average does not appear on the transcripts of graduate students.

Each faculty member is responsible for preparing course examinations and determining grades. Policies concerning the weight given to examinations in computing final grades and the
kinds of examinations used may differ according to the preferences of individual instructors.

Grade reports are sent to the student and to the adviser each semester in which the student is registered, including those in which the student withdraws. The report includes all courses for that semester and the grades received, the cumulative hours of satisfactory grades, and the cumulative hours of unsatisfactory grades.

Change of Grade

Final grades in courses for graduate credit may be changed only on the basis of the following two circumstances and procedures.

Change from Incomplete and In Progress to Letter Grade. For cause beyond reasonable control, a student may be unable to complete the course on schedule. In such cases, the instructor may assign a temporary grade of Incomplete (IN). If the student fails to complete all requirements in time for the instructor to assign a regular grade by the last day of classes of the next semester (exclusive of summer session), the mark of IN is changed by the registrar to F.

It is the student's responsibility to submit the work to the instructor with sufficient time for its evaluation.

While the mark of IN remains on the transcript, it is treated as an unsatisfactory grade and may contribute to dismissal. A mark of In Progress (IP) is used for courses numbered 999, 998, 799, 798, internship courses, and some other courses until such time as all course work is completed. IP is not treated as an unsatisfactory grade, nor is it subject to the time limit prescribed for IN. Note that IP can be changed to any regular grade, with one exception. When comprehensive seminars or other such registrations are repeated through successive registrations, then only the final registration receives a grade. The previous IPs remain unchanged in such cases.

Change of Final Grade. Once a final grade in a course has been recorded by the registrar, it can be changed only in cases of computational error or other justifiable cause approved by the graduate dean. (Refer to Challenge of Grade procedure below.) All changes of final grades must be initiated, approved, and recorded prior to the last day of classes of the next regular semester (exclusive of summer session).

Challenge of Grade

Although generally the individual faculty member must be the best judge of student performance, there may be instances in which a graduate student believes a grade has been assigned unfairly. In such cases the student should ask the professor to reconsider the grade. If the student is not satisfied, an appeal may be made to the department chair, who initiates procedures established by the department. No challenge of a grade is considered after the end of the drop period of the next regular session (exclusive of summer session).

Academic Dismissal

A graduate student performs satisfactorily during any academic period (semester or summer session) in which the student received satisfactory grades in more than two-thirds of the credit hours undertaken during that period. A graduate student is dismissed upon accumulating 12 hours of unsatisfactory grades in graduate-level courses. The notation of academic dismissal is affixed to a graduate student's official record.

Academic Termination

A provisional graduate student who fails to achieve at least a B, i.e., 3.00 GPA, after completing 12 hours of course work as a provisional student, will be terminated from provisional status. The notation of academic termination is affixed to a graduate student's official record. Provisional students will also be terminated after the accumulation of 12 course work hours of unsatisfactory undergraduate grades. Graduate and undergraduate grades are not combined in the calculation of hours toward termination or dismissal. However, nondegree students are terminated after the accumulation of 12 hours of unsatisfactory grades in graduate or undergraduate courses combined.

Change from Provisional to Degree Status

For a change from provisional status to be considered, a graduate student must have completed 12 semester hours of graduate course work in provisional status with at least a 3.00 GPA, supplied admission credentials, and removed all deficiencies as established in the student's letter of admission. Appropriate admission credentials, such as transcripts, letters of recommendation, or test scores needed for consideration for a change of status, must be submitted to the Graduate School office. Written confirmation from the Graduate School dean indicating the change of status will be sent to the student.

Credits earned in the provisional status may be used subsequently in meeting minimum hour and program degree requirements. However, a maximum of 12 graduate credits earned in nondegree status may be applied toward a master's degree. Students admitted in these categories are, therefore, strongly urged to obtain faculty guidance before beginning course work. Credits cannot be applied toward a graduate degree unless they are specifically approved for that purpose.

Change from Nondegree to Degree Status

A student admitted to the Graduate School in nondegree status may request a change to degree-seeking status within the same program by departmental and Graduate School approval on the Graduate School's Student Request form. Note that all admission requirements as normally defined by the student's program for degree status must be met (e.g., official transcripts, letters of recommendation, etc.). If the student intends to use credits earned in nondegree status toward a degree, the credits must be approved on the Graduate School's Transfer of Credit form.
Nondegree students are terminated after accumulating 12 hours of unsatisfactory grades.

Transfer of Credit for Work Taken Prior to Admission

With the recommendation of the appropriate program faculty and approval of the graduate dean, a graduate student may transfer up to six semester hours of graduate credit earned at other accredited institutions prior to acceptance and enrollment in the Graduate School to be applied toward the requirements for a master’s degree. Up to 12 hours of credit may be transferred within the Cooperative Graduate Engineering Program. Up to 12 semester hours may be applied toward a doctoral degree. In addition, if a student has earned a master’s degree prior to admission to a doctoral program, the number of hours required for the doctoral degree may be reduced.

Undergraduate courses taken at other institutions are not transferable for credit to graduate programs within the University. All graduate work offered as transfer credit must be applicable to the degree program the student is pursuing at the University.

Credit is normally considered for transfer, upon the request of the student, at the time of initial registration as a degree student. Transfer of credit requests from provisional students will not be considered until they are advanced to degree status. Written confirmation from the graduate dean of all credits approved for transfer will be sent to the student.

Criteria for Transferable Credit

Transfer work must meet a standard of recency; generally, credit must have been earned within six years prior to the time of admission.

In all cases of courses accepted for transfer of credit, including those taken within the Consortium for Continuing Higher Education in Northern Virginia and Continuing Education at George Mason, a minimum grade of B must have been earned, and the courses involved must be applicable toward a comparable degree at the institution offering the course. Extension and in-service courses which are not intended by the institution offering the courses to be part of a degree program are not acceptable for transfer to the University. It is the student’s responsibility to furnish evidence that any courses presented for transfer of credit would be applicable to a comparable degree at the institution where the credits were earned. If this information is not on the official transcript, it must be obtained in writing from the appropriate dean at that institution. The graduate dean decides whether work taken elsewhere and presented for transfer credit to a graduate program at the University is acceptable.

Courses at Other Institutions

After enrollment as a degree student and with the prior approval of the department chair and the graduate dean, a student may, when need exists, earn up to 6 hours of transfer credit applied to the master’s degree or 12 hours applied to the doctoral degree for graduate courses to be taken at another accredited institution. Up to 12 hours of credit may be transferred within the Cooperative Graduate Engineering Program. Permission to take a course elsewhere must be secured from the graduate dean prior to registering at the other institution. Forms are available in the Graduate School office. The student is responsible for requesting transfer credit for such courses after their completion and for having an official transcript submitted to the Graduate School office for evaluation of possible transfer of credit. Permission is not ordinarily given for a student to take a course elsewhere for transfer credit during the semester in which a student is advanced to candidacy or the semester in which the degree is to be awarded. Permission does not exempt a graduate student from satisfying the 18-hour minimum for a master’s degree or the 36-hour minimum for a doctoral degree of course work taken at the University. (See Requirements Applicable to All Graduate Degrees.)

Student Requests and Appeals

A graduate student who wishes to request an exception to published academic regulations or to appeal decisions involving the application of academic regulations to a program of study may do so by submitting a petition to the graduate dean. Such a request should be initiated by a graduate student and must be restricted to matters directly affecting academic progress. Graduate departments provide a mechanism for grade appeal. Thus all grade appeals should be submitted to the department responsible for the course.

The petition to the Graduate School must include the signature and recommendation of the graduate adviser and the department chair. It is the responsibility of the graduate student to present relevant information or documents in support of an appeal. If the request or appeal is to be heard by the Student Appeals subcommittee, the student will be notified of the time and place of the meeting. It is the decision of the graduate student whether or not to attend the subcommittee meeting to present written or verbal information. The subcommittee will make a recommendation to the graduate dean.

While such meetings are academic and collegial and not legal hearings, a student is welcome to present relevant supporting documents. No appeal can be made of the decision of the graduate dean.

Requirements Applicable to All Master’s Degrees

Master’s Degree Requirements

Candidates must satisfy all Graduate School degree requirements and all requirements set by the program faculty of the department in which the master’s program is offered. Specific departmental degree requirements are listed under the respective graduate programs in this catalog.

The following requirements apply to all master’s degrees:

1. A candidate must have earned a minimum of 30 semester hours of graduate credit.

2. Only graduate-level courses may apply toward the degree. A graduate student may apply up to
Graduate Policies and Procedures

six hours of C grades in graduate-level courses; all other work must be satisfactory.

3. Have completed at least 18 semester hours of graduate-level work at the University after having been admitted to degree or provisional status.

4. Have completed at least 24 semester hours at the University of which:
   a. A maximum of six semester hours may be in master's thesis research (799) or in master's project research (798).
   b. A maximum of two courses or six semester hours taken prior to academic year 1982-83 may be upper-level undergraduate courses approved for graduate credit.
   c. No more than 12 semester hours may have been earned through enrollment in nondegree status or through extended studies enrollment prior to acceptance in a degree program.
   d. No more than six semester hours may be transfer credit for course work taken prior to admission with the amount of applicable credit earned in nondegree status or through extended studies enrollment reduced accordingly (exceptions are noted under individual degree programs).
   e. A maximum of six semester hours may be transfer credit taken after admission to the Graduate School.

5. Have completed all courses submitted for the degree within a period of six years from initial registration as a graduate student (with the exception of transfer credit taken prior to admission).

Master's degree candidates are subject to the degree requirements in force at the time of their initial registration in degree or provisional status following admission. Degree candidates who have been readmitted following voluntary withdrawal for more than one semester are subject to the degree requirements in force at the time of their initial registration following readmission. All degree candidates have the option of graduating under the degree requirements in force at the time the degree is to be awarded.

Residence

Normally, at least 24 semester hours must be completed at the University. A completed master's degree program must include a minimum of 18 semester hours of course work taken at the University as a degree-seeking student.

Time Limit

A student must complete all degree requirements for the desired master's degree within six years from the date of initial registration as an admitted (degree or provisional) graduate student. A graduate student who terminates enrollment and subsequently is readmitted to the Graduate School in the same master's program may not count the six-year time limit as beginning on the date of readmission.

Foreign Language Requirement

Several master's degree programs require that a master's student demonstrate a proficiency in one or more foreign languages as part of the degree requirements established by the program faculty. Such a requirement is listed under the degree requirements for a specific master's degree in the academic program section of this catalog. Certification of the successful completion of the foreign language requirement should be sent by the academic adviser to the Graduate School office.

Thesis and Nonthesis Options

Requirements regarding a thesis vary with the degree program. A number of master's programs provide for either a thesis or nonthesis option. The quality of the work expected of the student electing the nonthesis option is identical to that of the thesis option. For further information, consult the section on degree requirements under each degree program.

Master's Thesis

When a thesis proposal has been approved by the appropriate department, the department chair sends to the graduate dean a copy of the thesis proposal, including the names of the master's thesis committee members. The student may enroll in the thesis research course (799) at the beginning of the next semester.

The master's thesis committee is named by the candidate's department chair, who also designates the major professor as chair of the master's thesis committee. The committee is appointed after consultation with the candidate and the adviser, and consists of at least three persons, one of whom may be chosen initially, or at a later date, from outside the department.

The major professor of the thesis committee is primarily responsible for directing and guiding the candidate's research and writing activities. It is the responsibility of the student to keep all committee members informed of the scope, plan, and progress of both the research and the thesis.

Any student wishing to elect the thesis option should obtain from the Graduate School office a copy of Guide for Preparing Graduate Theses, Dissertations, and Projects. The student is permitted to register in the thesis course (799) only after a thesis proposal has been submitted and approved as prescribed in the guide. Any student not in attendance at the University who is preparing a thesis under the active supervision of a member of the faculty, or who wishes to take an examination, must maintain continuous registration for at least one hour per semester.

Thesis Submission

The original and one copy of the thesis with signed cover sheet must be deposited with the graduate dean on or before the date specified in the Academic Calendar.

Degree Application for a Master's Candidate

Master's students who expect to complete all degree requirements in the semester must secure a degree application from the Office of the Registrar and return it completed with departmental signatures to the Graduate School office by the date designated in the Academic Calendar. There is a $15 graduation fee, which is payable at the
Requirements Applicable to All Doctoral Degrees

Degree Requirements

A candidate for a doctoral degree at George Mason University must satisfy all Graduate School degree requirements and all requirements established by the doctoral program faculty. Specific program degree requirements are listed under the appropriate academic programs in this catalog.

To meet the degree requirements applicable to all doctoral degrees, a doctoral candidate must:

1. Have acquired beyond the baccalaureate degree a minimum of 72 semester hours of graduate credit
2. Have completed at least 36 semester hours of graduate-level work at George Mason University after having been admitted to doctoral degree status
3. Have completed at least two semesters, not including the summer session, in continuous registration
4. Have filed in the Graduate School office a program of study approved by the doctoral supervisory committee within two years after admission to doctoral degree status of which:
   a. A maximum of 24 semester hours may be in doctoral dissertation research (999) or doctoral project research (998)
   b. No more than 12 semester hours of graduate credit may have been earned through enrollment in nondegree status or through extended studies enrollment prior to admission to doctoral degree status
   c. The number of hours required for a doctoral degree may be reduced if a master's degree has been earned prior to admission
   d. A maximum of 12 semester hours may be transfer credit taken after admission to doctoral degree status
5. Have passed a written doctoral candidacy examination as certified by the doctoral supervisory committee.
6. Have passed an oral final doctoral examination as certified by the doctoral supervisory committee and Graduate School representative
7. Have submitted to the Graduate School office and have defended at the time of the final doctoral examination a doctoral dissertation or doctoral project that has been approved by the doctoral supervisory committee, Graduate School representative, and the graduate dean
8. Have completed all degree requirements within five years following the semester of advancement to candidacy

Doctoral students are subject to the degree requirements in force at the time of their initial registration in doctoral degree status following admission to the Graduate School. Doctoral students who have been readmitted following voluntary withdrawal for more than one semester are subject to the degree requirements in force at the time of their initial registration following readmission. All doctoral candidates have the option of graduating under the degree requirements in force at the time the doctoral degree is to be awarded.

Residence

All doctoral students are required to spend a minimum of two consecutive semesters, not including the summer session, in continuous registration. The doctoral program of study must include a minimum of 36 semester hours of graduate work taken at George Mason University after admission to degree-seeking status.

Time Limit

A doctoral student must complete all degree requirements within five years following the semester of advancement to candidacy. A doctoral student who voluntarily terminates enrollment and is subsequently readmitted to the Graduate School in the same doctoral program after advancement to candidacy is still subject to the five-year time limit commencing with advancement to candidacy.

Doctoral Supervisory Committee

At the time a doctoral student is to be considered for advancement to candidacy, normally by the end of the second year of full-time graduate study, the dean of the Graduate School will appoint a doctoral supervisory committee upon recommendation by the department chair. The committee shall consist of a major professor and at least three other members of the graduate faculty, one of whom must be a member of the graduate faculty from outside the doctoral student’s department. Additional members may be appointed who are not members of the graduate faculty or who are from outside the University. The major professor shall be the chair of the committee. It is generally the responsibility of the doctoral supervisory committee to approve the program of study; certify the successful completion of the candidacy examination (which may include an oral part in addition to the written part); approve the doctoral dissertation, where required; and certify the successful completion of the final doctoral examination (which may include a written part in addition to the oral part). In addition, the graduate dean will appoint to the doctoral supervisory committee a Graduate School representative from the graduate faculty who will attend the final doctoral examination.
Doctoral Research Skill Requirements

Some doctoral degree programs require, as part of the degree requirements, demonstration of proficiency in a research skill area. These may take the form of a reading knowledge of the research literature in a foreign language, knowledge of a computer language, knowledge of statistical methods, or knowledge of a research tool specific to the discipline. Research skill requirements are included with the degree requirements for the specific doctoral degree. Where required, the certification of successful completion of research skill requirements must be completed for advancement to candidacy. Forms for certification purposes are available in the Graduate School office.

Program of Study

Normally, before the end of the second year of graduate study, but no later than consideration for advancement to candidacy, a doctoral student must submit a program of study for approval by the dean of the Graduate School. The program of study must include major courses to be completed, any supporting courses, research skills required, subject areas to be covered by the candidacy examination, and proposed date for candidacy examination. The program of study must be signed by the major professor and all members of the doctoral supervisory committee. Program of Study for the Doctoral Degree forms are available from each program’s doctoral coordinator.

Advancement to Candidacy

Advancement to candidacy implies that a doctoral student has demonstrated both a breadth and depth of knowledge in the field of study and is capable of exploring problems on the boundaries of knowledge.

A doctoral student should normally be considered for advancement to candidacy by the end of the second year of full-time graduate study. The candidacy examination includes a written part and may include, depending upon the particular doctoral program, an oral part. Where an oral portion is required, some programs consider the written and oral portions as one in determining the passing or failing of the candidacy examination, while in other programs the two parts may be passed or failed separately. Doctoral students should consult the degree requirements for each doctoral program as to the requirements for the oral, if required. The number of times a failed candidacy examination may be repeated, any time limits for repeating, and any time limits by which the candidacy examination must be attempted.

Before a doctoral student may be advanced to candidacy by the dean of the Graduate School, a doctoral student should have completed all doctoral program examinations required by the program faculty, have been certified in all doctoral research skills required, passed the candidacy examination, and be recommended by the doctoral supervisory committee. Report on Candidacy Examination and Recommendation for Advancement to Candidacy forms are available in the Graduate School office.

Doctoral Dissertation and Non-Dissertation Options

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

Although by no means less demanding, some of the professional doctoral degree programs do not require the preparation of a dissertation. These professional doctorates provide for other means by which the candidates may demonstrate their intellectual competencies and personal abilities.

Doctoral Dissertation

After the appointment of the doctoral supervisory committee by the dean of the Graduate School, a doctoral student should begin discussions with the student’s major professor to define a suitable problem for the dissertation. However, before a doctoral student may enroll for doctoral dissertation research (999), a dissertation proposal must be approved by the doctoral supervisory committee and sent to the dean of the Graduate School for approval. The content and format of the doctoral dissertation proposal may be found in the Guide for Preparing Graduate Theses, Dissertations, and Projects, which is available in the Graduate School office.

The major professor (director) of the doctoral supervisory committee is primarily responsible for directing a doctoral candidate’s research and guiding the preparation of the written dissertation. Format and style for the dissertation are discussed in the Guide for Preparing Graduate Theses, Dissertations and Projects. The guide also includes information on the number of copies required, binding, and submission of the dissertation for approval by the doctoral supervisory committee and the graduate dean. All copies of the dissertation must be submitted and fees paid before the doctoral degree will be awarded.

Dissertation Submission and Fee

The original and one copy of the dissertation must be deposited with the graduate dean on or before the date specified in the Academic Calendar. Any student not in attendance at the University who is preparing a dissertation under the active supervision of a member of the faculty, or who wishes to take an examination, must maintain continuous registration for at least one hour per semester.

Final Doctoral Examination

As soon as all degree requirements have been satisfied, including the completion of the doctoral dissertation where required, a doctoral candidate may arrange with his or her doctoral supervisory committee to petition the dean of the Graduate School to schedule the final doctoral examination.
The final doctoral examination shall include an oral defense of the dissertation where a dissertation is required by the doctoral program. It should also demonstrate the candidate’s intellectual command and maturity of judgment of those branches of the field of study chosen by the candidate in conjunction with the doctoral supervisory committee. Some doctoral programs may require, in addition to the oral portion of the examination, a written part as listed under the degree requirements for each doctoral program. Depending on the particular program, a passing or failing mark may be assigned to the oral and written portion independently or taken as a single examination.

At the close of the final doctoral examination, the doctoral supervisory committee will make final judgments for approving the doctoral dissertation, which may require some minor changes resulting from the oral defense. The doctoral candidate is responsible for making all required changes promptly, securing the signatures of the major professor and other members of the supervisory committee, and submitting the original and one copy to the Graduate School office for the graduate dean’s approval.

Doctoral Degree Application

At the beginning of the semester in which a doctoral candidate expects to finish all degree requirements, including the final doctoral examination, the candidate should submit to the Graduate School office a doctoral degree application with departmental signatures and pay the $15 graduation fee. Copies of the doctoral degree application form can be obtained in the Registrar’s office. The degree application should be submitted by the date designated in the Academic Calendar. If for any reason a doctoral candidate fails to complete all degree requirements in the semester for which the degree application was filed, a new degree application and a $15 graduation fee must be submitted by the next appropriate deadline.

Commencement Exercises for Doctoral Degree Recipients

Commencement exercises provide an opportunity for doctoral candidates to receive public recognition for their achievements. For those who have completed doctoral dissertations, the titles will be read at the time of the hooding ceremony. If a doctoral candidate cannot participate in the ceremony, then the candidate should notify the Office of the Registrar at least six weeks before the ceremony begins.

Honor System and Code

George Mason University shares in the tradition of an Honor System that has existed in Virginia since 1842. The Honor 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. Therefore, students are responsible for understanding the provisions of the code. In the spirit of the code, a student’s word is a declaration of good faith acceptable as truth in all academic matters. Therefore, 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 must report all alleged violations of the Honor Code to the Honor Committee. Any student who has knowledge of, but does not report, an Honor Code 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 made up of students selected by the student body and 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 follows:

Honor Code

To promote a stronger sense of mutual responsibility, respect, trust, and fairness among all members of George Mason University and with the desire for greater academic and personal achievement, we, the members of George Mason University, have set forth the following code of honor.

I. The Honor Committee

The Honor Committee is a group of students elected from the student body whose primary and indispensable duty is to instill the concept and spirit of the Honor Code within the student body. The secondary function of this group shall be to sit as a hearing committee on all alleged violations of the code.
II. Extent of the Honor Code

Duties of the Honor Committee:
The Honor Code of George Mason University shall
detail specifically with
A. Cheating and attempted cheating,
B. Plagiarism,
C. Lying,
D. Stealing.

A. Cheating encompasses the following:
1. The willful giving or receiving of an unauthorized, unfair, dishonest, or unscrupulous advantage in
teaching, examination, or other graded work. These
requirements should also be stated before each
test, examination, or other work. These
requirements should also be stated before each
test, examination, or other graded work to clarify
what is permissible.

Faculty members who witness an Honor Code
violation should proceed as outlined under
Procedure for Reporting a Violation.

IV. Responsibility of the Students

Students should request a delineation of policy from
each professor if none is given at the beginning of
each semester. Students should also request an
explanation of any part of the delineation that they
do not understand. It is the responsibility of
students to understand their professors’ policies
with regard to the Honor Code. It is also the
responsibility of students to understand the
provisions of the Honor Code.

All students in the University have the duty as
participating members of this community to report
to a member of the Honor Committee any
violations of the Honor Code within the prescribed
time as outlined under Procedure for Reporting a
Violation. This duty is important not only because it
enforces the Honor Code, but also because it gives all
students the opportunity to express their respect
for personal integrity and an honest academic
community.

V. Procedure for Reporting a Violation

All students or faculty members witnessing or
discovering a violation of the Honor Code shall
enlist, wherever and whenever possible, one or
more corroborating witnesses to the overt act. The
accuser(s) (student or faculty) will, within 15
working days from the date of realization, inform
the suspected party with a letter of accusation
provided by the Honor Committee. The Honor
Committee shall retain a copy of the accusation
letter. The letter must inform the suspected parties
that they have four working days to contact a
member of the Honor Committee and be advised of
their rights and options. The Honor Committee shall
commence an investigation, which will not involve a
presumption of guilt on the part of the accused.
Any member of the George Mason University
academic community who has knowledge of but
does not report an Honor Code violation may be
accused of lying under the Honor Code.

VI. Counsel for the Accused and Accuser

Counsel for the accused and accuser may be
provided by any member of the George Mason
University student community, including members
of the Honor Committee, but not including students
of the School of Law.

VII. Appearance of Witnesses

The Honor Committee may require any member of
the University community to appear as a witness
before the Committee at the time of the hearing.
All requests for such appearances shall be issued
by the chair of the Honor Committee, or by the
counsel appointed to that case. The appearance of
the accuser is required.
VIII. Verdict
To find a student guilty of an honor violation, there must be a four-fifths majority vote (four to one) for a verdict of "guilty." Clear and convincing evidence must be presented to find the student guilty.

A student may not be tried more than once for the same offense except when an appeal is granted.

IX. Penalty
If the accused is found guilty of an honor violation, the Honor Committee shall determine the nature of the penalty by majority vote. The Honor Committee is not restricted to any one kind of penalty but will determine a penalty commensurate with the seriousness of the offense. Typical of the range of penalties which may be given are:

A. Oral reprimand: An oral statement to the student given by the chair of the hearing. No entry is made on the student's scholastic record.

B. Written reprimand: A written censure which is placed in the confidential files of the Honor Committee and in the student's academic file, but is not made part of the student's scholastic transcript records.

C. Non-academic probation: Exclusion from holding or running for an elected or appointed office in any organization or activity associated with the University. Ineligibility to participate in any athletic or other activity representing the University on either an intercollegiate or club level, and ineligibility to serve as a working staff member of any student organization. This action is noted in the judicial administrator's file but is not made a part of the student's scholastic record.

D. Service hours: Library or other supervised University service hours to be completed by a specific time. Upon completion the hold on the student's records would be removed.

E. Failing grade: Recommendation in writing to the instructor for a grade of F for the work involved, or for the entire course. The student's permanent record will reflect the academic evaluation made by the instructor.

F. Recommendation of suspension from the University for one or more semesters: A student's scholastic record would read: "Non-academic suspension from (date) to (date)." The recommendation is made to the Assistant Vice President for Academic Affairs.

G. Recommendation of expulsion from the University: A student's scholastic record would read: "Non-academic expulsion as of (date)."

This penalty will be recommended to the Assistant Vice President for Academic Affairs only in extraordinary circumstances, such as for repeated offenses.

X. Appeal
A written request for an appeal detailing new evidence, procedural irregularities, or other sufficient grounds, which may have sufficient bearing on the outcome of the trial, must be presented to the chair of the Honor Committee within seven working days after the date on which the verdict was rendered.

The written request will be reviewed by at least three voting members who were not involved with the original case. If a new hearing is granted, no voting member from the original hearing may vote in a second or subsequent hearings of the same case.

XI. Keeping of Records
The records of the hearing shall be kept in the file of the Honor Committee. These records shall include a tape or a full transcript of the hearing and all evidence presented at the hearing. If the evidence belongs to any person other than the accused, the original shall be returned to the owner and a copy shall be kept with the records of the Honor Committee.

XII. Composition of the Committee
The Honor Committee shall be proportionally composed of students from each school and faculty advisor(s), although the latter shall be nonvoting members. Undecided majors, B.I.S. students, and continuing education students shall be considered together as a school. The total number of members, exclusive of freshmen, shall be as close to 17 as practicable. Four freshmen will be appointed in the fall to serve until the following spring election. One or more clerks appointed by the committee from the student body will serve as aides to the chair.

The chair of the committee will be elected by majority vote of the committee members. For a particular hearing, five members of the Honor Committee will be designated as voting members.

A faculty hearing adviser, as a nonvoting member of the committee, must sit with and advise the committee at all hearings. The faculty adviser and faculty hearing adviser shall be chosen by the Honor Committee.

Previous Honor Committee members may serve during the summer term.

XIII. Eligibility of Members
Any student who maintains a 2.0 grade-point average and is in good standing with the University shall be eligible for the Honor Committee. A committee member must maintain a 2.0 average to continue in office.

XIV. Election of the Honor Committee
The Honor Committee shall be elected in the spring semester. The term of office shall begin upon election and run until the following spring election. In the fall semester the chair shall appoint new members to fill any vacancies that have occurred and to fill the four freshman seats on the committee.

All appointments made by the chair are subject to a majority vote of approval by the remaining members.
XV. The Challenging and Voluntary Withdrawal of a Member of the Committee from Participation in a Particular Hearing

An accused who challenges the right of any member of the Honor Committee to sit in judgment on him or her must present cause to the chair of the hearing.

The hearing committee shall then decide the validity of the challenge with the challenged member abstaining from voting. A simple majority shall decide the validity of any challenge. A successfully challenged committee member shall not be present during the hearing.

A member of the Honor Committee who feels prejudiced as to the facts of the case, is a close friend or relative of the accused, or would not be able to render an impartial judgment shall withdraw from a specific hearing.

XVI. Provision for Amendments

Upon petition of 20 percent of the student body, amendments to or revisions of the Honor Code may be proposed for ratification, said amendments and/or revisions to be voted on by the student body as a whole. A two-thirds majority of the votes cast shall be necessary for acceptance of any amendment or revision.

The Honor Committee may also propose amendments to be voted on by the student body as described in paragraph one of this section.

Approved amendments will take effect immediately except that new provisions will not be applied to cases initiated prior to amendment.
Tuition, Expenses, and Financial Aid
Tuition, Expenses, and Financial Aid

Tuition and Fees

To undertake any form of academic study with George Mason University, an individual must be registered as a student and must pay the prescribed fees. Registration is not allowed if a student has outstanding financial obligations.

The in-state tuition rate applies only to students formally classified by the University as Virginia residents. New students are required to complete the Virginia Domicile Classification Form (available in the Office of Admissions) and submit it with the Enrollment Request Form. Returning students previously classified as out-of-state should also complete the form if they wish to request a change of classification.

Payments for tuition, room, meal plans, and other applicable fees are due at the Cashier's office on or before August 4, 1988, for the fall semester and December 19, 1988, for the spring semester (regardless of postmark).

An early registered student who cannot attend classes during the semester for which registered should cancel registration by written notice to the Office of the Registrar as outlined under Registration.

With a late fee of $25, payment of tuition will be accepted until August 11, 1988, for the fall semester and until January 5, 1989, for the spring semester. If payment has not been received by these dates, registration will be canceled for the applicable semester. Students whose classes are canceled because payment has not been received by August 11 for the fall semester or by January 5 for the spring semester must reregister or incur a $20 administrative fee. Affected students may attempt to build a new schedule on a space-available basis. Tuition and fees for courses added after the cancellation date must be paid on the same day courses are added or the registration will be canceled. Students who register and then withdraw from the University before classes begin or during the first first of classes, or who have courses canceled for nonpayment, are charged a $20 administrative fee.

<table>
<thead>
<tr>
<th>In-State Students</th>
<th>Out-of-State Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tuition and fees, per hour (less than 12 or more than 17 hours), per semester</td>
<td></td>
</tr>
<tr>
<td>Graduation Fee</td>
<td></td>
</tr>
</tbody>
</table>

Methods of Payment

By act of registration, students accept the responsibility for the charges of the entire semester, regardless of method of payment. Payment in full must be received at the Cashier's office on or before the due date, unless arrangements for an alternative method of payment have been made.

Credit Cards. Payment may be made by VISA or MASTERCARD. These payments may be made in person by presenting the card at the Cashier's office or by returning a copy of the bill with the appropriate information filled in. In either case, the Cashier's office will request a daytime telephone number in case of processing difficulties.

Installment Payment Plan. A monthly installment payment plan is offered through Academic Management Services (AMS) of Pawtucket, Rhode Island, for the 1988-89 academic year.

This plan allows a student to pay all or part of the annual tuition in 10 equal monthly installments without interest charges. Participation is renewable each year at an annual cost of $45. The enrollment fee also covers the cost of a Life Benefit Insurance plan, which guarantees payment of the balance of the budgeted amount in the event of the death of the parent who is contractually responsible for the payments.

Students should contact AMS at the toll-free number (800) 556-6684 for further information.

Deferred Payment Plan. A deferred payment plan is available for students whose tuition and fees for the semester exceed $510. Students using a deferred payment plan must return a signed copy of the deferred payment promissory note to the Student Accounts Office by no later than August 4, 1988, for the fall semester and December 19, 1988, for the spring semester. A $25 administrative fee is charged for this service. Students must pay at least one-half of the total fees as the initial payment, with the remaining tuition and fees payable in two equal installments.

Students are responsible for ensuring payment of installments on or before the due dates.

<table>
<thead>
<tr>
<th>In-State Students</th>
<th>Out-of-State Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application Fee</td>
<td></td>
</tr>
<tr>
<td>Tuition and Fees, full-time (12 through 17 semester hours), per semester</td>
<td></td>
</tr>
</tbody>
</table>

http://catalog.gmu.edu
Due Dates for Deferred Payments. Fall semester: second and third payments due September 7 and October 5, 1988.

Spring semester: second and third payments due February 15 and March 15, 1989. Payments must be received in the Cashier’s office on or before the due date.

Checks

Checks in payment of tuition, fees, fines, or other obligations to the University should be made payable to George Mason University. Second-party checks are not acceptable.

A check returned to the University by a bank results in a $15 penalty fee for the payer. Further, students who fail to make good such checks within five calendar days following notification by the Cashier’s office are placed on financial suspension without further notice.

Financial Suspension

All academic credit is withheld for students who are not in good financial standing with the University. This means that no transcripts of record are issued, no diplomas are released, and no registrations for a subsequent semester or term are permitted until outstanding obligations, including the reinstatement fee, have been paid in full. In instances where the outstanding financial obligation that caused the financial suspension is more than $50, a reinstatement fee of $25 is imposed.

Failure to Meet Financial Obligations

Late Fee. Failure to make any payment on or before the due date results in a late charge of $25.

Students failing to meet a financial obligation to the University are placed on financial suspension. In addition, failure to meet financial obligations to the University may result in placement of the delinquent account with a collection agency, withholding from subsequent tax returns, and other collection procedures as mandated by the commonwealth. The student is responsible for any additional costs incurred in the collection of delinquent accounts.

Fines owed libraries of institutions and participating public libraries of the Consortium for Continuing Higher Education in Northern Virginia similarly affect students’ status.

Reinstatement Fee. Students placed on financial suspension because of outstanding obligations in excess of $50 may not return to good financial standing with the University until all outstanding obligations—including late charges plus a $25 reinstatement fee—have been paid.

Refunds

If students withdraw from the University before the beginning of the semester or during the first week of classes, their tuition and fees, less an administrative charge of $20, are refunded. Assessed penalties are nonrefundable.

Tuition and fees are refunded on a graduated scale for subsequent voluntary drops and withdrawals during the second and third weeks of classes. The calculation of the amount of refund is based on the date of the drop or withdrawal as certified by the registrar. Hours dropped after the third week of classes must be paid in full. The refund scale is shown below and is posted in the display case on the first floor of Krug Hall. It is the student’s responsibility to be familiar with the refund scale. The refund process is initiated by the student, who submits a request to the Office of Student Accounts.

Refund scale per tuition hour

<table>
<thead>
<tr>
<th>Week 1 (100%)</th>
<th>In-State</th>
<th>Out-of-State</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$85.00</td>
<td>$176.50</td>
</tr>
<tr>
<td>Week 2 (66.67%)</td>
<td>56.70</td>
<td>117.70</td>
</tr>
<tr>
<td>Week 3 (33.33%)</td>
<td>28.40</td>
<td>58.90</td>
</tr>
</tbody>
</table>

Refund scale for rooms and meal plans

<table>
<thead>
<tr>
<th>Room</th>
<th>Meal Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Week 1 Total less $100</td>
<td>Total less $50</td>
</tr>
<tr>
<td>Week 2 66.7% of total</td>
<td>66.7% of total</td>
</tr>
<tr>
<td>Week 3 33.3% of total</td>
<td>33.3% of total</td>
</tr>
</tbody>
</table>

Off-Campus Courses

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

Credits Earned Elsewhere

A few George Mason University degree programs include academic credits which students must earn at other institutions. Students enrolling for academic credits at other institutions assume all financial responsibility for these arrangements.

Eligibility for In-State Tuition

To be eligible for in-state tuition charges, a person must have been domiciled in Virginia for a period of at least one year prior to the semester for which a reduced rate is sought. A person becomes domiciled in Virginia when legally capable of establishing a domicile and present in Virginia with the unqualified intention of remaining in the state permanently.

Domicile, however, is primarily a question of intent and the burden of proof of domicile is upon the student seeking the benefit of reduced tuition.

See the Office of Admissions for a copy of the complete domicile legislation.

Change of Domicile Classification

Students requesting a change of classification from out-of-state to in-state must file the required form before the first day of the semester for which in-state status is sought. Forms are available in the Office of Admissions, Room 117 Finley.

Penalties

A student who provides false information or refuses or conceals information for the purpose of achieving in-state status, or who fails to notify the University of a change of facts which might affect reclassification from in-state to out-of-state status, shall be required to pay retroactively any tuition and fees that would normally have been charged and shall be subject to appropriate disciplinary action.
Other Expenses

Cooperative Education Student Special Registration Fee. All cooperative education students who are on-site with employers are registered by the co-op office for a special noncredit course section to retain their full-time student status. Students on an alternating schedule are charged a $15 special registration fee for each semester they are on a work cycle without any classes (co-op students may take a maximum of six credits while working on an alternating schedule pending approval of their co-op coordinator).

Deposits. By the end of the second week of classes, students enrolled in a chemistry laboratory course must purchase from a cashier one laboratory card priced at $5, which covers breakage or loss of equipment. As such loss occurs, the card is punched for the cost of the item in question. Unused portions of the card which have been validated by the Chemistry Department are redeemed upon presentation to the cashier no later than May 31, 1989.

Transcript Fee. A fee of $2 is charged for the first copy of each transcript of record requested by students, and $1 for each additional copy ordered at the same time. Payment must accompany the request.

Graduation Fee. The University requires a $15 graduation fee. See "Application for Degree" for more information.

Motor Vehicle Registration Fees. Students who park their vehicles on University property must register them with the Parking Services Office and pay a fee for a parking decal, based on the following scale:

- $55 full academic year, September 1 through August 31 ($20 for a second vehicle).
- $35 semester, fall or spring ($20 for a second vehicle)
- $20 summer session ($20 for a second vehicle)
- $15 motorbikes

The Parking Services Office is at the rear of the West Building in T-102, and in SUB I, second floor, old Patriots Locker. (See Motor Vehicles Policy for more information.)

On-Campus Housing Costs (per year, 1988-89)

<table>
<thead>
<tr>
<th>Type</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student Apartments</td>
<td></td>
</tr>
<tr>
<td>1 Bedroom</td>
<td>$3,400</td>
</tr>
<tr>
<td>2 Bedrooms</td>
<td>$2,950</td>
</tr>
<tr>
<td>3 Bedrooms</td>
<td>$2,600</td>
</tr>
<tr>
<td>Residence Halls</td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>$2,950</td>
</tr>
<tr>
<td>Double</td>
<td>$2,600</td>
</tr>
<tr>
<td>Townhouses</td>
<td>$3,400</td>
</tr>
</tbody>
</table>

Meals (10-19 meals per week) $1,264-1,616

For more information, write or call the Director of Housing and Residential Life, George Mason University, Fairfax, VA 22030-4444; (703) 323-2354.

Financial Aid

Office of Financial Planning and Resources

The Office of Financial Planning and Resources provides a variety of services to help students finance their education. These services include financial counseling, referral and information resources, and financial assistance. Student financial assistance consists of grants, loans, and employment. Awards are based on financial need. Located in Student Union Building I, Room 354, the office is open Monday through Friday from 9 a.m. until 4:30 p.m., and Tuesday until 7 p.m.

To apply for financial aid, each year new and currently enrolled students must obtain a copy of the George Mason University Financial Aid Application and return the completed form to the Office of Financial Planning and Resources. In addition, students must complete a Financial Aid Form and forward it to the College Scholarship Service in Princeton, New Jersey, four weeks prior to the application deadline. The application deadlines for consideration of federal and most of the state funds are as follows:

- 1989-90 Academic Year
  - First Year Graduate Students: March 1, 1989
  - Returning Students: May 1, 1989
  - Summer 1989: April 1, 1989

Applications received after the deadline are evaluated according to the availability of funds.

The University administers federal, state, and other aid programs as outlined below.

Federal Programs

The Perkins Loan (formerly The National Direct Student Loan Program). Long-term, 5 percent interest loans from the federally sponsored Perkins Loan Program are available to qualified students. Repayment begins six months after graduation and may be deferred for students entering graduate school, the Peace Corps, VISTA, or military service, and may be deferred three years for those temporarily disabled. Students must be enrolled at least half-time to qualify. Half-time is defined as six credit hours for both undergraduate and graduate students.

Guaranteed Student Loan Program (GSL). Students must demonstrate need through the Financial Aid Form and be enrolled in a degree program at least six hours to qualify. Eligible students may borrow up to $7,500 per graduate grade level up to a total of $54,750 (including $17,250 of undergraduate GSLs). The government
pays the 8 percent interest until the repayment period begins six months after the student leaves school. Interest remains at 8 percent through the fourth year of repayment and increases to 10 percent beginning the fifth year of repayment.

Supplemental Loan Program (SLS). SLS is an additional form of financial aid to be used in conjunction with or in lieu of the Guaranteed Student Loan (GSL) program. SLS loans are available to students who are ineligible for the GSL program or need funding above the GSL amounts. This program can aid middle-income families and others who are not able to meet the cost of education through grants, scholarships, GSLs, and other financial aid programs. This is a non-need program, so anyone may participate. For specific information, contact the Office of Financial Planning and Resources.

Virginia Programs for State Residents

State Nursing Scholarships. The Bureau of Public Health Nursing provides limited scholarships to Virginia residents. These scholarships are based on need and are available to graduates and undergraduates. Applications are made directly to the Bureau of Public Health Nursing. The application deadline for students previously enrolled in a nursing program is March 1, and for new students entering a nursing program the deadline is June 1. Applications are available in the Office of Financial Planning and Resources.

Graduate Assistance

Graduate School Fellowships. George Mason University annually awards a limited number of University Fellowships. They are funded by the Commonwealth of Virginia and can be awarded in any department. The awards, based on merit, are intended to encourage and assist superior students in completing graduate studies in the shortest time possible. All recipients must enroll in full-time study. Applications must be submitted to the Graduate School for review by the department of the student’s major. Prospective graduate students must also have filed an application for admission to the Graduate School. For further information and an application, contact the Graduate School office at (703) 323-2124.

Outside Scholarships and Fellowships

Woodrow Wilson Foundation. The Woodrow Wilson Foundation provides funds for graduate fellowships to students planning college teaching careers in a liberal arts field. Although lack of funds curtailed grants in recent years, seniors interested in applying for such grants as they become available must be nominated by one of their professors in October. Consult the departmental adviser or the Woodrow Wilson campus representative for further information.

Zonta Scholarship. The Zonta Club of Fairfax offers a scholarship to a woman admitted to the Graduate School for study leading to a profession.

The field of study and the amount of award varies. Consult the Graduate School office for information and an application.

Other Fellowships and Grants. The American Association of University Women, the National Research Council, and other organizations administer graduate fellowships and grants. Contact the Office of Financial Planning and Resources.

Graduate Assistantships. The Graduate School offers a number of graduate teaching and research assistantships in departments with graduate programs. Assistantships are awarded on a non-need basis. A student holding an assistantship must be in degree status and must take at least six semester hours of graduate credit each semester. Stipends ranged from $4,850 to $10,000 for the 1986-87 academic year. Application for a graduate assistantship should be made to the chair of the department involved. For further information and an application contact the Graduate School office at (703) 323-2124.

In-Service Training Program for Teachers. Candidates for graduate degrees may establish eligibility to receive state funds for graduate study closely related to their field of work through one of the state’s division superintendents of schools. Candidates may use the funds to enroll at the University in previously approved courses.

Emergency Loan Program

Mary E. Ferguson Emergency Loan Program. Currently enrolled students may borrow funds for legitimate emergencies. Tuition and fees, books and supplies are not considered emergencies. Emergency loans must be repaid within 30 days; overdue payment results in a late charge of $5. Failure to repay the loan within 30 days, without requesting an extension for a reasonable excuse, will result in financial suspension. Students financially suspended for nonpayment of an emergency loan are ineligible for any future emergency loans.

Veterans Services

Veterans Educational Benefits

Students eligible for Veterans Educational Benefits while attending the University must contact the Office of Veterans Services. The following actions are required:

1. Veterans and active services duty personnel who have never received benefits must apply on Form 22-1990. The application should be turned in to the Veterans Services office on campus with a certified copy of the student’s DD-214 (if applicable).

2. Students who have received benefits from another school or who are changing either their type of program or course objectives must fill out Form 22-1995—Request for Change of Program or Place of Training.

3. Students must request the veterans’ counselor to send an enrollment certificate to the Veterans Administration Regional Office each school year (each semester, if the students are under half time, on active duty, or in continuing education).
Students must apply separately for a summer session. Students in continuing education will only be certified for two semesters while their GMU applications are pending.

4. Students are responsible for notifying the Veterans Services office on campus of any change in status. Such changes include:
   a. Adding or dropping courses
   b. Change in marital status
   c. Addition of a dependent
   d. Change of address (notify VARO immediately)
   e. Withdrawal from school (notify immediately)
Forms for making these changes are available at the Office of Veterans Services in Room 355 of Student Union I.

5. VA payments are made on the following basis:

<table>
<thead>
<tr>
<th>Hours</th>
<th>VA Payment Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>9 or more</td>
<td>Full time</td>
</tr>
<tr>
<td>6, 7, 8</td>
<td>3/4 time</td>
</tr>
<tr>
<td>4, 5</td>
<td>1/2 time</td>
</tr>
<tr>
<td>3</td>
<td>less than 1/2, more than 1/4</td>
</tr>
<tr>
<td>less than 3</td>
<td>1/4 time</td>
</tr>
</tbody>
</table>

Students on active duty and those taking fewer than four graduate hours are paid either tuition and fees or the rate set for the training time, whichever is less. The Veterans Administration will not pay for an audit course.

On July 1, 1985, Public Law 98-525 established a new GI Bill (Chapter 30). Details may be obtained from the Veterans Services office on campus.

Tutorial Services for Veterans. The VA will pay $84 per month, not to exceed $1,008 per year, for needed tutorial services. For further information contact the Veterans Services office on campus.

Virginia War Orphans Education Program. The Virginia War Orphans Program provides educational assistance to children of qualified veterans. To be eligible an applicant must meet the following requirements:

1. The applicant must be between the ages of 16 and 25.
2. The applicant’s parent must have served in the armed forces of the United States and must: (a) be totally disabled due to an injury or disease incurred in a time of armed conflict; or (b) have died as a result of injury or disease incurred in a time of armed conflict; or (c) be listed as a prisoner of war or missing in action.
3. The applicant’s parent must have been a resident of the Commonwealth of Virginia at the time of entry into active military duty, or must have been a resident of the state for at least 10 consecutive years immediately prior to the date of application.
4. The applicant must provide written verification of acceptance as a student in a state-supported postsecondary school.

Eligible individuals are entitled to a maximum of 48 months of tuition-free education at a state supported educational institution. For more information contact the Office of Veterans Services.
Student Life
Student Life

Student Support Services

George Mason University provides many support services designed to enhance the college experience and enable students to take full advantage of the University's educational and personal enrichment opportunities.

Student Unions

The two student unions are the center for most nonacademic activities. Student Union I houses offices of student service coordinators and student organization offices, as well as a large lounge area, an arts and crafts center, a mini-mall, a game room, a bank, a rathskellar, and food services. In Student Union II are a bookstore, cash and contract cafeterias, and meeting rooms.

Student Health Services

Personnel in the Student Health Services treat minor illnesses, administer first aid, and dispense nonprescription medications. They also provide referral services to outside health resources, offer information and counseling on matters of hygiene, and assist in the administration of a program of health and accident insurance and a student dental plan. Pregnancy tests, throat cultures, and mono spot tests are performed for a minimal fee. Abortion counseling and referrals are also offered. During the academic year, the health service emphasizes preventive health care. Programs in 1987-88 included blood pressure checks, Pap testing, and cardiopulmonary resuscitation instruction.

The staff includes a director, one full-time nurse, a part-time nurse, a health educator, and a consulting physician. Student Health Services is on the Main Campus in Student Union I, Room 232 (323-2584).

Health Insurance and Dental Plan

All students of George Mason University are eligible, on a voluntary basis, to enroll in the University-endorsed Accident and Sickness Health Insurance Plan and the University-sponsored dental plan made available through DENTICARE of Virginia.

The health insurance policy includes provisions for major medical coverage, outpatient laboratory fees and x-ray coverage, as well as the usual provisions for hospital room and board and surgical expenses. At minimal cost, this policy covers the insured student 12 months per year, 24 hours per day, worldwide, at the University or elsewhere. For a minimal fee per year, the dental plan provides x-rays, teeth cleaning, and office visits at no charge and various dental procedures such as fillings, crown and bridgework, and root canal therapy at reduced costs.

Health insurance brochures, enrollment applications, and claim forms, as well as dental plan information, may be obtained at the Student Health Service, Student Union I, Room 232, (703) 323-2584.

Services to Disabled Persons

Students with disabilities have access to a wide range of services and assistance. They may contact the Adviser to Students with Disabilities at (703) 323-2523 (Voice/TDD) for more information.

Housing

The University has on-campus housing for 1,800 students. Several types of housing are available including residence halls, apartments, and townhouses. Commonwealth and Dominion halls each house 250 residents in double occupancy rooms. The student apartments complex consists of nine three-story buildings that contain 121 apartments and house 500 residents. The Patriot Village complex consists of 21 buildings that house 189 residents. University Commons is an eight-building complex accommodating 500 students. University Park Townhouses is a 36-unit complex located a quarter mile from the Main Campus.

See Housing Costs under the Tuition, Expenses, and Financial Aid section of the catalog. For complete information about the University's on-campus housing, write or call the director of housing and residential life, (703) 323-2354. The Office of Housing and Residential Life will also supply information about off-campus housing.

Counseling Center Services

The Counseling Center is staffed by professional counselors who help students reach their academic, social, and personal goals. Counselors assist students in making appropriate choices concerning education and work, developing effective study skills, and learning to manage personal problems that interfere with learning.

Services are available at no charge to all University students. The main office is in Room 364, Student Union I, and is open Monday through Friday from 8:30 a.m. to 5 p.m., and Tuesday and Wednesday
evenings. For information about the following Counseling Center services, or for assistance, call 323-2165: mental health services; learning services; self-assessment; black peer program; re-entry program; consultation; training and supervision; and referral to other mental health practitioners.

The University Counseling Center is accredited by the International Association of Counseling Services. All services to students are confidential and no information is released without the student’s written consent.

Career Services

The Office of Career Services provides career counseling, career information, cooperative education, part-time and full-time job listings, and job hunting assistance to students and alumni. The office, located in Room 348 in Student Union I, is open Monday through Friday from 8:30 a.m. until 5 p.m. and on Tuesday and Wednesday evenings during the fall and spring semesters. For information call 323-2476. The following major services are offered:

Career Counseling. In individual counseling sessions and workshops, students learn a career-planning decision-making process that can be used throughout their lives. Thorough self-assessment of personal interests, skills, values, and motivations is emphasized prior to researching appropriate majors and relevant career opportunities. Counselors are also available to assist students with various aspects of their job search.

Career Workshops. These include Career Identification, Exploring Majors and Careers, Adult Career Planning, Applying to Graduate/Professional School, Job Hunting Strategies, Resume Writing, and Interviewing Skills. Check the Career Services brochure for the listing of workshop days and times. Evening programs are available.

Career Resource Library. This specialized library contains information on career fields, graduate and professional schools, government employment, researching employers, and job hunting. A computerized career guidance system is available, as well as handouts on resume writing and many other relevant subjects.

Cooperative Education. Cooperative education is a program that provides qualified students with professional-level, progressively responsible, paid work experience in positions related to their majors. Two calendar plans are available: the preferred traditional plan, in which students alternate periods of full-time work with periods of full-time study, and the parallel plan in which students attend school full time and work part time. Positions are open to both undergraduate and graduate students in all disciplines. Participation is recognized by the University through notation of the work assignments on academic transcripts. Orientation sessions are scheduled weekly to provide more complete information.

Internships. Internships can provide students with project-oriented experiences relating to their academic and career interests. Student employment assistants with the Employment Referral Service (ERS) provide a referral service to students interested in paid internships. Both paid and non-paid internship information is available in the Career Services Library and is posted on the job board. Internship opportunities are also forwarded to the appropriate academic departments.

Part-Time/Summer Employment Referral Service. The Employment Referral Service (ERS) is available to students who are interested in furthering their education through career-related work experience. Located in the Career Services office, Student Union Building I, Room 348, the ERS is staffed by student employment assistants who are trained to help students with their job search. After students register with the ERS, they have access to the part-time career-related job books, which are categorized by areas of study. Students are responsible for contacting the employer directly. Part-time and summer jobs that are not career related are posted in the glass case outside the Career Services office and do not require ERS registration.

On-Campus Interviews. During the fall and spring semesters, employers conduct interviews on campus for full-time career positions with their organizations. Graduating students and alumni can participate by first attending an orientation session, completing a registration form, and submitting it with a copy of their resume to the Office of Career Services. A schedule of employers is available at the beginning of each semester.

Job Leads. Graduating students and alumni can register to receive weekly bulletins of full-time job vacancies. Job notices are also filed in the Career Resource Library and posted on a job bulletin board outside the office.

Credential File. Graduating students and alumni may establish credential files containing references, resumes, and course listings to support application for employment or graduate school.

Veterans Services

The Veterans Coordinator in the University’s Office of Veterans Services assists veterans, service personnel, dependents, and survivors in obtaining authorized educational benefits. The office helps veterans adjust to university life. Located in Student Union I, the office is open Monday through Friday from 8:30 a.m. to 5 p.m., and two days a week until 7 p.m. during regular semesters. (Late days vary. Check with the office at 323-2381.)

Minority Student Services

Minority Student Services is an administrative office that provides coordination for the University, with respect to its planning and programming, for ethnic minority students. The office coordinates the student services that are housed within their respective administrative units and assists the University by providing continuity to services for
minority students. Helping students understand their academic needs and then find appropriate ways to meet them is an important function of the office. Minority Student Services is located in Room 352 of Student Union I. (703) 323-2383.

International Student Services

International Student Services assists international students to enter George Mason University and to resolve the problems of study and life in an American university.

Services consist of the following:

1. Evaluating overseas credentials of prospective international students and advising on admission as well as on transfer credit

2. Advising international students and scholars on immigration and visa requirements; cross-cultural understanding; and academic, housing, and personal problems

3. Organizing activities for international students and scholars to integrate them into the academic process, the campus student population, and the surrounding community

4. Conducting intercultural events on campus, such as International Week, United Nations Day, Ethnic Days, International Coffee Hour, films, and lectures

5. Representing international students at GMU before the U.S. Immigration and Naturalization Service, the State Department, government agencies in international education, and foreign embassies

6. Establishing links between international students and the local community through program activities and holiday hosting

7. Disseminating information via newsletters and other publications of importance to international students and their American counterparts

Student Activities

Student participation helps shape the character and the quality of the students and the University. Thus, George Mason encourages people to express their talents and interests through participation in student government, student publications, and through membership in academic, Greek, international, special interest, law, cultural, religious, and athletic organizations.

While involvement in such activities is a desirable adjunct to classroom learning, participation must be complemented by academic progress. For this reason, only students in good academic standing are eligible to hold or run for elective or appointive office in any organization or activity associated with the University, to participate in any athletic or other activity representing the University on either an intercollegiate or club level, or to serve as a working staff member of any student organization. It is the individual student's responsibility to notify an organization when becoming ineligible.

Performing Arts Activities

George Mason offers students the opportunity to participate in many arts events throughout the school year. The George Mason University Dance Company presents two annual concerts and all students are encouraged to audition.

Theatre events include four major productions, as well as several student-directed, one-act, and experimental plays. Auditions for theatre events are open to all George Mason students and are held each semester. Students interested in technical theatre can work in a variety of production crews, including light and sound, costumes, and publicity. Information concerning auditions, crew work, and performance dates may be obtained from the Department of Performing Arts (764-6200).

Students interested in music may audition to perform in the following: University Chorale, Symphonic Chorus, Symphony Orchestra, Symphonic Band, Jazz Ensemble, Pep Band, and various chamber ensembles. All members of the University community are invited to attend concerts and recitals given by the Department of Performing Arts.

Student Organizations

Approximately 130 on-campus student organizations complement the University's curricular programs and provide opportunities for
students to exercise and develop their talents. The organizations span a wide range of interests, including politics, forensics, drama, music, journalism, academic, service, recreation, business, social life, religion, and fellowship. Membership in student organizations is open to any registered George Mason University student and can open vistas to new friendships, informal contact with faculty and staff, learning opportunities, and leadership experience.

Recognized student organizations are also members of larger umbrella organizations. These clusters of organizations facilitate coordinated development of campus activities, interaction with other student organizations, and fee funding for student organizations. They also provide a University mailing address, access to file and storage space, duplicating services, and a channel of communication with the University administration regarding support services for student organizations.

The Student Activities office maintains updated information on names and phone numbers of contact persons in each organization. The Student Organization Manual, a "how-to" resource handbook for student leaders, can be obtained there. The office staff also consults with students or student organizations that are planning programs for students: assists new clubs in attracting members and receiving recognition; and offers leadership training through workshops, retreats, and credit course formats to organization members and to students not affiliated with a club.
Areas of Study
Areas of Study

Accounting

Faculty
Bradwick, Faye L., J.D., Syracuse University, 1984; CPA, Assistant Professor
Buchanan, Phillip G., Ph.D., Temple University, 1982; CPA, Associate Professor
Cao, Le T., D.B.A., University of Southern California, 1975; Associate Professor
Coffinberger, Richard L., J.D., Wake Forest University, 1974; Associate Professor
Heller, Kenneth H., Ph.D., University of Texas at Austin, 1977; CPA, Professor. Department Chair
Lynn, Susan A., D.B.A., University of Maryland, 1982; Assistant Professor
Millspaugh, Peter, J.D., American University, 1968; Associate Professor
Samuels, Linda B., J.D., University of Virginia, 1975; Associate Professor
Tucker, Michael J., Ph.D., University of Houston, 1980; J.D., New York University, 1974; CPA, Associate Professor
Wardlow, Penelope J., Ph.D., University of Georgia, 1985; Assistant Professor

Accounting, M.S.
The Master of Science in Accounting degree is administered by the Department of Accounting and Business Legal Studies. Course work leading to this degree is designed to provide the student with an additional university-level accounting program (either in the general accounting track or the taxation track), which combines with an undergraduate accounting degree to meet the five-year, 150-hour program supported by the accounting profession.

Admission Requirements
Degree applicants must fulfill the general admissions requirements of the Graduate School and submit a satisfactory score (normally 500 or higher) on the Graduate Management Admissions Test (GMAT). The GMAT must have been taken within seven years of applying for admission.

Admission to the M.S. degree program is competitive. The admissions decision is based principally on grades in prior academic course work at the undergraduate level and performance on the GMAT. These criteria are applied flexibly to ensure that individuals with unusual academic qualifications are not denied admission.

Degree Requirements
The M.S. program involves between 30 and 54 semester hours of graduate course work and also may require up to 24 hours of additional undergraduate credit. The exact number of credit hours for an individual is based on an evaluation by the department faculty at the time of admission.

M.S. in Accounting Core—General Accounting Track/Taxation Track (15 hours)
Each candidate in the general accounting track or the taxation track must complete the following accounting core courses unless, in the opinion of the department faculty, the candidate has had previous comparable graduate-level course work that would justify substitution of other graduate accounting courses.
1. ACCT 712 Accounting Systems
2. ACCT 713 Managerial Accounting Theory
3. ACCT 732 Financial Accounting Theory
4. ACCT 762 Advanced Auditing Theory and Practice
5. A tax course from the 700-level graduate tax courses

Graduate Electives—General Accounting Track/Taxation Track (15 hours)
Candidates in the general accounting track or the taxation track must satisfactorily complete at least 15 hours of graduate course work which does not repeat previous academic work.

General Accounting Track. Twelve hours must be taken from the courses shown below and must include three hours in accounting, three hours in financial management, three hours in decision sciences, and three hours in information resource management. The remaining three hours must be from graduate courses at the 600-level or higher, which may include DESC 611 and/or MKTG 775.

Accounting:
ACCT 733 Corporate Financial Reporting
ACCT 772 Fund Accounting
ACCT 782 International Accounting
ACCT 792 Seminar in Accounting
ACCT 796 Independent Study and Directed Readings
Any 700-level graduate tax course

Graduate Catalog 1988-1989
George Mason University
http://catalog.gmu.edu
Areas of Study

Financial Management:
FNAN 611 Cases in Financial Administration
FNAN 712 Security Analysis
FNAN 713 Portfolio Analysis
FNAN 714 Long-term Financial Management
FNAN 772 Managerial Economics

Decision Sciences:
DESC 611 Quantitative Analysis in Business and Operations Management
DESC 742 Management Science

Information Resource Management:
Information Resource Management courses at the 700-level as shown in this catalog

Taxation Track. Twelve additional hours must be taken in taxation. ACCT 740 is required. The remaining nine hours of taxation must be from any combination of 700-level graduate tax courses. The remaining three hours must be from 600-level or higher graduate courses, which may include DESC 611 and/or MKTG 775.

Accounting Courses for Students Without an Undergraduate Accounting Degree (24 hours)

ACCT 201 Financial Accounting*  
ACCT 202 Managerial Accounting**  
ACCT 311 Cost Accounting  
ACCT 331 Intermediate Accounting I  
ACCT 332 Intermediate Accounting II  
ACCT 351 Federal Taxation  
ACCT 461 Auditing  
BULE 301 The Legal Environment of Business  

*ACCT 610 may be substituted.  
**ACCT 611 may be substituted.

Graduate Courses Required for Students Without an Undergraduate Business Degree (30 hours).

BULE 610 Law and the Business Environment  
DESC 610 Statistical Foundation for Business Decision Making  
FNAN 602 Managerial Economics  
FNAN 610 Financial Management  
IRM 610 Computer Systems for Management  
MGMT 610 Management Theory and Practice  
MGMT 797 Business Policy  
MKTG 610 Marketing Concepts and Processes  
DESC 611 Quantitative Analysis in Business and Operations Management*  
MKTG 775 Theory and Policies of International Business**  

*DESC 301 may be substituted; DESC 611 may be presented as a graduate elective  
**MKTG 407 may be substituted; MKTG 775 may be presented as a graduate elective

Accounting Courses (ACCT)

610 Accounting and Reporting (3:3:0). Prerequisite Graduate standing. All aspects of accounting from the basic concept of a transaction through financial statements and their interpretation.

611 Managerial Accounting (3:3:0). Prerequisite ACCT 610 or equivalent and graduate standing. Topics include profit planning, relevant costing, budgeting, measurement of performance, and product costing.

712 Accounting Systems (3:3:0). Prerequisite ACCT 611. Accounting systems design and integration with other information systems.

713 Managerial Accounting Theory (3:3:0). Prerequisite ACCT 611. Controllership function in public or private organizations, particularly in regard to development of policy and evaluation of performance.


740 Tax Research (3:3:0). Prerequisite 24 credits of graduate and/or undergraduate accounting courses. Study of the process necessary to research a tax problem, to arrive at a defensible solution, and to communicate that solution. Emphasis is on the tools of tax research: Internal Revenue Code, Treasury Regulations, and administrative and judicial sources of tax law.

741 Corporate Federal Income Taxation I (3:3:0). Prerequisite 24 credits of graduate and/or undergraduate accounting courses. Concepts and principles that relate to federal income taxation of corporations and their shareholders. Emphasis is on research of fact situations. Coverage includes organizing and capitalizing a corporation, nonliquidating and liquidating distributions, penalty taxes, collapsible corporations, and determinants of the income tax base of corporations.


743 Partnership Taxation (3:3:0). Prerequisite 24 credits of graduate and/or undergraduate accounting courses. Major aspects of taxation affecting partners and partnerships. Emphasis is on tax planning and detailed study of the Internal Revenue Code, Treasury Regulations, and case law governing these areas.

744 Federal Estate and Gift Taxation (3:3:0). Prerequisite 24 credits of graduate and/or undergraduate accounting courses. Concepts and principles that relate to federal estate and gift taxation and the federal income taxation of estates, trusts, and beneficiaries. Emphasis is on estate tax planning and a detailed study of the Internal Revenue Code, Treasury Regulations, and case law governing these areas.
752 Federal Taxation and Business Planning (3:3:0). Prerequisite ACCT 611. Topics include organizations, acquisitions, mergers, spinoffs, and other divestitures, from viewpoint of profit planning, cash flow, and tax deferral. Emphasis on tax problems of corporations. This course is not available to M.S. in accounting students.

762 Advanced Auditing Theory and Practice (3:3:0). Prerequisite ACCT 611. Auditing standards and supporting theory. Application of techniques including statistical sampling. Legal liability of the auditor, role of the auditor in securities regulation, and auditing in a computerized environment.


782 International Accounting (3:3:0). Prerequisite ACCT 611. Principles, practices, and techniques used by multinational enterprises in international trade and investment. Topics include financial and managerial accounting, auditing, foreign currency translations, and U.S. tax policy toward the multinational firm.

792 Seminar in Accounting (3:3:0). Prerequisite 24 hours in the graduate program. Study of selected areas in accounting theory, practice, and methodology, and the influence of selected aspects of other disciplines upon the development of accounting concepts.

796 Independent Study and Directed Readings (3:0:0). Prerequisites Foundation and core courses. By special arrangement with professor and approval of the accounting chair.

799 Thesis (6:0:0). Prerequisite 30 hours of graduate course work beyond the foundation.

Biology

Faculty
Adamkewicz, S. Laura, Ph.D., University of Virginia, 1968; Associate Professor
Andrykovitch, George E., Ph.D., University of Maryland, 1968; Associate Professor
Birchard, Geoffrey F., Ph.D., Dartmouth Medical School, 1985; Assistant Professor
Bradley, Ted R., Ph.D., University of North Carolina, 1968; Associate Professor
Brown, Luther, Ph.D., Ohio State University, 1978; Associate Professor
deFur, Peter L., Ph.D., University of Calgary, 1980; Assistant Professor
Emsley, Michael G., Ph.D., University of London, 1964; Professor
Ernst, Carl H., Ph.D., University of Kentucky, 1969; Professor
Gretz, Michael R., Ph.D., Arizona State University, 1981; Assistant Professor
Hart, Jayne T., Ph.D., University of Wisconsin, 1969; Professor
Hellotla, Francia D., Ph.D., University of Wisconsin, 1965; Associate Professor
Jonas, Robert B., Ph.D., University of North Carolina, 1981; Assistant Professor
Jones, R. Christian, Ph.D., University of Wisconsin, 1980; Associate Professor
Kaplan, Ruth A., Ph.D., University of Wisconsin, 1970; Associate Professor
Keiso, Donald P., Ph.D., University of Hawaii, 1970; Associate Professor
Lawrey, James D., Ph.D., Ohio State University, 1977; Associate Professor
Oates, Karen K., Ph.D., George Washington University, 1985; Assistant Professor
Rockwood, Larry L., Ph.D., University of Chicago, 1972; Associate Professor, Department Chair
Royt, Paulette A., Ph.D., University of Maryland, 1974; Associate Professor
Shaffer, Jay C., Ph.D., Cornell University, 1967; Professor
Sherald, Allen F., Ph.D., University of Virginia, 1973; Associate Professor
48 Areas of Study

Skog, Judith E., Ph.D., Cornell University, 1972: Associate Professor
Stanley, Melissa S., Ph.D., University of Utah, 1965: Professor
Taub, Stephan R., Ph.D., Indiana University, 1980: Professor
Torzilli, Albert P., Ph.D., University of Georgia, 1976: Associate Professor
Wilson, John W., Ph.D., University of Chicago, 1972: Associate Professor

Biology, M.S.

The Master of Science program in Biology is designed to provide advanced training for recent college graduates, professionals in teaching, technical, and other biology-related fields, and research-oriented individuals.

Admission Requirements

An applicant for the M.S. program is expected to have a bachelor's degree in biology or its equivalent with a grade point average of 3.00 or better in biology courses, and must submit scores on the Graduate Record General and Subject Biology Examinations, and three letters of recommendation. To be accepted as a degree student, an applicant's scores on the verbal and quantitative general test should total 1,100 or greater, and should be in the 50th percentile or better on the subject biology portion, with no raw subscore less than 60 (40th percentile).

Degree Requirements

A student must complete at least 30 semester hours, including two hours of seminar, one of which must be Biology 690: Introduction to Graduate Studies in Biology. Initially, a student is assigned an academic adviser. The student must form a three-member graduate committee within the first 15 hours of course work. At the conclusion of the program, the student must successfully complete an oral and written comprehensive examination or defend a thesis. Students who complete a thesis will present their research in a public seminar. The basic requirements for each specialization are detailed below.

1. Organismal Biology: An organized set of course work is developed after consultation with an academic adviser. Traditional programs of study such as botany, vertebrate zoology, developmental biology, animal behavior, genetics, or physiology may be included in this specialization.

2. Environmental Biology: A student electing this specialization must take Biology 640 and 641: Environmental Biology I and II, and must complete at least one semester of Biology 692: Seminar in Environmental Biology. The remaining hours will be selected from a list of environmentally oriented courses in consultation with the academic adviser. The student is encouraged to take one or two courses outside of the department, subject to approval by the graduate committee.

3. Systematic, Evolutionary, and Population Biology: The student must complete a program of study selected from a list of courses emphasizing evolutionary and systematic biology. These courses must be approved by the academic adviser and will include one course from each of three areas: evolution, populations, and experimental biology.

4. Molecular, Microbial, and Cellular Biology: The student must complete three hours of seminar in addition to Biology 690. In consultation with the academic adviser, the student may enroll in Biology 691: Current Topics in Biology and/or Biology 695: Seminar in Molecular, Microbial, and Cellular Biology. All further course work is selected after consultation with the academic adviser.

5. Interpretive Biology: This specialization is designed for individuals currently or recently employed in interpreting biology to the public, including teachers, park naturalists, and science writers. Three to nine hours are chosen from BIOL 504, 601, 602, 605, or approved graduate courses in other departments. The remaining 21 to 27 hours will be graduate-level biology courses and must include two hours of seminar. All courses must be approved by the student's graduate committee.

Environmental Biology—Public Policy, Ph.D.

The objective of the Ph.D. program in environmental biology—public policy is to offer training in the traditional research-oriented disciplines of ecology and environmental biology as well as in public affairs, business administration and economics. Graduates will possess research, technical and administrative skills that should enable them to deal effectively with pure and applied environmental research, policy issues, environmental legislation, and implementation of environmental law. Prospective students who are already employed as environmental biologists by government, industry, or consulting firms have the opportunity to upgrade and broaden their skills. Recent bachelor's or master's degree recipients gain practical experience and important contacts during the internship phase of their training.

Admission Requirements

An applicant should have a bachelor's degree in biology or the equivalent, with an overall grade point average of at least 2.75 (on a scale of 4.00) in the last 60 hours of undergraduate work and a 3.00 average in all biology courses. A student who applies for graduate work but who lacks a bachelor's degree or master's degree in biology must complete a program of undergraduate course work as designated by the doctoral coordinator acting in consultation with the doctoral committee in the Department of Biology. The application deadline for admission in the fall semester is April 1 and for the spring semester, November 1.

All applicants for degree status must submit:

1. Scores on the Graduate Record Examination, including the Subject Test in Biology as stated above;

http://catalog.gmu.edu
2. Three letters of recommendation.
3. Official transcripts from each college or university attended.
4. A recent resume.

An interview with the doctoral coordinator is encouraged.

Degree Requirements

Because graduate courses in the Department of Biology are offered in the late afternoon or evening hours, course work for the Ph.D. degree may be completed on a part-time basis. The Ph.D. in environmental biology—public policy requires 78 semester hours of study beyond the bachelor's degree, 30 of which may be from master's-level work or its equivalent. At least 48 hours of work must be completed at George Mason University. The following requirements must be satisfied:

1. A minimum of 22 hours of graduate course work in biology, computer science, and statistics. These 22 hours will include at least two courses in each of the following areas: quantitative ecology, aquatic or terrestrial ecology, and applied ecology; a minimum of two semesters (four semester hours) of doctoral-level environmental biology seminars (BIOL 990, 991) are also required.
2. One or two graduate-level courses each from a selected list of courses in two areas of economics, business administration, and public affairs for a total of 15 semester hours. Each student is responsible for acquiring specific prerequisites or obtaining permission from the instructor to enroll in these graduate-level courses.
3. An internship. Up to 12 semester hours may be earned by fulfilling the internship requirement; the internship may be with an approved industry, government agency, consulting firm, or a professional scientific organization. Internships will be negotiated or waived on a case-by-case basis by the Biology Department with the student; the student's committee, after assessing the strengths and interests of the student and identifying available organizations or scientific mentors, will determine the location, duration and other terms of the internship.
4. A course in environmental law.
5. A Ph.D. dissertation—12–24 semester hours may be earned.

Sequence of Study

Upon admission to the program, a plan of course work will be developed by the student and his or her committee. As soon as possible, the student should establish a supervisory committee, consisting of a major professor and at least two environmental biologists in the department. When course work has been completed, a second phase of the program will be entered, namely advancement to candidacy. The student will be advanced to candidacy upon (1) enlarging the supervisory committee to include two other members, one of whom must be from one of the nonbiology departments participating in the doctoral program; (2) successful completion of a written (and optional oral) qualifying examination; and (3) submission of an acceptable dissertation proposal.

Residency, Candidacy, and Other Requirements

A student must advance to candidacy (complete the qualifying examination) within five years of initial registration. Once advanced to candidacy, however, a student is expected to be in continuous residence on a full-time basis. The minimum period of full-time residency is one year. The dissertation and final examination must be completed within six years after advancing to candidacy.

Electron Microscopy Laboratory

This facility provides high-resolution transmission and scanning electron microscopic facilities for the University community. The laboratory supports faculty research in such areas as investigations of fine structure of marine bacteria, algal polysaccharide immunocytochemistry, fern ultrastructure, and fine structure of epithelial and muscle cells in animals, and also serves several local agencies. An ultrastructure course offered each year provides graduate and undergraduate instruction for use of the facility.

Biology Courses (BIOL)

504 Virginia Natural History for Teachers (4:3:3). Prerequisite Permission of instructor. The interrelations of plants, wildlife, soil, and waters of local environments with emphasis on the teaching of their proper use and conservation. May be applied to the M.S. in biology in the interpretive track only and then within a six-hour maximum if combined with BIOL 605.

513 (531) Food, Energy, and Insects (3:3:0). Prerequisite BIOL 332, permission of instructor. History and future of man's competition with insects in fields of agriculture and medicine.


520 Systematics in Complex Angiosperm Families (3:1:6). Prerequisite BIOL 344 or 534 or permission of instructor. Morphology and specification of the more complex families such as Poaceae, Cyperaceae, and Asteraceae. Lab emphasizes identification of specimens and acquaintance with taxonomic literature.

523 (623) Reproductive Strategies (3:3:0). Prerequisite Permission of instructor. Evolution of reproductive tactics, including sexual and asexual reproduction, sex ratios, parental investment, propagule sizes and numbers, mating systems and social structure. Animals and plants emphasized as appropriate.

526 Paleoeology (4:3:3). Prerequisite Permission of instructor. Study of origin and evolution of interrelationships between components of the earth's major ecosystems.
Areas of Study

527 (727) Current Problems in Evolutionary Theory (3:3:0). Prerequisite Course in evolution or permission of instructor. Course on contemporary evolutionary thought.

529 Vertebrate Paleontology (4:2:6). Prerequisite Course in vertebrate zoology or comparative anatomy or invertebrate paleontology, or permission of instructor. Study of evolutionary patterns of vertebrates. Emphasis on major adaptive radiations.

532 (632) Animal Behavior (3:3:0). Prerequisite BIOL 324 or permission of instructor. Study of the ecological aspects of animal behavior.

533 Selected Topics in Plant Biology (3:3:0) or (3:2:3). Prerequisites 8 hours in 100-level BIOL, upper-division course in botany, and permission of instructor. Topic depends upon the specialty of the instructor. May be repeated only with permission of chair.

534 Speciation and Field Studies in Flowering Plants (3:1:6). Prerequisite Course in plant taxonomy or permission of instructor. Modes of speciation in flowering plants. Lab emphasizes field trips, collection, preparation, and identification of plants.

535 Paleobotany (4:3:3). Prerequisite Plant morphology or anatomy or vertebrate or invertebrate paleontology. Evolution of fossil plants, their origin, history, and extinction, including the various selective pressures responsible for these events. Lab presents techniques to elucidate fossil plant structure. Three Saturday field trips. Fall.

536 Ichthyology (4:3:3). Prerequisite Course in ecology or permission of instructor. Study of the systematics, evolution, physiology, ecology and behavior of fishes.

537 Ornithology (4:2:6). Prerequisite Course in ecology or permission of instructor. Study of the evolution, systematics, physiology, ecology and behavior of birds, emphasizing field work. Spring of odd-numbered years.

538 Mammalogy (4:2:6). Prerequisite Course in ecology or permission of instructor. Study of the evolution, systematics, physiology, ecology, and behavior of mammals, emphasizing field work. Fall of odd-numbered years.

539 Herpetology (4:2:6). Prerequisite Course in ecology or permission of instructor. Study of the evolution, systematics, physiology, ecology and behavior of amphibians and reptiles, emphasizing field work. Spring of even-numbered years.

543 (644) Tropical Ecosystems (4:3:3). Prerequisite Course in ecology or permission of instructor. Terrestrial, aquatic and marine ecosystems in the tropics emphasizing plant communities and plant–animal interactions, and the role of man in the tropics. Field trip to the tropics is required as part of lab.

546 (646) Estuarine and Coastal Ecology (4:3:3). Prerequisites Course in ecology and permission of instructor. Emphasizes marine biology of estuarine and coastal habitats of the Chesapeake Bay region and factors affecting distribution and abundance of organisms. Lab provides training in field measurement of physical and chemical parameters and collection and identification of local organisms. Extended field trips made to mid-Atlantic sites. Summer.

547 (647) Terrestrial Plant Ecology (4:3:3). Prerequisite Course in ecology. Consideration of community organization, development, productivity and mineral cycling, interactions between plants and competitors, herbivores and various environmental factors, especially light, water and soil. Field and lab emphasize data collection and statistical analysis.

553 Advanced Topics in Immunology (3:3:0). Prerequisite BIOL 452 or permission of instructor. A comprehensive study of immunologic mechanisms as they pertain to immunologic diseases and transplantation.

556 Microbial Physiology and Metabolism (3:3:0). Prerequisite BIOL 383 or permission of instructor. A comprehensive study of microorganisms covering aspects of growth, nutrition, transport, autotrophic and heterotrophic metabolism, regulation, and differentiation.

557 Experiments in Microbiology (2:0:6). Prerequisite BIOL 566 or permission of instructor. Students perform a select group of experiments that illustrate techniques used in the study of microbial taxonomy, genetics, physiology, and metabolism.

560 Biological Ultrastructure (4:2:6). Prerequisites BIOL 383, CHEM 313–314, and permission of instructor. Introduction to techniques involved in electron microscopy and to the interpretation of electron micrographs of plants and animals.

561 Comparative Animal Physiology (3:3:0). Prerequisite BIOL 326 or permission of instructor. Detailed study of selected physiological systems of invertebrates and vertebrates, emphasizing current research.

563 Virology (3:3:0). Prerequisites BIOL 383 and 311 or permission of instructor. Fundamental concepts of the nature of viruses, virus classification, cultivation and biochemistry. Bacteriophage and animal viruses emphasized. Fall.

564 Techniques in Virology (2:1:3). Co–or prerequisite BIOL 563 or permission of instructor. Emphasis on propagation of animal viruses in embryoned eggs and cell culture, titration of animal viruses and bacteriophage, serological techniques used in virology and biochemical and biophysical characterization of viruses.

567 (667) Molecular Genetics (3:3:0). Prerequisite BIOL 311 or permission of instructor. Study of molecular structure of genetic material and control of gene expression in viruses, procaryotes, and eucaryotes.

572 Human Genetics (3:3:0). Prerequisite General genetics or permission of instructor. Study of the inheritance of man, emphasizing current problems, including genetic control of metabolic diseases, effects of radiation and chemical agents in the environment, and directed genetic change. Fall, odd-numbered years.
573 Developmental Genetics (3:3:0). 
Prerequisite General genetics or permission of instructor. Study of genetic approaches to the problem of eucaryotic development emphasizing current research on the regulation of gene enzyme systems. Fall, even-numbered years.

574 Population Genetics (3:3:0). Prerequisite General genetics or permission of instructor. Study of the genetic structure and dynamics of populations, both real and ideal. Spring, even-numbered years.

575 Selected Topics in Genetics (3:3:0). Prerequisite General genetics or permission of instructor. Different topics in different years. Topics include molecular, developmental, physiological, and classical genetics emphasizing current problems and research. May be repeated once with permission of chair. Spring, odd-numbered years.

601 Advanced General Biology: Classical Principles and Modern Views I (3:3:0). Prerequisite 24 hours in life sciences or permission of instructor. Intensive review of the fundamental concepts relating to cellular biology and to the structure and function of plants and animals. Available for credit toward M.S. with specialization in interpretive biology only.

602 Advanced General Biology: Classical Principles and Modern Views II (3:3:0). Prerequisite 24 hours in life sciences or permission of instructor. Intensive review of the fundamental concepts relating to genetics, development, evolution, behavior and ecology. Available for credit toward M.S. with specialization in interpretive biology only.

605 Special Skills in the Life Science (1-3:0:0). Prerequisite Baccalaureate degree and 24 hours of biology or permission of instructor. Lectures, lecture-demonstrations, laboratory, workshop, or field experiences in specific methods or techniques. Content varies. May be repeated with permission of chair. A maximum of three courses and six hours may be applied to the M.S. in biology in the interpretive track only.

622 (522) Methods and Principles of Animal Taxonomy (3:1:5). Prerequisite Course in evolution or permission of instructor. Theoretical basis of techniques used in animal classification with emphasis on their practical application to a lab problem dealing with a particular animal group.

624 Coevolution of Plants and Animals (3:3:0). Prerequisite Course in evolution. Topics include the mechanisms of evolution of plant and animal interactions, chemical communication, population dynamics, energetics of ecosystems, and development of the interactions over time.

625 Animal Navigation (3:3:0). Prerequisite Course in animal behavior or statistics or permission of instructor. Exploration of mechanisms by which animals orient and navigate while homing or migrating. Emphasis on vertebrates.

630 Selected Topics in Vertebrate Zoology (3:3:0) or (3:2:3). Prerequisites Courses in vertebrate zoology or comparative anatomy and ecology or permission of instructor. Topic depends on specialty of instructor. May be repeated once.

640 Environmental Biology I (3:3:0). Prerequisite Course in ecology or permission of instructor. Patterns of climate and weather, tectonics, soil formation, and surface and ground water movements. Fall.

641 Environmental Biology II (3:3:0). Prerequisite Course in ecology or permission of instructor. Effects of human activities on environment. Airborne, waterborne and solid "waste" material are considered with respect to sources, control, and effects on the ecosystem. Spring.

643 Microbial Ecology (4:3:3). Prerequisite Courses in microbiology or permission of instructor. Study of relationships between microorganisms and their natural environment, and methodology for observing their natural environment, and biochemical activities in those environments. Spring of odd-numbered years.

645 Freshwater Ecology (4:3:3). Prerequisite Course in ecology. Physical and chemical features of freshwater lakes and streams and relationship to the biota. Local streams and lakes are investigated. Fall.

648 Population Ecology (3:3:0). Prerequisite Course in ecology or permission of instructor. Survey of ecological models and theory. Topics include population growth and regulation, competition, predator-prey relationships and models of community structure. Fall.

649 Biological Resource Management (3:3:0). Prerequisite Course in ecology or permission of instructor. Modern ecological theories and methods applied to biological resource management in developing and developed countries. Problems in achieving optimum productivity of specific resources and application of systems analysis.

650 (747) Environmental Analysis and Modeling (4:3:3). Prerequisite Calculus, course in ecology, programming experience, or permission of instructor. Students learn to conceptualize ecological systems, to represent these conceptualizations mathematically, and to develop and test models against field data. Model applications are emphasized.

665 Environmental Hazards to Human Health (3:3:0). Prerequisite Course in animal physiology or permission of instructor. Health effects of chemical contaminants of air, water, and food resulting from industrialized society. Includes identifying, evaluating, and controlling hazards.

668 Advanced Techniques in Molecular Biology (4:2:6). Prerequisites BIOL 383, 311; CHEM 313-314, 563-564; or permission of instructor; BIOL 361 recommended. Experimental studies utilizing current methods for purification and characterization of biologically important compounds; designed to provide training for research in molecular biology.
669 Pathogenic Microbiology (3:3:0).
Prerequisites Courses in microbiology and in biochemistry. Molecular mechanisms of exotoxins, endotoxins, and viral pathogenicity and the immune response in infectious diseases.

670 Environmental Law for Biologists (3:3:0).
Prerequisite Course in ecology or environmental biology or permission of instructor. Study of environmental laws such as the National Environmental Policy Act and regulatory issues such as the Clean Water and Clean Air acts. Emphasis on critical evaluation of alternatives to unresolved issues in environmental policies.

680 Experimental Design and Analysis for the Life Sciences (4:3:3).
Prerequisite Course in bio-statistics or permission of instructor. Advanced course in application of probability and statistics to research in the life sciences. Examples drawn from environmental, medical, physiological, genetic, and chemical biology. Spring.

690 Introduction to Graduate Studies in Biology (1:1:0). Required of all new M.S. students in Biology. Fall.

691 Current Topics in Biology (1:1:0). May be repeated for credit.

692 Seminar in Environmental Biology (1:1:0). Topics vary. May be repeated for credit.

693, 694 Directed Studies in Biology (1-8:0:0).
Prerequisites Permission of instructor, chair, and student’s graduate committee. Topic study not otherwise available in graduate program. May involve any combination of reading assignments, tutorials, lectures, papers, presentations, or lab or field study, determined in consultation with instructor. May not be used to fulfill explicit undergraduate prerequisite for graduate work.

695 Seminar in Molecular, Microbial, and Cellular Biology (1:1:0). Review and discussion of recent literature in a specialized area. Includes student presentations. May be repeated for credit.

741 Advanced Topics in Environmental Biology (3:3:0) or (3:2:3). Prerequisite 8 hours of ecology or permission of instructor. Topics vary. May be repeated only with permission of chair.

745 Environmental Toxicology (3:3:0).
Prerequisite Courses in ecology and physiology or permission of instructor. 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.

793 Research in Biology (1-3:0:0). Prerequisites 8 graduate hours in BIOL and permission of instructor and chair. Library, lab, or field investigation under supervisor’s guidance. May be repeated for a total of three hours.

799 Thesis (3-6:0:0). Prerequisite 8 hours of graduate credit in BIOL and permission of instructor and chair. Thesis research under direction of supervisor. Students who take BIOL 793 may receive no more than a total of six credits for both BIOL 793 and BIOL 799.

800 Studies for the Doctor of Arts in Education (variable credit). Prerequisite D.A.Ed. student admission to study in biology. Program of studies designed by the student’s discipline director and approved by student’s doctoral committee which brings the student to participate in research of discipline director and results in a paper reporting the original contributions of the student. The paper is presented in a subsequent D.A.Ed. summer seminar. Enrollment may be repeated.

894 Supervised Internship (3-12:0:0).
Prerequisites Permission of chair and of student’s doctoral committee. Training in application of ecological skills to environmental management and policy under supervision of a qualified environmental scientist at a governmental agency, consulting firm, industry or other acceptable organization.

991 Advanced Seminar in Environmental Biology (2:2:0). Prerequisite 8 hours of ecology or permission of instructor. Topics generally address the interface between environmental biology and public policy, but some address more basic environmental biology. May be repeated. Required of all Ph.D. students.

999 Doctoral Dissertation Research (3-12:3:0).
Prerequisite Approval of dissertation proposal. Research dealing with a basic or applied problem in environmental biology.
Business Administration

Faculty

Bolce, William J., Ph.D., The American University, 1974; Visiting Assistant Professor, Management

Bradwick, Faye L., J.D., Syracuse University, 1984; CPA, Assistant Professor

Buchanan, Phillip G., Ph.D., Temple University, 1982; Assistant Professor, Accounting

Cao, Le Thl, D.B.A., University of Southern California, 1975; Associate Professor, Accounting

Carlson, Christopher, D.P.A., University of Southern California, 1985; Assistant Professor, Decision Sciences

Coffinberger, Richard L., J.D., Wake Forest University, 1974; Associate Professor, Business Legal Studies

Cohen, Debra J., Ph.D., Ohio State University, 1987; Assistant Professor, Management

Crawford, Peggy J., Ph.D., Purdue University, 1979; Assistant Professor, Finance

Crockett, John H., Ph.D., University of North Carolina, Chapel Hill, 1975; Associate Professor, Finance

Das, Sidhartha R., Ph.D., University of Houston, 1985; Assistant Professor, Decision Sciences

DeBoer, Lloyd M., Ph.D., University of Illinois, Urbana-Champaign, 1957; Professor, Marketing

Domzal, Teresa, Ph.D., University of Cincinnati, 1981; Associate Professor, Marketing

English, Jon, Ph.D., University of Florida, 1972; Professor, Management

Entrikin, Richard, Ph.D., St. Louis University, 1976; Associate Professor, Marketing

Erdener, Carolyn B., M.B.A., Indiana University, 1986; Acting Assistant Professor, Management

Fagenson, Ellen A., Ph.D., Princeton University, 1981; Assistant Professor, Management

Ferri, Michael G., Ph.D., University of North Carolina, 1975; Professor, Finance

Gardner, Ella P., D.B.A., George Washington University 1982; Assistant Professor, Decision Sciences

Gulledge, Thomas R., Jr., Ph.D., Clemson University, 1981; Associate Professor, Decision Sciences

Hanweck, Gerald A., Ph.D., Washington University, 1971; Associate Professor, Finance

Hartman, Freda A., Ph.D., North Texas State University, 1982; Visiting Associate Professor, Management

Harvey, James, Ph.D., Pennsylvania State University, 1977; Assistant Professor, Marketing

Heller, Kenneth H., Ph.D., University of Texas at Austin, 1977; CPA, Professor, Accounting

Hogan, Eileen A., Ph.D., University of California at Berkeley, 1983; Assistant Professor, Management

Hysom, John L., Ph.D., The American University, 1973; Associate Professor, Finance

Johnston, Robert D., Ph.D., University of Alabama, 1974; Associate Professor, Finance

Kendall, Julie E., Ph.D., University of Nebraska, Lincoln, 1984; Assistant Professor, Decision Sciences

Kendall, Kenneth E., Ph.D., State University of New York at Buffalo, 1974; Professor, Decision Sciences

Kernan, Jerome B., Ph.D., University of Illinois, 1962; Professor, Marketing

Kovach, Kenneth A., D.B.A., University of Maryland, 1975; Professor, Management

Lynn, Susan A., D.B.A., University of Maryland, 1982; Assistant Professor, Accounting

McCrohan, Kevin F., Ph.D., City University of New York, 1978; Professor, Marketing

Millispaugh, Peter E., J.D., The American University, 1968; Associate Professor, Business Legal Studies

Patrick, Steven L., Ph.D., University of Georgia, 1987; Assistant Professor, Management

Pearce, John A., II, Ph.D., Pennsylvania State University, 1976; Professor, Management

Pugh, Robert E., Ph.D., American University, 1975; Assistant Professor, Decision Sciences

Render, Barry, Ph.D., University of Cincinnati, 1975; Professor, Decision Sciences

Reuben, Lucy J., Ph.D., University of Michigan, 1981; Commonwealth Visiting Associate Professor, Finance

Ruth, Stephen R., Ph.D., University of Pennsylvania, 1970; Professor, Decision Sciences

Samuels, Linda B., J.D., University of Virginia, 1975; Associate Professor, Business Legal Studies

Sands, Ben F., Jr., D.B.A., The George Washington University, 1975; Emeritus Associate Professor, Management


Sugrue, Timothy F., Ph.D., University of Massachusetts, 1985; Assistant Professor, Finance

Tongren, Hale N., D.B.A., The George Washington University, 1968; Professor, Marketing
54 Areas of Study

Tucker, Michael J., Ph.D., University of Houston, 1980; J.D., New York University, 1974; Associate Professor, Accounting

Wardlow, Penelope J., Ph.D., University of Georgia, 1985; Assistant Professor, Accounting

Warkentin, Merrill E., Ph.D., University of Nebraska, Lincoln, 1986; Assistant Professor, Decision Sciences

Wongtada, Nittaya, Ph.D., University of Tennessee, 1986; Assistant Professor, Marketing

Young, Margaret, Ph.D., Pennsylvania State University, 1985; Assistant Professor, Decision Sciences

Zahra, Shaker A., Ph.D., University of Mississippi, 1982; Associate Professor, Management

Business Administration, M.B.A.

The Master of Business Administration degree, offered by the School of Business Administration, is designed to provide a high level of professional education in several functional areas of business administration. The program is oriented to management in both business and government. The program is available in the daytime for full-time students only and in the evening for full- or part-time students.

Admission Requirements

All students registering for graduate-level courses numbered 600 or higher offered by the School of Business Administration must have graduate standing (i.e., be admitted to the Graduate School).

Degree applicants must fulfill the general admissions requirements of the Graduate School.

Admission to the M.B.A. degree program is competitive. The admissions decision is based primarily on grades in undergraduate academic coursework, and on performance on the GMAT. These criteria are applied flexibly to assure that people with unusual academic qualifications are not denied admission.

Degree Requirements

The M.B.A. program involves between 36 and 60 semester hours of graduate course work. The exact number of credit hours for an individual's program is based on an evaluation by the associate dean at the time of admission. The decision is based on the applicant's prior academic background, with particular emphasis on knowledge acquired in the foundation course work described below. The structure of the program is based on three levels of course work: foundation courses (0-24 hours); M.B.A. core courses (18 hours); and elective courses (18 hours). A student may elect a thesis option to substitute for six hours of course work with written approval of the associate dean, School of Business Administration.

Day Program

The day M.B.A. is a structured program for students who have completed all foundation course work and who wish to pursue their M.B.A. degree full time during the day. The day program provides an academically rigorous yet cost-efficient option for earning the M.B.A. degree. The day M.B.A. courses are staffed exclusively by full-time faculty members who have earned the appropriate doctoral degree.

All students must take the same courses at the same time over the three semesters of the program. Students who start the M.B.A. program during the day may transfer to the evening program, but students in the evening program may not normally transfer to the day program. Students who withdraw from the day program or otherwise fail to complete the expected sequence with their entering class must complete their studies in the evening program.

The day program mirrors the content of the evening program but offers less scheduling flexibility. The program of study for the day program is spread over eleven months as follows:

Fall 1988 schedule: ACCT 611, MKTG 611, DESC 611, MKTG 611
Spring 1989 schedule: FNAN 611, MKTG 797, and three electives
Summer 1989 schedule: three electives

Students will only be accepted to the day program for the fall term.

Evening Program

The evening program is available to both full-time and part-time students, although it is oriented toward the needs of part-time students. Students who have not completed all foundation course work must begin their studies in the evening program and may apply to transfer to the next class of the day program upon completion of all foundation deficiencies. Otherwise, evening program students may not transfer to the day program although the reverse is permissible.

Foundation Course Work (24 Hours)

Each graduate student must complete the course work identified in the foundation courses listed below, unless the material offered in the courses has been successfully completed prior to admission. Normally an undergraduate degree in business administration will satisfy most of the foundation course work requirements. Foundation courses may not be used for M.B.A. elective credit.

The foundation courses are:

ACCT 610 Accounting and Reporting (3)
FNAN 610 Financial Management (3)
MKTG 610 Marketing Concepts and Processes (3)
IRM 610 Computer Systems for Management (3)
DESC 610 Statistical Foundation for Business Decision Making (3)
BULE 610 Law and the Business Environment (3)
MKTG 612 Organizational Behavior (3)
FNAN 602 Managerial Economics (3)
M.B.A. Core (18 Hours)

Each candidate must complete the following M.B.A. core courses unless, in the opinion of the School of Business Administration faculty, the candidate has had previous comparable graduate-level course work which would justify substitution of a 700-level course in that discipline.

ACCT 611 Managerial Accounting (3)
FNAN 611 Cases in Financial Administration (3)
MKTG 611 Cases in Managerial Marketing (3)
DESC 611 Quantitative Analysis in Business and Operations Management (3)
MGMT 613 Management Theory and Practice (3)
MGMT 797 Business Policy (3)

(See note on thesis option)

Electives (18 hours)

Each candidate must complete at least 18 hours of M.B.A. electives with no more than three 700-level graduate courses (including 700-level courses transferred as M.B.A. electives) in one of the following disciplines: Accounting, Business Legal Studies, Decision Sciences, Finance, Information Resource Management, Management, or Marketing.

Thesis Option

On completion of 30 hours of M.B.A. core and elective courses, the student may elect to fulfill the requirement for two elective courses by completing a thesis.

Special School Regulations

1. No more than 12 hours of M.B.A. foundation or core credits may have been earned through enrollment in nondegree status or through extended studies enrollment prior to acceptance in degree status. A grade of B or better is necessary to transfer foundation or core requirements taken through extended studies.

2. A maximum of six semester hours of graduate credit in approved 500-level graduate courses may be authorized; however, these courses must have prior written approval of the associate dean, School of Business Administration.

3. A maximum of six hours of elective credits in another graduate program of this University may be allowed provided they are in a related field and have prior written approval of the associate dean, School of Business Administration.

4. Subject to general transfer policies of the Graduate School, up to six hours of graduate course work may be transferred from other institutions. However, to be considered for transfer, such work must have been completed within six years prior to the date of admission to the Graduate School.

5. In all cases, students must complete a minimum of 24 hours of graduate course work at the University while in degree status.

6. Required foundation courses must be completed before a student begins core courses. Core courses should be completed before electives are taken.

7. No credit is granted for work done in absentia.

Accounting (ACCT). Graduate courses in Accounting are listed in the catalog under the heading of M.S. in Accounting.

The graduate certificate program in Information Resource Management is listed under the heading of Certificate Programs.

Business Legal Studies Courses (BULE)

Warning: Students who have not gained admitted status from the Graduate School may not register for graduate-level courses numbered 600 or higher offered by the School of Business Administration.

610 Law and the Business Environment (3:3:0). Prerequisite Graduate standing, interrelationships between business organizations, their external environments, issues arising out of those environments, and the public policy process.

702 Business and the Regulatory Process (3:3:0). Prerequisite BULE 610 or equivalent. Regulatory process as it affects business; emphasis on interaction of legislative, administrative, and judicial policies and procedures as they influence the formulation and interpretation of regulations.

703 Land Use Control and Regulation (3:3:0). Prerequisites REUD 301 or permission of instructor and BULE 610. Basic principles of law affecting the use of land and natural resources including legal remedies and defenses available to the private citizen. Emphasis on recent laws and federal and state statutes.

770 Legal Aspects of Information Resource Management (3:3:0). Prerequisite IRM 610 or permission of instructor. Examination of the special problems of applying existing laws and legal doctrines to the management of information resources. Emphasis on how the public policy process responds to the unique problems posed by information processing technology as well as how managers can influence public policy. Readings, case analysis, lecture, reports (same as IRM 770).

Decision Sciences Courses (DESC)

Warning: Students who have not gained admitted status from the Graduate School may not register for graduate-level courses numbered 600 or higher offered by the School of Business Administration.

610 Statistical Foundation for Business Decision Making (3:3:0). Prerequisites 5 credits of math with calculus strongly recommended and graduate standing. The use of statistical methods as scientific tools in the analysis of practical problems in business decision making. Topics include descriptive statistics; probability theory; probability distribution; sampling distribution, inference-estimation and hypothesis testing; elementary decision theory; time series analysis; linear regression and correlation; the analysis of variance.

http://catalog.gmu.edu
611 Quantitative Analysis in Business and Operations Management (3:3:0). Prerequisites DESC 610 and graduate standing; knowledge of calculus strongly recommended. A systems approach which addresses a wide range of operations management decisions from long-term policy and systems design questions to daily scheduling, cost control, and quality control decisions. Emphasis is on modeling, quantitative analysis of systems, case studies, and using computer programs to solve operations management problems.

735 Computer Simulation (3:3:0). Prerequisites IRM 610 and DESC 611. Introduction to the basic concepts of simulating complex systems by computer. Topics include Monte Carlo methods, discrete-event modeling, a specialized simulation language, and the statistics of input and output analysis.

742 Management Science (3:3:0). Prerequisite DESC 611. Operations research techniques for systems analysis. Addresses prominent mathematical programming and stochastic process topics from linear programming, networks, integer programming, goal programming, decision theory, dynamic programming, Markov processes, inventory theory, and queuing theory. Use of computer software in problem solving and in case study analyses.

743 Seminar in Applications of Management Science (3:3:0). Prerequisite DESC 742. Model development and implementation involved in the practice of operations research in management science.

744 Contemporary Issues in Decision Analysis (3:3:0). Prerequisite DESC 611. Application of analytic reasoning skills to practical problems in business administration. Topics include problem structure, analysis, and solution implementation, emphasizing contemporary approaches to decision analytic techniques.

753 Seminar in Operations Management (3:3:0). Prerequisite DESC 611. Aspects of productivity, technology, new processes, materials, products, equipment, and facilities. Implications of new technology in managing the operation (production) function. Lecture, discussion, cases, and problems.

796 Independent Study and Directed Readings (3:0:0). Prerequisites Foundation and core courses. By special arrangement with professor and approval of the Decision Sciences Chair.

799 Thesis (6:0:0). Prerequisite 30 hours of graduate course work beyond the foundation.

Finance Courses (FNAN)

Warning: Students who have not gained admitted status from the Graduate School may not register for graduate-level courses numbered 600 or higher offered by the School of Business Administration.

602 Managerial Economics (3:3:0). Prerequisites DESC 610 and graduate standing. Provides a fundamental understanding of how economic principles are applied, along with mathematical and statistical analysis, to managerial decision making. Principles of microeconomic theory are thoroughly explored including models of theories of choice under conditions of risk, uncertainty and multiple goals, market supply and demand, production and cost functions, monopoly, oligopoly and perfect competition, product and resource pricing, capital budgeting and investment and general equilibrium.

610 Financial Management (3:3:0). Prerequisites FNAN 602, ACCT 610, DESC 610, and graduate standing. Topics include management of working capital, determination of the cost of capital and optimal financial structure, capital budgeting processes, and the overall integration of financial management to achieve a maximization of wealth–decision criteria.

611 Cases in Financial Administration (3:3:0). Prerequisites ACCT 611, FNAN 610 and graduate standing. Applying the theories of finance to the formulation and application of policies. Internal financial analysis, financial forecasting, management of assets, rate-of-return, capital formation cases, financial management in the multinational environment.

711 Long-Term Financial Management (3:3:0). Prerequisite FNAN 611. Analysis of capital budgeting and long-term asset financing. Capital budgeting and financing techniques for the fixed asset portion of balance sheet are considered.

721 Security Analysis (3:3:0). Prerequisite FNAN 611. The analysis of equity securities and debt instruments given the implications of the efficient market hypothesis and modern capital market theory.

722 Portfolio Analysis (3:3:0). Prerequisite FNAN 611. Theory and mathematical techniques used in the management of investment portfolios.

731 Financial Markets (3:3:0). Prerequisite FNAN 611. Allocation of funds process accomplished by financial markets. Money and capital markets, including the organization, relative efficiency and interaction between market segments.

732 Financial Institutions (3:3:0). Prerequisite FNAN 611. Financial institutions as intermediaries within the financial markets. Organizational and regulatory forces in terms of influences upon management.

741 Current Topics in Finance (3:3:0). Prerequisite FNAN 611. Topics of interest in finance, including industrial, governmental, international, or institutional applications. Techniques and methods of financial practice and influences of new legislation.

751 Real Estate Finance: Mortgage Markets and Investment (3:3:0). Prerequisite FNAN 611. Mortgage banking with emphasis on markets, instruments, and financial environment and techniques; and the real estate investment decision–making process and skills with emphasis on analysis and strategy. Microcomputer applications.

752 Real Estate Market Analysis (3:3:0). Prerequisite FNAN 610. Real estate market

http://catalog.gmu.edu
analysis and sources of data: problems and techniques that apply to each of the analysis of various types of real estate. Students will develop analytical skills involving the use of the microcomputer and appropriate software.

753 Land Development (3:3:0). Prerequisite FNAN 610. The business of creating new communities of residential, commercial, and industrial space; includes land acquisition, overall planning, project management, financing, land preparation, and construction. Techniques involve site selection, location analysis, market feasibility studies, and legal and social analysis. Microcomputer applications.


796 Independent Study and Directed Readings (3:0:0). Prerequisites Foundation and core courses. By special arrangement with professor and approval of the Finance Department Chair.

799 Thesis (6:0:0). Prerequisite 30 hours of graduate course work beyond the foundation.

Information Resource Management Courses (IRM)

Warning: Students who have not gained admitted status from the Graduate School may not register for graduate-level courses numbered 600 or higher offered by the School of Business Administration.

610 Computer Systems for Management (3:3:0). Prerequisite Graduate standing and a course in computer programming recommended. Examination of computer information systems and their interrelations with management processes. Emphasis on management information system life cycle from manager's perspective. Lecture and computing lab, including programming in BASIC and a variety of microcomputer software packages.

720 Analysis and Design of Computer Systems (3:3:0). Prerequisite IRM 610. Computer systems life cycle with emphasis on information requirement analysis, feasibility studies, system design, equipment selection, and the implementation process. Student teams are assigned system development projects to work with users to define system requirements and to prepare implementation plans.

730 Decision Support and Expert Systems (3:3:0). Prerequisite IRM 610. Use of decision support systems and expert systems in large organizations' data bases. Course concentrates on technical and administrative issues facing companies and agencies which need to go beyond MIS to meet more complex information needs. Introduces user and manager perspectives. Introduces micro-based and mainframe-based DSS and Expert Systems packages. Project and computer lab.

735 Management Information Systems (3:3:0). Prerequisite IRM 610. Conceptual foundations, structure, and development of management information systems from an organizational perspective are featured. Information-based support systems for the management of knowledge work are also covered. Term project.

740 Distributed Systems Applications (3:3:0). Prerequisite IRM 610. Technical and managerial issues in the planning, installation, support, use, and operation of business data communication systems. Term project and laboratory.

750 Managerial Applications of Micro-computers (3:3:0). Prerequisite IRM 610. Selection and use of microcomputer hardware and software for management applications such as word processing, spread sheet analysis, graphics, communications, file management, and data base management. Term project and laboratory.

760 Human Engineering Issues in Computer Systems Design (3:3:0). Prerequisite IRM 610. Surveys the various human factors and ergonomic aspects of computer systems, including hardware and information displays as well as human factors principles of software design. Return on investment on alternative human factors decisions examined in applied settings. Cases and laboratory.

770 Legal Aspects of Information Resource Management (3:3:0). Prerequisite IRM 610 or permission of instructor. Examination of the special problems of applying existing laws and legal doctrines to the management of information resources. Emphasis on how the public policy process responds to the unique problems posed by information processing technology, as well as how managers can influence public policy. Readings, case analysis, lecture, reports. (Same as BULE 770).

780 Knowledge-Based Systems for Business (3:3:0). Prerequisites IRM 610, 720. Introduction for system developers and managers to the concepts and techniques for building knowledge-based systems. Emphasis is on the use and application of knowledge-based systems in business and public section organizations. Term project.

790 Contemporary Issues in Information Resource Management (3:3:0). Prerequisite IRM 610. Introduction to the concepts, techniques, and implementation of information resource management in businesses, government agencies (federal, state, local), and other organizations. Emphasis is on the use of contemporary techniques in IRM applied to the full spectrum of information resource issues, including equipment, systems, hardware, software, training, data communications, and human factors. Term project.

792 Topics in Information Resource Management (3:3:0). Prerequisite IRM 610. A significant information resource management topic is selected for detailed coverage. Examples of such topics are computer security, life cycle management of EDP systems, computer personnel management. Term Project.
Management Courses (MGMT)

Warning: Students who have not gained admitted status from the Graduate School may not register for graduate-level courses numbered 600 or higher offered by the School of Business Administration.

712 Organizational Behavior (3:3:0). Prerequisite Graduate standing. Study and application of principles of individual and group behavior to the solution of human problems in business organizations, domestic and international. Relationships with superiors and subordinates in formulating and accomplishing personnel policies.


597 Organizational Policy and Strategic Management (3:3:0). Prerequisite 21 hours beyond the foundation course work. This course is not open to M.B.A. students. An examination of the role of top management in organizations. The major areas of study focus on the integration of the functions and activities of organizations to ensure effective dealing with changing environments. A strong emphasis is placed on the applications as well as the theoretical basis of policy formulation, implementation, and evaluation. Readings, case analyses, management simulation, seminar reports, and discussions.


722 Human Resource Planning (3:3:0). Prerequisite MGMT 613. This course examines the personnel/human resource process which provides adequate human resources to achieve future organizational objectives. Emphasis on forecasting internal labor supply and demand; programming to meet objectives; and evaluation and control. Readings, research, discussion, and lecture.

731 Seminar in Labor Management Relations (3:3:0). Prerequisite MGMT 613. The U.S. labor movement and its present political-economic status. Legal environment surrounding labor relations and recent rulings by regulatory bodies. Executive orders and political forces influencing unions in the public sector. Emphasis on negotiations and administration of labor contracts at the local level.

741 Strategic Planning and Control (3:3:0). Prerequisite MGMT 613. Theories and applications of modern strategic planning. Strategic decision making within the supportive framework of a strategic planning system. Emphasizes the methodological "how to do it" aspects of strategic decision making, planning, and control. Lecture, readings, discussion, case analysis, and projects.


761 Management of Research and Development (3:3:0). Prerequisites MGMT 613 and FNAN 602 or permission of department. Study of management concepts in R & D, including examination of selected international practices (e.g., Japan, West Germany, etc.) and possible adaptation, recognizing cultural differences. Emphasis on the incentives and disincentives for R & D climate and the organizational and management techniques which affect R & D performance. Economics affecting R & D programs, role of government and universities in industrial R & D activities.

771 Organizational Management and Public Policy (3:3:0). Prerequisites BULE 610 and MGMT 613. An examination of contemporary organizational management reflecting economic, social, political, and technological public policy concerns. Management issues treated include disclosure, governance, ethical behavior, employee citizenship rights, working life, governmental relations and political involvement, health, safety, and the environment.

781 Seminar in Comparative Business Management (3:3:0). Prerequisite MGMT 613. Comparative analysis of business practices and management systems in different economic, social, and political systems. Generic characteristics of management and business enterprises as modified in varying environments.

785 Business and Organizational Interviewing (3:3:0). Prerequisite MGMT 613 or permission of instructor. Study of management theory and concepts relevant to business and organizational interviewing. Introduction to relevant theory and research on the most commonly used forms of the business interview. Videotaping and role playing train students in the correct uses of the business interview. Focus on survey, selection, appraisal, counseling, discipline, and exit interviews from the perspective of the interviewer.

795 Managerial and Business Communication (3:3:0). Prerequisite MGMT 613 or permission of instructor. Study of the concepts and issues in managerial and business communication. Introduction to the study of managerial communication as preparation for a career in human resource development. The study of managerial communication is a natural base for work in the general personnel function of an organization.

796 Independent Study and Directed Readings (3:0:0). Prerequisite Foundation and core courses. By special arrangement with professor and approval of the Management Department Chair.

797 Business Policy (3:3:0). Prerequisite 24 graduate semester hours beyond foundation course work including completion of all 611 courses and MGMT 613. Examines entrepreneurial functions in business: determination of the field of business in which the firm will operate, its goals, corporate strategy to reach these goals, and major policies to implement the corporate strategy.

798 Seminar in Business Research (3:3:0). Prerequisite 30 graduate semester hours beyond foundation course work. Study of research design plans, methodologies, data collection and analyses and their application to business research projects. Students prepare a written report covering an approved research topic in a specialty area.

799 Thesis (6:0:0). Prerequisite 30 hours of graduate course work beyond the foundation.

Marketing Courses (MKTG)

Warning: Students who have not gained admitted status from the Graduate School may not register for graduate-level courses numbered 600 or higher offered by the School of Business Administration.

610 Marketing Concepts and Processes (3:3:0). Prerequisites FNAN 602, ACCT 610, and graduate standing. Decision making in the marketing areas of product development, pricing, promotion, and physical distribution. Emphasis on analysis of marketing situations and on data-based decision making.

611 Cases in Managerial Marketing (3:3:0). Prerequisite MKTG 610 and graduate standing. The application of qualitative and quantitative techniques in approaching various marketing situations. Emphasis on use of marketing research, product planning, pricing, and target market determination.

724 Promotional Strategy in Marketing (3:3:0). Prerequisite MKTG 611. Promotion activities as applied to both profit and nonprofit organizations. The approach is to develop basic issues in promotional strategy, then to focus on managerial issues and problems as encountered by promotion executives.
Chemistry

Faculty

Chen, Holly Ho, Ph.D., University of California at San Diego, 1969; Associate Professor
Cozzens, Robert F., Ph.D., University of Virginia, 1966; Professor
Davies, Keith M., Ph.D., University of Wales, 1967; Associate Professor
Davis, Stephen L., Ph.D., Yale University, 1976; Associate Professor
Gupton, John T., III, Ph.D., Georgia Institute of Technology, 1975; Professor
Hussam, Abul, Ph.D., University of Pittsburgh, 1982; Assistant Professor
Johnson, Edward D., Ph.D., Northwestern University, 1977; Assistant Professor
Meites, Louis, Ph.D., Harvard University, 1947; Professor, Department Chair
Mushrush, George W., Ph.D., George Washington University, 1968, Professor, Associate Chair
Roth, Ronald J., Ph.D., Columbia University, 1972; Associate Professor
Slayden, Suzanne W., Ph.D., University of Tennessee, 1976; Associate Professor
Stallck, Wayne M., Ph.D., Northwestern University, 1969; Professor
Weber, Jon P., Ph.D., University of California at Santa Cruz, 1980; Assistant Professor

Chemistry, M.S.

The Master of Science program in Chemistry provides advanced training for recent college graduates, professionals in teaching, and technical workers in research organizations with interests in chemistry.

Admission Requirements

To be considered for admission to degree status, a student must have a bachelor’s degree in chemistry or a related field from an accredited institution and must meet the general admission requirements of the Graduate School.

Admission is based on a departmental evaluation of the applicant’s background as evidenced by transcripts and letters of recommendation. A resume must be submitted by each applicant who received the bachelor’s degree more than five years before the date of application. Acceptable scores on the Graduate Record General and Subject Chemistry Examinations must also be submitted unless this requirement is waived on the basis of the applicant’s record and experience.

Each entering student may be required to take proficiency examinations before registering for the first time. The results of these examinations are used in planning the program of study. A student whose performance on these examinations reveals serious deficiencies may be required to register for one or more remedial undergraduate courses, which may not be used to satisfy the requirements for the M.S. degree. Each student must present evidence of computer literacy before completing 12 credit hours of graduate work.

Degree Requirements

Two tracks are available. The laboratory track is for students planning to continue work for the Ph.D. degree or to begin or continue careers in chemical research. The thesis written by a student on this track may be based on either experimental or theoretical research. The non-laboratory track is for those seeking to go on to professional schools, to teach chemistry in secondary schools, or to pursue other careers in which advanced work in chemistry is necessary or advantageous but which do not involve laboratory work.

A student must complete at least 30 credit hours of graduate course work. Of these, 12 must be in core courses in chemistry (one in each of four different areas chosen from analytical, biological, inorganic, organic, and physical chemistry). 3 must be in an elective course in chemistry, 6 must be in elective courses in chemistry or related fields, 3 must be in CHEM 690 (Graduate Seminar in Chemistry), and 6 must be in either CHEM 798 (for a student on the non-laboratory track) or CHEM 799 (for a student on the laboratory track). Courses acceptable toward the core-course requirement are identified in the following list of courses.

A final oral examination is required on each track. Each student on the laboratory track will present a thesis on an experimental or theoretical research project and take a final examination given by a thesis committee. Each student on the non-laboratory track will present a written report on a non-laboratory research project and take a final examination given by an advisory committee. The student’s thesis or advisory committee is appointed during the first semester of registration in CHEM 798 or 799.

Chemistry Courses (CHEM)

500 Selected Topics in Modern Chemistry (3:3:0). Topics of interest in analytical, biological, inorganic, organic, and physical chemistry. Recommended for teachers of chemistry and general science.

501 Laboratory Demonstration Techniques in the Teaching of Chemistry (3:3:0). Course develops proficiency in conducting lab demonstrations. Recommended for teachers of chemistry and general science.

513 Synthetic and Mechanistic Organic Chemistry (3:3:0). Prerequisites CHEM 313 and 314. Emphasis on topics such as heterocyclics, natural products, and biologically active...
compounds. Relation of applied organic chemistry to consumer products, including drugs and agricultural chemicals. Satisfies the core-course requirement in organic chemistry, or may be taken as an elective course if CHEM 514 is used to satisfy the core-course requirement in that field.

514 Physical Organic Chemistry (3:3:0). Prerequisites CHEM 313, 314, or permission of instructor, but not 513. The principles underlying molecular structures, reactivities, and reaction mechanisms. Topics include valence-bond and molecular-orbital theory, the electronic interpretation of organic reactions, stereochemistry, conformational analysis, the kinetics and thermodynamics of organic reactions, and photochemistry. Satisfies the core-course requirement in organic chemistry, or may be taken as an elective course if CHEM 513 is used to satisfy the core-course requirement in that field.

521 Theory of Analytical Processes (3:3:0). Prerequisite CHEM 422 or permission of instructor. Physicochemical principles and analytical techniques applicable to the analysis of solutions, including activity coefficients, solvation and ionic size, titration-curve theory, acidity functions and pH-scales, kinetic analysis, and modern techniques for designing experiments and interpreting data. Satisfies the core-course requirement in analytical chemistry.

523 Trace and Microanalysis (3:3:0). Prerequisite CHEM 422 or permission of instructor. Principles and applications of currently used methods of analysis, including differential pulse polarography, stripping voltammetry, atomic absorption and emission spectrometry, fluorescence analysis, neutron activation analysis, and spark-source mass spectrometry. Applications to the determinations of traces of metals in environmental samples.

525 Electroanalytical Chemistry (3:3:0). Prerequisite CHEM 422 or permission of instructor. Theory of polarography, stationary-electrode and hydrodynamic voltammetry, chronopotentiometry, controlled-potential electrolysis and coulometry at controlled potential, coulometric titration, and a number of related techniques, with emphasis on their use in analysis and research.

533 Chemical Thermodynamics and Kinetics (3:3:0). Prerequisites CHEM 331 and 332. Advanced study of thermodynamics and kinetics. Satisfies the core-course requirement in physical chemistry.


546 Bioinorganic Chemistry (3:3:0). Survey of the structures, functions, and properties of metal ions in biological systems. Modern inorganic coordination chemistry and the study of metal-ion sites in metalloenzymes and metalloproteins. Enzymatic catalysis, oxygen carriers, electron-transport phenomena, and inorganic model systems. Satisfies the core-course requirement in inorganic chemistry.

563, 564 Biochemistry (3:3:0). Prerequisites CHEM 313 and 314. CHEM 563 is prerequisite to CHEM 564. A previous course in biology is recommended but not required. Important biological compounds, including proteins, carbohydrates, lipids, and nucleic acids, and their interrelations. CHEM 563 satisfies the core-course requirement in biochemistry.

565, 566 Biochemistry Lab (2:1:3), (2:1:3). Prerequisite or corequisite CHEM 563. CHEM 565 is prerequisite for CHEM 566. Introduction to experimental methods used to study the chemical and physical properties of proteins, carbohydrates, lipids, and nucleic acids. Complements the corresponding lecture courses (CHEM 563 and 564). Designed for those who have had no previous exposure to the specialized techniques used in biochemical research. One hour recitation.

567 Protein Biochemistry (3:3:0). Prerequisites CHEM 563 and 564, or permission of instructor. Topics include the structural, transport, and immunological behaviors of proteins with emphasis on their roles as biological catalysts. Current theories of enzyme catalysis as well as pertinent experimental techniques. Important structural proteins from muscle and connective tissue as well as free and membrane-bound transport proteins.

690 Graduate Seminar (1:1:0). Selected topics from recent chemical theory and applications, designed to inform students about current developments in the chemical sciences. A seminar presentation on the student’s own research or another topic acceptable to the department is required in the student’s last semester. Each graduate student in chemistry must register for this course each semester. Three credits of CHEM 690 are required for the M.S. degree.

798 Research Project (3–6:0:0). Prerequisite Permission of department. An experimental or theoretical research project is chosen and completed under the guidance of a graduate faculty member. A comprehensive report acceptable to the student’s advisory committee and a final oral examination on that report are required. Six credits of either CHEM 798 or 799 are required for the M.S. degree, but credit will not be given for both.

799 Master’s Thesis (3–6:0:0). Prerequisite Permission of department. A laboratory research project is chosen and completed under the guidance of a graduate faculty member. A thesis acceptable to the student’s thesis committee and a final oral defense of that thesis are required. Six credits of either CHEM 798 or 799 are required, but credit will not be given for both.

800 Studies for the Doctor of Arts in Education (variable credit). Prerequisite D.A.Ed. student admission to study in chemistry. Program of studies, designed by student’s discipline director and approved doctoral committee, which allows the student to participate in the current research of the discipline director and results in a paper reporting the original contributions of the student. The paper is presented in a subsequent D.A.Ed. summer seminar. Enrollments are repeated according to each student’s program.
Computer and Electronics Engineering, M.S.

Graduate programs leading to the master of science and doctor of philosophy degrees are available to prepare students for industrial, government, or academic careers. The M.S. degree is offered by the Department of Electrical and Computer Engineering. The Ph.D. degree is offered by the School of Information Technology and Engineering, which includes the Department of Electrical and Computer Engineering.

While firmly committed to high standards of teaching and research excellence in the traditional areas of communications and signal processing, control and robotics, computers, and electronics, the department also recognizes the need to augment and enhance these areas through the use of modern information technology. Graduate students are thus offered a progressive environment with ample opportunities for the type of multidisciplinary research that will be needed to confront the complex realities of the twenty-first century.

The courses in this program are being offered during the evening or late afternoon hours to permit persons who are employed full time to enroll in the program. For those who enter the program on a full-time basis, some financial aid is available in various forms such as assistantships, research grants with a project conducted at the University, work-study, or co-op agreements with local industry. Students may take courses through the Cooperative Graduate Engineering Program, in affiliation with the University of Virginia and Virginia Tech. Appropriate courses may be transferred, with adviser approval, into this GMU degree program. Refer to the section on Certificates, Programs, and Additional Graduate Courses in this catalog.

Admission Requirements

Admissions are strictly competitive. The department's policy is to admit only students who have demonstrated a potential for outstanding performance in their graduate work. To be considered for admission to the master's program, applicants should have the following:

1. An earned baccalaureate in electrical engineering, computer engineering, or a closely related discipline from an accredited program with a reputation for high academic standards.

2. A grade average of B or better during the last 60 hours.

3. Three letters of recommendation, preferably from academic references, or from references in industry or government who are holders of advanced degrees and are familiar with the applicant's professional accomplishments.

4. A detailed statement of career goals and aspirations.

5. For students whose native language is not English, a score of 550 or higher on the Test of
English as a Foreign Language. A minimum score of 600 is required for applicants who wish to be considered for graduate assistantships.

6. Although the Graduate Record Examination (GRE) is not formally required, it is strongly recommended, particularly for international students. Test results will be used as an additional measurement of the applicant's qualifications.

Admission Categories. Students may be admitted into one of the following categories: degree, provisional, or nondegree. Provisional admission is for students whose past performance provides reasonable, but not strong, evidence of their capacity to pursue graduate work. To be advanced to degree status, provisional students must achieve a 3.0 grade-point average after 12 semester hours, must remove all undergraduate deficiencies (by taking the corresponding courses with a B or better), and must receive a grade of B or better in each of the graduate core courses ECE 521, 528, 546, and 571. Nondegree students who wish to enter the degree program need to formally apply for admission.

Non-ECE Students. Outstanding students with B.S. or M.S. degrees in ECE-related disciplines (for example, computer science, mathematics, mechanical engineering, physics) are encouraged to apply for admission. As a general guideline, students who do not have adequate preparation in some of the ECE undergraduate core areas are required to complete the corresponding course(s) from the following list with a B average or better:

- Circuit Theory ECE 285, 286
- Digital Electronics ECE 331, 332
- Linear Electronics ECE 333, 334
- Signals and Systems ECE 360
- Matrix Algebra MATH 303
- Differential Equations MATH 304
- Probability MATH 351
- Pascal and Data Structures CS 211

In addition to the above core areas, students must display some competence in two or more of the following areas: communications, controls, computers, and semiconductors, before being granted the master's degree. The following undergraduate courses correspond to these areas:

- Control Theory ECE 421
- Device Theory ECE 430
- Computer Architecture ECE 445
- Communications ECE 460

Transfer of Credit. Up to twelve hours, the maximum permitted by the Graduate School, may be transferred from the University of Virginia or Virginia Polytechnic Institute and State University as part of the Northern Virginia Cooperative Graduate Engineering Program.

Student Advising

Newly admitted graduate students need to consult with the ECE graduate coordinator before they can register for classes. Students should make an appointment by calling (703) 323-2892. Each student will be expected to select a major area of concentration from the department's four specialty areas: communications and signal processing, computer engineering, control and robotics, or electronics. The student will then be assigned an academic adviser from that area. Before the end of the first semester, each student must submit a plan of study (approved by his or her academic adviser) to the graduate coordinator's office.

Degree Requirements

Course Work. Each student must complete a minimum of 30 semester hours of graduate-level courses beyond the bachelor's degree. A minimum grade-point average of 3.0 is required. Additional constraints include the following:

1. A minimum of two core courses (with B or better in each) from the following list:
   - ECE 521 Modern Systems Theory
   - ECE 528 Random Processes in ECE
   - ECE 546 Parallel Computer Architectures
   - ECE 571 Network Analysis
2. A minimum of two courses above the 500 level.
3. A minimum of three courses outside the student's major area.
4. A maximum of two non-ECE courses, subject to prior departmental approval. This constraint does not apply to INFT courses taught by ECE faculty.
5. A maximum of two courses with a C grade may be applied toward the degree. All graduate courses will, however, be counted in the computation of the student's grade-point average.

Seminar Requirement. All degree candidates must have attended a minimum of 10 department seminars.

Thesis Requirement. Students may select one of the following options:

1. Thesis option.
   - Thesis students register for ECE 799 Master's Thesis (6 hours). This option involves a significant research effort, which is conducted under the guidance of a faculty adviser. 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 to be approved by the student's advisory committee. This committee consists of three full-time faculty members, including two from the student's major area and one from outside the area. A fourth member, possibly from outside the department or University, may be optionally added. Thesis students may not register for ECE 798 Research Project.

2. Nonthesis option.
   - Students who select this option must pass a written comprehensive examination in their major area. Each examination consists of six sections, corresponding to the following courses:
     - Communications: ECE 528, 535, 542, 630, 631, 642
     - Computers: ECE 445, 511, 516, 542, 546, 641
     - Control and Robotics: ECE 512, 521, 528, 620, 624, 650
     - Electronics: ECE 565, 571, 584, 586, 587, 689
   - The student may select any four sections from the examination in his or her major area. Registration
for the comprehensive must be approved by the student's academic adviser, and submitted to the graduate coordinator by the end of the fourth week of the semester during which the student plans to take the examination. Students who fail the comprehensive may repeat the entire examination once.

Nonthesis students may register for three hours of ECE 798 Research Project.

Electrical and Computer Engineering Courses (ECE)

500 Signals and Systems: Theory and Applications (3:3:0). Prerequisites MATH 213, MATH 303, MATH 351—not open to Electrical and Computer Engineering students. Fundamental and advanced techniques for system analysis; review of Fourier series and integral: convolution, correlation, power spectrum, bandwidth: communication systems and modulation techniques; sampling and quantization; discrete–time signals and systems. Z–transform: discrete Fourier Transform and FFT algorithms; analysis and design of digital filters.


512 Real–Time Microprocessor Systems (3:3:0). Prerequisites ECE 421 and 511 or equivalent. A course on real–time microprocessor systems with emphasis on control, interfacing techniques, real–time operating systems, and related applications. Topics include basic input–output, interfacing the peripheral analog circuitry, operating systems, programming techniques, process control with microcomputers, and microcomputers for communications. The course includes a simulation and design project.

513 Applied Electromagnetic Theory (3:3:0). Prerequisite ECE 305, MATH 313 or equivalent. Maxwell’s equations, electromagnetic wave propagation, wave guides, transmission lines, radiation and antennas.

516 Advanced Microprocessors (3:3:0). Prerequisite ECE 511 or equivalent. 16–bit and 32–bit microprocessors. Detailed study of the Intel 8086 and Motorola 68000 families (up to 80386 and MC68020). Auxiliary chips of the above families, microcomputers and applications. Brief coverage of NS32000, Z8000, Z80000, AT&T WES32100, NEC V70, V71, DEC MicroVAX 78032. The course includes a laboratory project and demonstration involving the intel 8086 and MC68000 systems.

520 Electronic Systems Analysis (3:3:0). Prerequisite ECE 333. A study of electronic circuits from a systems viewpoint. Topics consist of the analog building block circuits used in system design including operational amplifiers, voltage regulators, video amplifiers, oscillators, modulators, phase–locked loops, multiplexers, active filters, A/D and D/A converters, and optoelectronic circuits.


542 Computer Network Architectures and Protocols (3:3:0). Prerequisites STAT 344 or MATH 351 or equivalent, and graduate standing in SITE. Introduction to the architectures and protocols of computer networks and the 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, and network security and privacy, various examples of computer networks.


555 Introduction to Optical Electronics (3:3:0). Prerequisites PHYS 352, 305, and either ECE 286 or MATH 313. Introduction to optical systems for information gathering, transmission, storage, and processing. Topics include introduction to lasers, solid–state detectors, and optical fibers; variety of
optical sensors, imaging and nonimaging; optical data storage techniques and optical signal processing; optical communications.

587 Optical Fiber Communications (3:3:0). Prerequisites ECE 305, 331, 333 and MATH 313. Study of the 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.

571 Network Analysis (3:3:0). Prerequisite ECE 520 or permission of instructor. Study of linear active and passive networks. Topics include graph theory, network properties, scattering parameters, frequency and time domain representation, sensitivity measures, Telelegen’s theorem, and computer-aided design.

584 Solid-State Device Theory I (3:3:0). Prerequisite ECE 430 or permission of instructor. Study of the theory of semiconductor devices based on solid-state physics. Topics include physics and properties of semiconductors, p-n junction diode, metal semiconductor contacts, MIS diode and CCD, bipolar and field effect transistors.

586 Digital Integrated Circuit Analysis and Design (3:3:0). Prerequisite ECE 331, ECE 430, or permission of instructor. A study of the devices and circuit topologies used in digital integrated circuits. Topics include large signal active device models, MOS and BJT gates, regenerative logic circuits, semiconductor memories, LSI and VLSI circuits.

587 Analog Integrated Circuit Analysis and Design (3:3:0). Prerequisite ECE 333, ECE 430, or permission of instructor. A study of the devices and circuit topologies used in analog integrated circuits. Topics include active device models, differential amplifiers, current sources, output stages, operational amplifiers, frequency response, noise, and computer-aided design.

590 Selected Topics in Engineering (3:3:0). Prerequisite Graduate standing or permission of department. Selected topics from recent developments and applications in engineering. This course is designed to satisfy the needs of the professional engineering community to study current developments in various disciplines.

620 Optimal Control Theory (3:3:0). Prerequisite ECE 521 or permission of instructor. Detailed treatment of optimal control theory and its applications. Topics include system dynamics and performance criteria, the calculus of variations and Pontryagin’s minimum principle, computational methods in optimal control, and applications of optimal control.

621 Estimation, Identification, and Adaptive Control (3:3:0). Prerequisites ECE 521 and ECE 526 or permission of instructor. A detailed treatment of stochastic control theory and its applications. Topics include state space models with random inputs, optimum state estimation, Kalman filtering, Linear Quadratic Gaussian problem, computational issues, stochastic dynamic programming, applications in process control and in decision making under uncertainty.

622 High-Frequency Electronics (3:3:0). Prerequisites ECE 305, 433, 520, MATH 313, or permission of instructor. Study of devices and circuits used in high-speed communications systems. Topics include microwave bipolar transistors, GaAs MESFETs, and high-speed integrated circuits: the design of linear and power amplifiers using S-parameter techniques and computer simulation.

624 (522) Computer Control Systems (3:3:0). Prerequisites ECE 421 and 521 or permission of instructor. 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. The course may include a simulation and design project.

630 Statistical Communication Theory (3:3:0). Prerequisite ECE 528. Introduction to 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.


632 Information Theory (3:3:0). Prerequisite ECE 528 or permission of instructor. Comprehensive study of information with emphasis on concepts of reliable, efficient communication systems. Measure of information, efficient representation of message sources, communication channels and their capacity. Coding for reliable transmission over noisy channels.

633 Coding Theory (3:3:0). Prerequisite ECE 528 or permission of instructor. Mathematics of coding: groups, rings, and fields; polynomial algebra. Linear block codes: generator and parity check matrices; error syndromes. Binary cyclic codes. Convolutional codes; implementation of encoders and decoders.

634 Detection and Estimation Theory (3:3:0). Prerequisite ECE 528. 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 estimations, ML estimations of signal parameters in AWGN and ACGN, estimations of Gaussian waveforms in Gaussian noise, linear MSE estimations, Kalman and Wiener filters.

636 Secure Telecommunication Systems (3:3:0). Prerequisites ECE 632 and ECE 633. Introduction to secure data and voice communications. Topics include theoretical basis of cryptography, random cipher systems, practical security schemes, linear and nonlinear shift registers and encryption algorithms, block encipher and NBS data encryption standard (DES), public key cryptography, RSA, knapsack algorithms, digital signatures and authentication, security of computer networks, cryptographic protocols, key management, speech security, voice scrambling.

637 Spread Spectrum Communications (3:3:0). Prerequisite ECE 631. Introduction to spread spectrum communications. Topics include pseudonoise 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.

639 Satellite Communications (3:3:0). Prerequisite ECE 631 or permission of instructor. Introduction to the 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, optical satellite communications.

640 Spatially Parallel Computers (3:3:0). Prerequisite ECE 546 or permission of instructor. Topics include basic concepts of parallelism, two-dimensional computation schema, types of intercommunication networks between processing elements, single instruction stream–multiple data stream computers, computers with "massive parallelism," pyramid computing structures, multiple instruction stream–multiple data stream computers, and parallel processing of images.

641 Computer System Architecture (3:3:0). Prerequisite ECE 546 or equivalent. Advanced course in computer architecture. Definitions, multiple processors, VLSI architecture, data flow, computation, the semantic gap, high-level language architecture, object-oriented design, RISC architecture, current trends in computer architecture.

642 Design and Analysis of Computer Communication Networks (3:3:0). Prerequisite ECE 542 and ECE 528 or equivalent. Introduction to 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.

644 Architectures and Algorithms for Image Processing (3:3:0). Prerequisite ECE 511 or equivalent. Architectures and algorithms for the analysis and processing of pictorial information. Topics include systems and techniques for the 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. The course includes a design project.

650 Robotics (3:3:0). Prerequisite ECE 521 or permission of instructor. Introduction to robotics and advanced automation from an electrical engineering standpoint. Topics include hardware overview; coordinate systems and manipulator kinematics; differential motion and the inverse Jacobian; manipulator path control and motion planning; design and control of articulated hands; sensory feedback; machine vision; applications to industrial automation.

651 Robotics II (3:3:0). Prerequisite ECE 650 or permission of instructor. In-depth study of the theoretical aspects of robotics. Emphasis on the integration of topics from control theory and machine intelligence. Topics include manipulator dynamics: optimal, self-organizing, and distributed control of manipulators; stability of legged locomotion; mathematical modeling of uncertain knowledge; knowledge-based control of robot systems.

662 (563) Microwave Theory (3:3:0). Prerequisite ECE 513 or permission of instructor. Study of the generation, control, and propagation of microwave signals. Topics include transmission lines, waveguides, resonators, scattering parameters, Smith charts, measurement techniques, instrumentation, and microwave devices.

663 Antennas and Propagation (3:3:0). Prerequisite ECE 513 or permission of instructor. Study of the electromagnetic antennas and the waves which radiate from them. Topics include types of antennas and their characterization, radiative E-M fields, transmission loss, propagation near and around obstacles, and phased arrays.

665 Optical Signal Processing (3:3:0). Prerequisite ECE 565. Study of 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, acousto-optic systems for radar-signal-processing optical computers.

680 VLSI Circuit Analysis and Design (3:3:0). Prerequisite ECE 584 and 586 or permission of instructor. Physics and modeling of various semiconductor devices and fundamental building
block circuits that are extensively used in VLSI design. Topics include review of MOSFETs and BJT devices, SPICE device modeling, inverter and logic circuits, logic minimization, PLA implementation, static and dynamic RAM and problems in VLSI.

684 Advanced Solid-State Device Theory (3:3:0). Prerequisite ECE 584 or permission of instructor. Study of the theory of special microwave and optoelectronic semiconductor devices based on solid-state physics. Topics include tunnel devices, IMPATT diodes, transferred-electron devices, LED and semiconductor lasers, photodetectors, and solar cells.

689 Semiconducting Materials (3:3:0). Prerequisite ECE 584 or permission of instructor. Course on semiconducting materials that are of interest for present and future device applications. Topics include crystal and electronic structure, elemental semiconductors, group III-V and group II-VI compound semiconductors, various material growth techniques, ion implantation, material characterization techniques, and novel device structures.

744 Computer Vision and Expert Systems (3:3:0). Prerequisite ECE 511 and 644. Brief review of image analysis; vision system architectures (human visual system, computer visual systems); vision system operations (focus and zooming); picture recognition languages; introduction to knowledge-based systems; learning algorithmic schemes; applications to text processing/analysis (as expert systems). Design project will be conceived, simulated, and tested by the students.

798 Research Project (3:0:0). Prerequisite 9 hours of graduate-level course work. Research project to be chosen and completed under the guidance of a graduate faculty member, and which results in an acceptable technical report.

799 Master's Thesis (3-6:0:0). Prerequisite 9 hours of graduate-level course work and permission of instructor. Research project to be chosen and completed under the guidance of a graduate faculty member, and which results in a technical report acceptable to a three-faculty-member committee and an oral defense.

For more advanced doctoral-level courses in electrical and computer engineering, see course descriptions under School of Information Technology and Engineering.

Computer Science

Faculty

Acquah, James B., D.Sc., George Washington University, 1988; Assistant Professor
Bottega, Thomas B., D.Sc., George Washington University, 1985; Assistant Professor
De Jong, Kenneth A., Ph.D., University of Michigan, 1975; Associate Professor
Diaz-Herrera, Jorge L., Ph.D., University of Lancaster, 1981; Assistant Professor
Eckart, J. Dana, Ph.D., Georgia Institute of Technology, 1987; Visiting Assistant Professor
Gonzalez, Carlos M., Ph.D., Case Western Reserve University, 1975; Assistant Professor
Hamburger, Henry J., Ph.D., University of Michigan, 1971; Associate Professor
Herath, Jayantha, M.Eng., University of Electro-Communications, Japan, 1984; Visiting Assistant Professor
Kjell, Bradley P., Ph.D., University of Wisconsin, 1985; Assistant Professor
Mark, Abraham M., Ph.D., Cornell University, 1947; Visiting Professor
Michalski, Ryszard, Ph.D., Polytechnical University of Silesia, Poland, 1969; PRC Professor
Norris, Eugene M., Ph.D., University of Florida, 1969; Associate Professor
Onyukse, Ibrahim, H., Ph.D., University of Michigan, 1985; Assistant Professor
Qu, Yaoshuang, Ph.D., University of Wisconsin, 1985; Assistant Professor
Quammen, Donna J., Ph.D., University of Pittsburgh, 1986; Assistant Professor
Rice, Michael D., Ph.D., Wesleyan University, 1973; Associate Professor
Rine, David C., Ph.D., University of Iowa, 1970; Professor, Department Chair
Seidman, Stephen B., Ph.D., University of Michigan, 1969; Professor
Sood, Arun K., Ph.D., Carnegie-Mellon University, 1972; Professor
Wang, Pearl Y., Ph.D., University of Wisconsin, 1980; Assistant Professor
Wechsler, Harry, Ph.D., University of California, Irvine, 1980; Professor

http://catalog.gmu.edu
Areas of Study

Computer Science, M.S.
The Master of Science in Computer Science, offered by the Computer Science Department, is a program designed for individuals who are involved in or wish to become involved in the expanding fields of computer technology. The program encompasses the depth of knowledge needed to pursue more advanced work in computer science or allied areas.

Many graduate classes are offered in the late afternoon and evening to accommodate the professionally employed student. Financial aid in the form of graduate assistantships may be available for full-time students.

Students may avail themselves of course opportunities through the Cooperative Graduate Engineering Program, in affiliation with the University of Virginia and Virginia Tech. Appropriate courses may be transferred, with advisor approval, into the GMU degree program. Refer to section on Certificates, Programs, and Additional Graduate Courses in this catalog.

The major academic computing capability at the University is provided by a CDC Cyber 835, VAX 8500 and 8600 running VMS and UNIX, Pyramid and C-70 UNIX machines, and a VAX 11-750. The CS Laboratories have minicomputers, an HP 1000 for microprogramming, an HP 9040 for computer graphics, AI and graphics systems, and a PDP-11/44 for use by students and faculty. Several microcomputer laboratories, including software engineering software, and a large graphics facility are available as well. Additional equipment is in operating systems, artificial intelligence, parallel computation, and computer graphics and vision laboratories.

Admission Requirements
A student seeking admission to this program will be expected to satisfy the following requirements:

1. Fulfill all admission requirements of the Graduate School of George Mason University.

2. Hold a baccalaureate degree including those courses or their equivalents in practical experience comprising the body of knowledge which is commonly held to be preparatory for continued study in computer science. These include courses in Data Structures and Algorithms (CS 211, 312), Assembly Language Programming (CS 311), and Computer Architecture (CS 365). In addition, the student should have completed one year of mathematics beyond first-year calculus, including a substantial course in discrete mathematics (MATH 305). A student with 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 degree.

3. Have an undergraduate cumulative grade-point average over the last two years of 3.0, preferably with a major in a technical field such as computer science, mathematics, physics, or engineering.

4. Submit transcripts of all post-secondary education, a self-assessment form (normally included in the application package or available from the department), three letters of recommendation, and an official GRE (Graduate Record Examination) report showing verbal and quantitative scores.

Degree Requirements
In addition to the general requirements of the University, completion of this program requires the following:

1. Completion of 33 hours of graduate course credit, including the following:
   a. Nine hours comprising the following courses: CS 540 Language Processors
      CS 571 Operating Systems
      CS 583 Data Structures and Analysis of Algorithms
   b. Twelve or more hours of computer science courses at the 600 level or above, excluding CS798 and 799
   c. Three hours of project work or three to six hours of thesis for a total of not more than six hours; or three additional hours of course work at the 600 level or above
   d. Additional graduate-level courses in computer science or in closely related fields, chosen in consultation with the adviser

2. For students electing the project or thesis option, presentation of the student’s project or thesis at an appropriate forum approved by the department graduate committee.

Course Work
The department offers computer science courses in general areas of software engineering, artificial intelligence, parallel processing, and foundations of computer science. A complete list appears below and is available from the department by request.

The department actively participates in the program leading to the Ph.D. degree in information technology in the School of Information Technology and Engineering.

Starting in fall 1988, students in the systems engineering and the computer science programs may pursue a specialization in software systems engineering. To complete the software engineering track, students must complete the required courses and Option A, B or C in systems engineering; within Option A, B or C students must complete four graduate-level CS/SYST courses in software engineering rather than completing four electives. The four CS/SYST courses to be completed are CS/SYST 560, Introduction to Software Systems Engineering; CS/SYST 665, Formal Methods and Models; CS/SYST 670, Requirements Analysis, Prototyping, and Design; and CS/SYST 685, Software Project Management.

Computer Science Courses (CS)

531 Theory of Computation (3:3:0).
Prerequisites CS 311 and MATH 305; CS 331 strongly recommended. Theory of computability, Turing machines, computable functions, recursive functions, unsolvable decision problems and Godel’s Incompleteness Theorem, computational complexity.

http://catalog.gmu.edu
540 Language Processors (3:3:0). Prerequisites MATH 305, CS 212 and 311. Basic programming language processors: 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.


560/SYST 560 (formerly 521). Introduction to Software Engineering (3:3:0). Prerequisite Admission to the MSCS or MSSE program or permission of instructor. The software product lifecycle. Process models and metrics. Modern language concepts, including information hiding, inheritance, message passing, and concurrency as exemplified by Ada and other current languages. Design, implementation, and validation of software systems using the Ada programming language. Computer-based tools to support modern software development practices are emphasized.

568 Computer Systems Programming (3:3:0). Prerequisites CS 211 and 311. Introduction to assemblers, compilers, systems structures, operating systems, and machine architecture.


580 Introduction to Artificial Intelligence (3:3:0). Prerequisites CS 212 and MATH 305. Principles of representation, heuristic search and control in the context of specific intelligent systems in such areas as problem-solving, vision, medical diagnosis, and natural language. The LISP PROLOG, or expert systems programming languages as a means of representation.

583 Data Structures and Analysis of Algorithms (3:3:0). Prerequisites CS 212 and MATH 305. This course gives a thorough introduction to the design and analysis of algorithms. Topics to be covered include review of basic data structures and their implementation, measures of time and space complexity, algorithms for internal and external sorting and searching, graph algorithms, and an introduction to computational complexity.

611 Introduction to Computers (3:3:0). Introduction to computer systems. Design-oriented programming languages. Provides experience in multiprogramming or personal computing modes. Primarily for individuals with no prior computer experience. Credits are not applicable toward the 30 credits required for the M.S. in mathematics or the 33 credits required for the M.S.C.S., but may be applicable toward a degree in some other fields.

612 The Use of Computer Statistical Packages (3:3:0). Prerequisite Course in statistics. Introduction to use of computer packages in the statistical analysis of data. Emphasizes techniques common to use of all statistical packages, including data checking, cleaning, manipulation, and transformation. Both simple and complex statistical analyses are covered. Techniques are illustrated by concentrating on one of the major statistical packages such as SAS or SPSS. Other packages are discussed and compared. Students are expected to perform computer statistical analyses of data relevant to their respective fields of study. Credits are not applicable toward the 30 credits required for the M.S. in mathematics or CS, but may be applicable toward a degree in some other fields.

621 Software Design Methodologies (3:3:0). Prerequisite CS 521. Methodologies that affect the development of reliable and portable software. The methods discussed include strategies and formal approaches to software specification, design, and verification that produce software systems with a minimum of cost and time and that show high reliability, portability, and user friendliness and effectiveness. Also highlighted are specific managerial issues raised by large, complex software projects.

640 Theory of Programming Language Translation (3:3:0). Prerequisite CS 540. Programming language translation and concepts in compiler design. Topics include formal grammars, finite state automata as recognizers for finite state grammars, lexical scanning, context-free languages and push-down automata, context-free parsing techniques, run-time environments.
necessary to support language techniques of code
generation. Students work on projects to
demonstrate the various concepts and consult the
current literature concerning recent advances in the
theory and practice of programming language
translation.

651 Interactive Graphics Software (3:3:0). Prerequisite CS 451 or 551. Interactive graphics programming. Architecture of display devices. Graphics systems functional capabilities. Implementation concepts and techniques. Extends basic raster techniques to device independent algorithms: two and three dimensional viewing, clipping, and transformations. Raster/scan conversion techniques, hidden surface and edge removal algorithms, shading and texturing. Fundamental algorithms (such as greedy methods, divide and conquer strategies, dynamic programming, search and traversal techniques, approximation algorithms, image processing), the analysis of specific algorithms falling into these classes. NP-Hard and NP-Complete problems.

658 Microprogramming (3:3:0). Prerequisite CS 468 or a graduate course in systems programming. Instruction sets and the hardware organization of a microprogrammable central processor. Assembly languages, instruction set modification, I/O programming, Interrupt handling, DMA programming. Microprogram development. A substantial hands-on microprogramming experience using a dedicated computer architecture lab.

671 Computer Systems Theory (3:3:0). Prerequisite CS 571, MATH 351, or permission of instructor. Advanced computer systems concepts, including models and mechanisms of operating and distributed system structure and techniques of modeling and analysis.

672 Computer System Performance Evaluation (3:3:0). Prerequisite CS 571, MATH 351. Theory and practice of measuring and evaluating digital computer systems. Topics include systems analysis techniques, simulation techniques, data requisition, programmed measurement techniques, instrumented measurement techniques and presentation of data.

680 Natural Language Processing (3:3:0). Prerequisite CS 580 or permission of instructor. Principles of the design of computer programs that respond appropriately to questions, commands, and statements expressed in human language, particularly English. Role of knowledge representation and linguistic theory. Students are expected to become familiar with current literature to implement a limited natural language processor.


682 Computer Vision (3:3:0). Prerequisite CS 580. Study of computational models 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.

683 Analysis of Algorithms (3:3:0). Prerequisite CS 563. A second course on the analysis of algorithms. Topics include the analysis of sequential and parallel algorithmic strategies (such as greedy methods, divide and conquer strategies, dynamic programming, search and traversal techniques, approximation algorithms, image processing), the analysis of specific algorithms falling into these classes. NP-Hard and NP-Complete problems.

684 Graph Algorithms (3:3:0). Prerequisite CS 583. Data structures and analytical techniques for the study of graph algorithms. Data structures discussed include disjoint sets, heaps and dynamic trees. Algorithms treated include minimum spanning trees, shortest path, maximum flow, and graph planarity.

697 Independent Reading and Research (1-3:0:0). Prerequisites Graduate standing; completion of at least two core courses (CS 540, 571, 583) and permission of instructor. In areas of importance but insufficient demand to justify a regular course, an individual student may undertake a course of study under the supervision of a consenting faculty member. A written statement of the content of the course and a tentative reading list will normally be submitted by the student as part of the request for approval to take the course. A literature review, project report, or other written product is normally required.

699 Advanced Topics in Computer Science (3:3:0). Prerequisite Permission of instructor. Special topics in computer science not occurring in the regular computer science sequence will be presented in this course. The course may be repeated for credit if subject matters in distinct offerings of the course differ.

782 Machine Learning (3:3:0). Prerequisite CS 580 and permission of instructor. Survey of the field of machine learning. Topics provide broad coverage of past and current developments in machine learning.

798 Project Seminar (3:3:0). Prerequisite 18 hours of credit applicable toward the M.S. in CS. Master's degree candidates undertake a project utilizing what they have learned in the M.S. program. Topics chosen in consultation with adviser. Project carried out intended to meet the project--or--thesis requirement for the M.S. in CS.

799 Thesis (3-6:0:0). Prerequisite 18 hours of credit applicable toward the M.S. in CS. Original or expository work is evaluated by a committee of three faculty members.
Conflict Management

Faculty
Avruch, Kevin A., Ph.D., University of California at San Diego, 1978; Associate Professor, Anthropology
Black, Peter W., Ph.D., University of California at San Diego, 1977; Associate Professor, Anthropology
Broome, Benjamin J., Ph.D., University of Kansas, 1980; Associate Professor, Communication
Burton, John W., Ph.D., London School of Economics, 1942; University Professor of Conflict Resolution
Gortner, Harold F., Ph.D., Indiana University, 1971; Associate Professor, Public Administration; Chair, Department of Public Administration
Horton, Lois E., Ph.D., Brandeis University, 1977; Associate Professor, Sociology
Laue, James H., Ph.D., Harvard University, 1966; Lynch Professor of Conflict Resolution
Mitchell, Christopher R., Ph.D., University of London (University College), 1977; Professor of Conflict Resolution and International Relations
Rubenstein, Richard E., M.A., Oxford, 1961; J.D., Harvard University, 1963; Professor of Conflict Resolution and Public Affairs
Sandole, Dennis, J.D., Ph.D., University of Strathclyde, Scotland, 1979; Associate Professor, Public Affairs; Faculty Associate, Conflict Resolution
Scimecca, Joseph A., Ph.D., New York University, 1972; Professor of Conflict Resolution and Sociology; Director, Center for Conflict Analysis and Resolution
Taylor, Anita, M.G.B., Ph.D., University of Missouri, 1971; Professor, Communication

Conflict Management, M.S.
The Master of Science in Conflict Management, offered by the Center for Conflict Analysis and Resolution, is a two-year professional M.S. degree program offering advanced training in the theories, concepts, methods, and application of conflict management skills. Students are trained to understand conflict and to apply tested methods (e.g., conciliation, mediation, arbitration, and negotiation) in the management of conflict. Intensive classroom study is combined with practical work in laboratory, simulation, fieldwork, and internship courses. Nearly half the degree courses concern learning practical skills in conflict management. The degree program, the first to be offered in the United States, provides an opportunity for a professional career in the emerging discipline of conflict management through work and service in public and private organizations, institutional settings, firms, and agencies, and opportunities for professionals now engaged in conflict management work to further advance their knowledge and skills.

Admission Requirements
In addition to meeting all Graduate School requirements for admission, students in the conflict management program must have a GPA of no less than 2.75 in all undergraduate work; submit GRE scores on verbal and quantitative sections; provide three letters of recommendation, one of which must be from a faculty member in the applicant’s undergraduate major department; submit GRE general test scores; and write a brief essay stating their reasons for seeking admission to the program. Admission is on a semester basis; students will be admitted in the fall and spring semesters of an academic year, and may begin their study as either full- or part-time students. Any part-time student may become a full-time student when program curriculum offerings make it possible. Graduate students in other degree programs who seek to enroll in conflict management courses may enroll with the permission of the course instructor. An internship course requirement is offered only in the summer session, following completion of the first year of full-time study. Before admission to the internship, students must pass a preliminary comprehensive examination. Students who plan to attend classes on a part-time basis will require a much longer time to complete the M.S. degree. Since this is a professional program, students applying for admission should not expect to substitute transfer credit for a course or requirement leading to the M.S. degree.

Degree Requirements
Each student is required to successfully complete 48 credits, 6 of which are electives. Within CONF 642, an "exit" paper of publishable quality on an approved research or demonstration project is required.

Note: Directed reading and research courses (CONF 697) and the optional master of science thesis course (CONF 699) may not be substituted for the required written and oral examinations. The following are required courses:

Conflict Management Courses (CONF)
501 Introduction to Conflict Resolution (3:3:0). Prerequisite or corequisite for all courses in the program. Conflict resolution as an emerging field; the analytical and problem-solving approach and its origins in theory and in practice; similarities to and differences from other means of dispute management; moving from institutions to individuals as unit of analysis; implications of conflict resolution.
processes for intergroup, industrial, communal, and international relations.

601 Theories of Conflict and Conflict Resolution (3:3:0). Prerequisite CONF 501 or permission of instructor. Introduction to the major behavioral and social scientific theories of conflict. These theoretical models are analyzed and critiqued in terms of their applicability to conflict resolution.

602 Third Party Roles, Resources, and Ethics (3:3:0). Prerequisite CONF 501 and 613, or permission of instructor. Analysis and critique of the nature and purposes of third party behavior in conflicts. Theoretical perspectives and case histories are used to understand the settings in which third parties may operate; such third party roles as mediator, conciliator, arbitrator and facilitator; and types of intellectual and other resources third parties are able to bring to conflicts. Frameworks for assessing the ethics of third party intervention will be developed and applied in a variety of conflict settings.

603 War, Violence, and Conflict Resolution (3:3:0). Prerequisite CONF 501 or permission of instructor. Investigation of the causes and consequences of political violence (civil disorder, terrorism, revolution, and war), focusing on how the insights gained may be applied to the resolution of deep-rooted conflicts. Students study the historical materials, theory, and application of theory to the resolution of specific disputes.

610 Philosophy and Methods of Conflict Research I (3:3:0). Prerequisite CONF 501 or permission of instructor. Introduction to comprehensive research design including a critical assessment of quantitative strategies used in conflict and conflict resolution research (e.g., sample design, theory and techniques of measurement, questionnaire design, data collection and analysis, interpretations).

613 Laboratory and Simulation I: Interpersonal and Intergroup Conflict (3:3:0). Prerequisite CONF 501 or permission of instructor. Survey of strategies that can be employed to more effectively understand and attempt the resolution of conflicts at the interpersonal and intergroup levels.

617 Philosophy and Methods of Conflict Research II (3:3:0). Prerequisite CONF 501 and 610 or permission of instructor. Introduction to basic qualitative research methods, including participant observation, case studies, non-obtrusive measures and techniques of fieldwork. The course also provides cross-cultural fieldwork experience, working with social and cultural groups unfamiliar to students.

620 Law and Jurisprudence in Conflict Resolution (3:3:0). Prerequisite CONF 501 or permission of instructor. Examination of the ways in which legal processes and institutions are related to the definition, analysis, and resolution of human conflicts. Compares conventional methods of legal dispute resolution with newer methods of "alternative dispute resolution," contrasting both with the method of analytical conflict resolution.

621 Ethnic and Cultural Factors in Conflict Resolution (3:3:0). Prerequisite CONF 501 or permission of instructor. Examination of the role culture plays in the genesis, structuring, and resolution of processes of conflict within and between groups. Special attention is given to ethnicity and other subcultural markers of identity in complex social systems as both the generators and outcomes of conflict. The relevance of these variables to the success or failure of conflict resolution will be explored.

623 Laboratory and Simulation II: Community and Organizational Conflicts (3:3:0). Prerequisite CONF 501 and 613, or permission of instructor. Survey of strategies and skills that can be used to understand and attempt to resolve conflicts at the community and organizational levels.

633 Laboratory and Simulation III: International Conflict (3:3:0). Prerequisite CONF 501, 613, and 623, or permission of instructor. Students observe demonstrations of techniques and processes of third-party intervention in conflicts at the international level. Students also have role-playing opportunities to simulate and thereby experience the use of these techniques and processes.

635 Structural Sources of Conflict (3:3:0). Prerequisite CONF 501, 601, and 603, or permission of instructor. Examination of the ways structures and institutions affect behavior and give rise to conflictual relationships at all social levels, from the interpersonal to the international. The role of conflict resolution as a means of gradual system change is examined.

642 Integration of Theory and Process (3:3:0). Taken in the last semester of student's course work. Course designed to assist students in bringing the different aspects of conflict resolution together into an integrated whole, and to be a final assessment. A major essay of publishable quality describing an approved research or demonstration project is required.

694 Internship (3:3:0). Prerequisite: 21 hours of course work and successful completion of preliminary examination. 160 hours of work within a chosen agency or institution directly involved with conflict resolution processes at the individual, community, organizational, or international level. (Summer session only.)

695 Special Topics In Conflict and Conflict Resolution (3:3:0). Prerequisite CONF 501 or permission of instructor. Course content varies depending upon interests of instructor and students. May be repeated once.

697 Directed Reading and Research (3:3:0). Independent reading on a specific topic related to conflict and conflict resolution as agreed to by a student and a faculty member. May be repeated once.
Economics

Faculty

Alexeev, Michael, Ph.D., Duke University, 1984; Assistant Professor
Bennett, James T., Ph.D., Case Western Reserve University, 1970; Professor
Bloch, Howard R., Ph.D., Princeton University, 1964; Professor
Boudreaux, Donald J., Ph.D., Auburn University, 1986; Assistant Professor
Buchanan, James M., Ph.D., University of Chicago, 1948; University Distinguished Professor
Chung, Jae W., Ph.D., New York University, 1972; Associate Professor
Coelho, Phillip R.P., Ph.D., University of Washington, 1969; Professor
Crain, W. Mark, Ph.D., Texas A & M University, 1976; Professor
DiLorenzo, Thomas J., Ph.D., Virginia Polytechnic Institute and State University, 1979; Associate Professor
Grier, Kevin, Ph.D., Washington University in St. Louis, 1984; Assistant Professor
High, Jack C., Ph.D., University of California at Los Angeles, 1980; Assistant Professor
Lavole, Donald C., Ph.D., New York University, 1981; Associate Professor
Levy, David M., Ph.D., University of Chicago, 1979; Assistant Professor
Phillips, Samuel H., Ph.D., University of Virginia, 1966; Professor
Reid, Joseph, Ph.D., University of Chicago, 1974; Associate Professor
Roback, Jennifer, Ph.D., University of Rochester, 1980; Assistant Professor
Rowley, Charles, Ph.D., University of Nottingham, 1964; Professor
Selgin, George A., Ph.D., New York University, 1986; Assistant Professor
Shughart, William, Ph.D., Texas A & M University, 1978; Associate Professor
Tollison, Robert, Ph.D., University of Virginia, 1969; Professor
Vanberg, Viktor, Ph.D., Universitat Mannheim, 1981; Associate Professor
Vaughn, Karen I., Ph.D., Duke University, 1971; Professor

Wiest, Phillip R., Ph.D., University of Pittsburgh, 1976; Associate Professor
Williams, Walter E., Ph.D., University of California at Los Angeles, 1972; John M. Olin Distinguished Professor of Economics

Economics, M.A.

The Master of Arts in Economics is designed to provide students with a strong foundation in economic analysis and the opportunity to apply this knowledge in specialized subject areas. The program is designed to serve:

1. Students with recent baccalaureate degrees who wish to become qualified for employment with public and private institutions that hire economists:
2. Individuals employed in business and government who desire to further their professional careers through graduate training in economics:
3. Students who intend to continue toward a Ph.D. in economics.

Admission Requirements

In addition to the entrance requirements of the Graduate School, the applicant is expected to hold a baccalaureate degree in economics. Students with an undergraduate major in a field other than economics may be admitted if their record demonstrates sufficient background in economics and allied fields. MATH 108 or its equivalent is required for admission to degree status.

Undergraduate deficiencies must be made up by completion of appropriate remedial work including intermediate macro- and microeconomic analysis, taken without graduate credit. Before admission to degree status, students must submit two letters of recommendation and satisfactory GRE scores. The GRE scores may be waived if an applicant holds a graduate degree in another field, or has completed 6 to 12 hours of graduate course work in nondegree status or extended studies enrollment with a GPA of at least 3.00. Applications for admission to the M.A. program for the fall semester must be received by May 1, and by November 1 for the spring semester.

Degree Requirements

Students must meet departmental degree requirements for all M.A. students and specific requirements depending on which track (thesis or nontesis) is chosen.

General Core Requirements

All students are required to complete 30 semester hours of graduate credit. Three of the required core courses are in micro- and macroeconomic theory (ECON 611, 615, 812). Up to 21 hours of elective courses may be taken. Electives may be chosen from several areas, including public choice, public finance, labor economics, industrial organization, international trade, resource economics, environmental economics, urban economics, Austrian economics, economic history, history of economic thought, and monetary economics. In some cases, students may receive departmental permission to substitute up to six

http://catalog.gmu.edu
hours of electives taken outside the economics department in closely related fields.

All students are required to pass comprehensive examinations in micro- and macroeconomic analysis. The examinations are offered twice a year, usually in September and April, and are normally taken immediately upon completion of the core courses.

**Thesis Track**

The thesis track offers up to six hours of graduate credit for independent research and writing under the direction of a departmental supervisor in lieu of elective classroom hours. This means that the student who chooses the thesis track may receive 15 hours of credit for electives and 6 hours of credit for thesis research (ECON 795 or 799). Normally a student selecting the thesis track would choose a topic in an area related to the elective courses.

**Public Policy Track**

Courses leading to an M.A. in economics with a particular emphasis in public policy are offered at our Metro Campus in Arlington. Students in the public policy track can select their courses from a recommended set offered at the Metro Campus or from our Main Campus offerings.

**Economics, Ph.D.**

The Ph.D. in economics provides rigorous training in the discipline. A common core of courses is taken by all candidates for the degree, with a wide variety of field specialization options once the core requirements are completed. Core courses include micro and macro theory, econometrics, mathematical economics, economic history, and history of economic thought. Our graduates will be familiar with the state and frontiers of the discipline and will be capable of carrying on substantive research programs of their own.

Recognizing the special character of students in this area, our Ph.D. program has two tracks. The traditional track prepares students for a career in economic research in government, in business, or in universities. The applied track places a heavy emphasis on public policy and is especially suited for upper-level government workers who deal extensively with economics on the job.

**Admission Requirements**

Prerequisites for admission into the doctoral program in economics include an undergraduate degree from an accredited institution, with a 3.00 GPA or higher the last two years of that baccalaureate program; a 3.00 or higher GPA in undergraduate economics courses; and training in economics at least through the intermediate level of micro- and macroeconomic theory. An applicant is also required to have an adequate background in mathematics, through calculus, and in statistics. A student without these prerequisites will be required to take ECON 306 and 311 (the undergraduate theory sequence), Mathematics 113 and 114 (calculus), and Decision Sciences 200 and 202 (statistics). The mathematics and statistics may be taken in the initial stages of the graduate program.

An application for the doctoral program must include undergraduate and graduate transcripts, two letters of reference, and scores from the Graduate Record Examination, including both the general exam and the subject exam in economics. In some cases GRE scores may be waived at the written request of an applicant who has earned an M.A. degree in economics from an accredited institution.

Applications for admission to the program for the fall semester must be received by April 1 (February 1, if financial aid is desired) and October 1 (September 1, if financial aid is desired) for the spring semester.

**Degree Requirements**

The Ph.D. degree in economics is not granted automatically upon completion of a set of course requirements. It is granted only to candidates who have shown a thorough knowledge of economic theory in their fields of concentration and have demonstrated the ability to conduct sound independent research. A minimum amount of course work with satisfactory performance, however, is necessary to demonstrate this level of scholarship. A doctoral student must complete 72 credit hours, including a minimum of 48 credit hours of course work, and up to 24 hours of dissertation credit on an approved research topic. To ensure the high standards adopted by the Economics Department for its doctoral program, students will be required to take a set of core courses in theory, quantitative techniques, the development of economic thought, and economic history.

Each doctoral student is required to take six credit hours in graduate microeconomic theory (ECON 611 and 812) and six credit hours in macroeconomic theory (ECON 615 and 816). Three credit hours in mathematical economics (ECON 630) and three credit hours in econometrics (ECON 637) are required to ensure adequate training in quantitative methods. Each doctoral student is also required to take three credit hours in the history of economic thought and three credit hours in economic history. A student is required to take a minimum of six credit hours of courses in each of the two specialization fields for which the student will write comprehensive exams. Up to six hours may be taken in course work in other disciplines approved by the department. Transfer credits from accredited graduate programs in economics will be evaluated on a case-by-case basis.

Preparing for and passing comprehensive exams are an integral part of the Ph.D. program. General theory exams are used as a qualifying requirement for the Ph.D. In addition, Ph.D. candidates are required to pass field exams that demonstrate professional competence in their two chosen areas of specialization. The general theory exams are given twice a year. The field exams will be scheduled according to course offerings and student interest in the particular specialized fields, but no more than twice a year.
The department offers field exams in the following areas, although particular course sequences are still in the developmental stage:

Public Choice
Public Finance
Economic History
Political Economy
Austrian Economics
Monetary Theory and Policy
History of Economic Thought
Econometrics
Labor Economics
Economic Development
Industrial Organization
Urban and Regional Economics
International Trade and Finance
Resource and Environmental Economics

Core Requirements for the Economics Ph.D. (total 36 hours):

Microeconomic Theory (6)
Macroeconomic Theory (6)
Mathematics for Economists (3)
Statistics and Econometrics (3)
Economic History and History of Thought (6)
Field I (6)
Field II (6)

In addition, students must take elective courses to complete the required 48 hours of course work. The dissertation must be completed within five years after passing the theory qualifying exams.

Economics Courses (ECON)

Departmental Course Prerequisites

ECON 306 and 311, or equivalent, are prerequisites for all graduate courses except ECON 600 and 602. Additional prerequisites are noted. With permission of the instructor prerequisites may be waived.

Prerequisites DESC 200 and 202 or permission of instructor. Applied introduction to estimating economic relationships. Simple equation and simultaneous equation system estimation along with their associated problems.

600 Current Issues in Economics (3:3:0) (B).
Prerequisite Graduate standing or permission of instructor. For students with little economic background. Topics include supply and demand, operation of a free market system, stock and bond markets, and U.S. role in world economy. May be used in partial fulfillment of the course requirement in the teaching discipline for the master's degree in education.

602 Economic Analysis (3:3:0).
Prerequisite Baccaulareate degree. This course cannot be taken for graduate credit toward a graduate degree in economics. A rigorous, concentrated introduction to micro- and macroeconomic analysis. Emphasized are economic concepts, tools of analysis, and business applications.

611 Microeconomic Theory (3:3:0).

615 Macroeconomic Theory (3:3:0).
Classical, neoclassical, Keynesian, and post-Keynesian theories of income and employment determination. Theories of inflation and growth. The demand for money and its implications for the effectiveness of monetary vs. fiscal policy.

623 American Economic History (3:3:0).
Growth and development of the American economy as well as the evolution of economic institutions.

630 Mathematical Economics I (3:3:0) F. Topics include set theory, function, differential calculus, integration, series, and matrix algebra, with special emphasis on the economic applications.

637 Econometrics I (3:3:0).
Prerequisites DESC 200 and 202 or permission of instructor. Techniques of estimating relationships among economic variables. Introduction to multiple regression and problems associated with the single equation model-autocorrelation, multicollinearity and heteroscedasticity.

Capitalism, socialism and corporatism historical perspective. Includes examination of the economies of representative contemporary countries.

812 Microeconomic Theory II (3:3:0).
Prerequisite ECON 611. Nature of the firm, theory of supply, and production functions, factor pricing, and supplies. Introduction to microeconomic foundations of theories of public finance and public choice.

816 Macroeconomic Theory II (3:3:0).
Prerequisites ECON 611, 615 and 535 or permission of instructor. Aggregate economic activity and price levels with emphasis on dynamic models. Topics vary.

817 Monetary Theory and Policy (3:3:0).
Theory of the mechanisms through which central banking affects economic activity and prices. Analysis of the demand for money and its relationship to economic activity. The development of monetary theory with emphasis on current theories and controversies in the field.

820 History of Economic Thought (3:3:0).
Major figures in the history of economic thought and the tools of analysis they created; emphasis on classical, neoclassical, and Keynesian theories.

821 History of Economic Thought II (3:3:0).
Development of economic analysis from the "marginal revolution" of 1877 to present. Emphasis on the development of neoclassical economic theory.

823 Topics in Economic History (3:3:0).
Prerequisites ECON 611 and 615. Economic analysis of various historical epochs, such as the Industrial Revolution, Evolution of Political Reform, Rise of Unions, Growth of Government.

825 Political Economy and Public Policy I (3:3:0).
Prerequisites ECON 611 or permission of instructor. Economic process of public policy formulation and implementation. Economic behavior of principals in policy making and execution.
Areas of Study

826 Political Economy and Public Policy II (3:3:0). Prerequisites ECON 611, 615, and 625 or permission of instructor. Specific issues related to political economy of public policy. Topics include privatization, political economy of deficit spending, regulation and deregulation, and the economics of rent seeking.

827 Economic Philosophy (3:3:0). Prerequisite ECON 611 or permission of instructor. Analysis of the philosophical organization. Interrelations between economics and legal and political institutions. Philosophical presuppositions of a capitalist economy under constitutional democracy. Consideration of alternative presuppositions for noncapitalist economies. Critical evaluation of history of ideas in social and moral philosophy.

828 Constitutional Economics (3:3:0). Prerequisite ECON 611 or permission of instructor. Analysis of existing and proposed elements of the "economic constitution." Emphasis on fiscal, monetary, transfer, and regulatory powers of government and on constitutional limits on such powers, especially in the United States. Also includes analysis of proposed changes in these limits.

831 Mathematical Economics II (3:3:0). Prerequisite ECON 630 or permission of instructor. Mathematical treatment of economic theories. Static and dynamic analysis of macro-models. Input-output analysis. Optimization techniques such as Lagrangian multipliers, linear programming, nonlinear programming, and game theory.

838 Econometrics II (3:3:0). Prerequisite ECON 637 or permission of instructor. Econometric models and simultaneous equation systems. Identification of parameters and least squares bias; alternative estimation methods and block recursive systems.


851 State and Local Public Finance (3:3:0). Analysis of public spending and taxation at the subfederal level. Theory of public goods, positive and normative explanatory models of public expenditure determination, and intergovernmental fiscal relations. Problems in the provision of specific state and local services, including education and police and fire protection.

852 Public Choice (3:3:0). Prerequisite ECON 611 or permission of instructor. Application of economic theory and methodology to the study of nonmarket decision making.

853 Special Topics in Public Finance (3:3:0). Prerequisites ECON 611 and 849. Topics vary; announced in Schedule of Classes.

854 Public Choice II (3:3:0). Prerequisite ECON 611 or permission of instructor. This is the second course in the two course sequence in public choice. The public choice approach will be applied to study such topics as the causes and consequences of governmental growth, the behavior of public bureaucracies, and the economic reasoning behind constitutional limitations on the size and growth of government.

856 Urban and Regional Economics (3:3:0). Prerequisite ECON 611 or permission of instructor. Regional development and metropolitan growth economics including the locational decisions of households and firms, and problems associated with high-density urban economic activity.

858 The Economics of Urban Transportation Planning (3:3:0). Issues and problems in urban transportation planning using various analytical techniques; planning for the future; techniques of evaluation; environmental and socioeconomic impact.

860 Resource Economics (3:3:0). Resource management in the public sector with emphasis on development of water resources. Problems of uncertainty, time horizon considerations, joint costs, multiple benefits, nonquantifiable benefits and costs.


866 Economic Development (3:3:0). Forces contributing to and retarding economic progress in developing countries. The role of foreign trade, economic integration, foreign investment, multinational corporations, and technological transfers.

869 International Trade and Policy (3:3:0). Classical, neoclassical, and modern theories of international trade. A study of the theory and practice of world trade models such as project LINK. Analysis of foreign investment and economic growth, tariffs and nontariff barriers, and economic integration; recent developments with emphasis on natural resources. (May not be taken for credit by students who have completed ECON 590.)
871 International Monetary Economics (3:3:0). Examination of the international adjustment mechanism, price and income effects, controls and the monetarist approach. Development of the international monetary system, the demand for international reserves, capital movements, and the role of the International Monetary Fund. (May not be taken for credit by students who have completed ECON 590.)

872 Managerial Economics (3:3:0). Prerequisites ECON 802 and BUAD 641. Economic theory as it applies to specific business situations and decisions. Production levels, price determination, cost, competition, profits, supply/demand.

876 Marxian Economics (3:3:0). Prerequisites ECON 611 and 615. Major Marxian economic theories and criticisms of Marxian economics.


880 Austrian Theory of the Market Process I (3:3:0). Prerequisite ECON 611. Economic theory developed by Menger, Mises, Hayek, and others of the Austrian School and comparison to other currently popular theories.

881 Austrian Theory of Market Process II (3:3:0). Prerequisites ECON 611, 615 (ECON 860 is recommended). Continuation of ECON 880. Topics vary and include emphasis on market-process approach to analysis of capital accumulation, growth, money and credit institutions, inflation, unemployment, and industrial fluctuations.

895 Special Topics in Economics (3:3:0). Topics vary according to interests of instructor. Emphasis on new areas of the discipline. May be repeated as topics vary.

896 Directed Reading and Research (3:0:0). Independent reading and research paper on a topic agreed on by student and faculty member.

799 Thesis (3-6:0:0). Students who take ECON 896 and then elect the thesis option receive three credits for ECON 799 upon completion of the thesis. Students who do not take ECON 896 receive six credits for ECON 799 upon completion of the thesis.

800 Studies for the Doctor of Arts in Education (variable credit). Prerequisite D.A.Ed. student admission to study in economics. Studies designed by student's discipline director and approved by student's doctoral committee, which brings the student to participate in the current research of the discipline director and results in a paper reporting the original contributions of the student. The paper is presented in a subsequent D.A.Ed. summer seminar. Enrollments are repeated according to each student's program.

918 Seminar in Monetary Theory and Policy (3:3:0). Selected topics of current interest are discussed.


945 Seminar in Industrial Organization (3:3:0). Topics include centrifugal and centripetal forces affecting aggregate and industry concentration; the impact of market structure on the rate of innovation, concentration, and oligopolistic price behavior; constraints on oligopolistic pricing; vertical integration; traditional antitrust policy, regulation, and state ownership.

950 Seminar in Public Finance (3:3:0). Prerequisites ECON 611 and 849. Important public finance issues treated in seminar format.

955 Seminar in Urban and Regional Economics (3:3:0). Prerequisite ECON 611. Development of regional economics of metropolitan areas and larger regions.

955 Seminar in Economic Development (3:3:0). Prerequisites ECON 611 and 615. Topics vary and include macroeconomic and trade policies, inflation and labor migration.

970 Seminar in International Economics (3:3:0). Prerequisites ECON 869 and 871. Topics vary and include subjects of current research and policy interests.

999 Doctoral Dissertation Research (credits vary). Prerequisites Admission to Ph.D. economics program and permission of dissertation adviser. Research on an approved dissertation topic under the direction of dissertation committee. May be repeated. 24 credit hours may be applied to doctoral degree requirement.
Education: Curriculum and Instruction

Faculty

Behrmann, Michael M., Ed.D., Columbia University, 1978; Associate Professor
Beyer, Barry K., Ph.D., University of Rochester, 1962; Professor
Bindel, Henry J., Ed.D., University of Maryland, 1971; Professor
Bonfadini, John E., Ph.D., Virginia Polytechnic Institute and State University, 1976; Associate Professor
Bowen, Larry S., Ph.D., Ohio State University, 1970; Professor
Brown-Azarowicz, Marjory, Ph.D., University of Washington, 1961; Professor Emeritus
Burger, Christine, Ph.D., Iowa State University, 1984; Research Assistant Professor
Chu, Harold, Ph.D., University of Minnesota, 1973; Associate Professor
Collier, Virginia P., Ph.D., University of Southern California, 1980; Assistant Professor
Duck, Lloyd E., Ph.D., University of Virginia, 1974; Associate Professor
Dzama, Mary A., D.Ed., University of Virginia, 1972; Associate Professor
Gilstrap, Robert L., Ed.D., George Peabody College, 1963; Professor
Given, Barbara K., Ph.D., Catholic University of America, 1974; Associate Professor
Isenberg, Joan P., Ed.D., Rutgers University, 1978; Associate Professor
Jacob, Evelyn J., Ph.D., University of Pennsylvania, 1977; Associate Professor
Jones, Edward, Ed.D., Virginia Polytechnic Institute and State University, 1977; In-Service Education Coordinator; Associate Professor
Jones, Julie K., Ph.D., University of Pittsburgh, 1978; Assistant Professor
Martin, William R., Ph.D., University of Minnesota, 1968; Professor
Montebello, Mary S., Ph.D., Ohio State University, 1964; Professor
Raines, Shirley C., Ed.D., University of Tennessee, 1979; Associate Professor
Sears, Carol J., Ph.D., The American University, 1976; Associate Professor
Smith, Donald F., Ed.D., The American University, 1968; Associate Professor
Spikell, Mark A., Ed.D., Boston University, 1972; Professor
Valero-Figueira, Eda, Ph.D., University of Michigan, 1978; Assistant Professor
White, Charles, Ph.D., Indiana University, 1985; Assistant Professor

Master of Education Programs, M.Ed.

The Department of Curriculum and Instruction offers the Master of Education degree in the following fields: elementary education, reading, secondary education, and special education.

Students holding the baccalaureate degree or a graduate degree who wish to take courses toward certification or endorsement should apply for nondegree status in the Graduate School. For additional information contact the Department of Curriculum and Instruction.

Program Approval and Accreditation

All of the graduate programs listed above have been approved by the State Department of Education and are accredited by the Southern Association of Colleges and Schools and by the National Council for the Accreditation of Teacher Education.

Admission Requirements

In addition to fulfilling the Graduate School admission requirements, the applicant must:

1. Meet specific requirements for the program desired; the admission requirements for each program are shown in the following pages. Students admitted provisionally because of low grade-point averages normally will be required to demonstrate academic skills by taking courses in Introductory and foundations courses in the program before being considered for admission as degree students.

2. If seeking graduate course work in teacher education, possess a temperament appropriate for the teacher as required by Virginia Certification Regulations.

Degree Requirements

In addition to fulfilling the Graduate School degree requirements, all candidates must:

1. Complete foundation requirements in the three areas listed below. Each student, with adviser, should select courses that will broaden knowledge in those fields upon which professional activities are based. The following outline may serve as a guide:

Area I, Foundations of Education, EDUC 521 (2) Area II, one two-semester-hour course in specialized foundational studies. Select from EDUC 502, 503, 504, 509, 510, 523, 524, 529, 530 Area III, Research: EDRS 590

2. Complete the number of semester hours and course requirements for the graduate program in which enrolled.
3. Pass a comprehensive examination (where required) covering the graduate program in which enrolled. The comprehensive examination given at the conclusion of each student’s program will be broadly conceived. Therefore, the student should support with independent reading those areas not chosen for course work.

Students having an interest in research may elect a program requiring the preparation of a thesis. Students electing a thesis in lieu of a comprehensive examination must include within the requirements for their program the following courses:

EDUC 590, 591, and 599.

Program Requirements

It is each student’s responsibility to be aware of all requirements and to develop with the assigned adviser a program that will meet the requirements. The program should be developed as soon as possible after the student is admitted to degree status. The typical programs that appear for each degree are offered as examples.

The following programs require a practicum or internship: reading and special education. Students should apply for practicum or internship one semester prior to enrollment and observe the following application deadlines:

- March 15 for fall semester
- September 15 for spring semester
- February 15 for summer session

Application forms are available in the Office of Professional Education Services in the Department of Curriculum and Instruction and must be returned to the student’s adviser.

Computer Names

Names provided for specialized courses in the four M.Ed. programs offered in the Department of Curriculum and Instruction are:

EDCI Elementary/Secondary Curriculum and Instruction
EDRD Reading
EDSE Special Education

Other education courses (including foundations, research and support courses) are prefixed EDUC. Prerequisites pertaining to each course are listed with the course descriptions in this catalog.

Elementary Education

The Master of Education Program in elementary education is designed to improve the competence of teachers working with children at the pre-elementary, lower elementary, and upper elementary levels.

Areas of Specialization

Each candidate may select one of the following areas of specialization:

- Curriculum and Instruction (9 hours)
- Pre-elementary (9 hours)
- Bilingual/Multicultural (12 hours)
- Instructional Applications of Microcomputers (15 hours)

Admission Requirements

Students preparing for the pre-elementary specialization (infancy-kindergarten) must:

1. Possess a baccalaureate degree.
2. Submit evidence of three years of acceptable teaching or administrative experience in a preschool or elementary school program. (This requirement is waived for students who can provide evidence of certification in elementary education by the state of Virginia or another jurisdiction.)
3. Submit recommendations by three persons qualified to judge the candidate’s professional competence.

Students preparing for the elementary curriculum and instruction and bilingual/multicultural specializations must:

1. Provide evidence of certification in elementary education by the state of Virginia or another acceptable jurisdiction.
2. Submit recommendations by three persons qualified to judge the candidate’s professional competence.

Students interested in the Instructional Applications of Microcomputers specialization will find admission requirements under the program description for Instructional Applications of Microcomputers.

Degree Requirements

In addition to the departmental degree requirements, students must take 6 hours of basic concentration courses, 9-15 hours in an area of specialization, and additional course work to meet the degree total of 30 semester hours. Normally, students are required to take as the basic concentration EDUC 596, and EDUC 650 and 782 (EDCI 782 is usually offered only in the spring term). In addition, students normally take hours in one of the following specializations:

- 1. Pre-elementary education (infancy–kindergarten): EDCI 511, 512, 513 or 514
- 2. Curriculum and instruction: EDCI 657, 658, 660, 661, 663, 666, EDGC 624, EDRD 559 or EDUC 565
- 3. Bilingual/Multicultural (see Bilingual/Multicultural Education section)
- 4. Instructional Applications of Microcomputers (see Instructional Applications of Microcomputers section)

Secondary Education

The Master of Education program in secondary education is designed to improve the competence of teachers who have completed a basic program in preparation for teaching and who hold a Virginia certificate or its equivalent. Teaching fields available for study are biology, business, chemistry, economics, English, French, German, government, history, mathematics, psychology, physical education, physics, science, social studies, Spanish, and vocational education.

Areas of Specialization

Each candidate may select one of the following areas of specialization:
### Areas of Study

<table>
<thead>
<tr>
<th>Curriculum and Instruction (12 hours)</th>
<th>Individual’s prior preparation in general education and in the chosen teaching discipline.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bilingual/Multicultural (12 hours)</td>
<td></td>
</tr>
<tr>
<td>Instructional Applications of Microcomputers (15 hours)</td>
<td></td>
</tr>
<tr>
<td>Vocational Education (15 hours)</td>
<td></td>
</tr>
</tbody>
</table>

### Degree Requirements

**Certification Components**
- Admission requirements: Students must meet the general admission requirements of the Graduate School. In addition, students must have an approved Plan of Study of course work needed for certification.
- Admission to the Teacher Education Program for Students Seeking Secondary Education Certification

#### Secondary Education Certification Program

Students who wish to be certified in a secondary school discipline must apply as degree students and complete a graduate-level certification program as outlined by the certification specialists in the College of Education and Human Services (323–2400). They must also complete the general education and discipline courses they need to meet GMU certification program requirements. These courses may either be undergraduate or graduate courses.

Students who wish to earn a Master of Education degree in Secondary Education must complete 17 hours beyond the certification requirements for a total of 47 hours. This total includes 12 hours of practicum, which is the student teaching experience. The total number of hours any given student will complete is dependent upon the

### Admission Requirements

Applicants for Secondary Curriculum and Instruction, Bilingual/Multicultural, and Vocational Education specialties must:

1. Provide evidence of certification in secondary education by the state of Virginia or another jurisdiction:
2. Submit recommendations by three persons qualified to judge professional competence.

Students interested in the Instructional Applications of Microcomputers specialization will find admission and degree requirements in another part of the catalog.

### Degree Requirements

In addition to the departmental degree requirements, students must take 6 hours of basic concentration courses, 12–15 hours in an area of specialization, and additional course work to meet the degree total of 30 semester hours. Normally, students are required to take as the basic concentration EDUC 596, EDCI 652, and EDCI 783 (EDCI 783 is usually offered only in the fall term). In addition, students normally take hours in one of the following specialties:

1. **Curriculum and Instruction**: Nine hours of coursework in the teaching field or a related discipline and one of the following as related to the teaching field: EDCI 587, 569, 572, 573, EDRD 614, 615, or EDUC 565.
2. **Bilingual/Multicultural** (see appropriate catalog section)
3. **Vocational Education** (see appropriate catalog section)
4. **Instructional Applications of Microcomputers** (see appropriate catalog section)

### Deadlines

Completed and signed application forms must be submitted to the Office of Professional Education Services by January 1, March 15, August 1, or November 1 of the semester preceding that in which all prerequisites have been met.

### Academic Requirements

1. Admission as a degree or non-degree student in the Graduate School.
2. The student must be in good academic standing in accordance with the policies of the Graduate School.
3. A minimum professional GPA of 2.75. To qualify for a Professional GPA the student must have completed EDUC 510, 522, and 524.

### Proficiency Exams

1. Submission of scores for the General Knowledge and Communications Skills components of the National Teachers Exam (NTE) that meet the minimum standards for teacher certification in Virginia.
2. Successful demonstration of proficiency in written English and computer literacy.
3. Completion of a panel interview as scheduled through the Office of Professional Educational Services.

### Retention in Teacher Education Programs

Upon admission to teacher education programs, the student’s progress and development as a teacher will be monitored by the Coordinator of the Office of Professional Education Services and the Curriculum and Instruction Department faculty.

---

http://catalog.gmu.edu
Should a student's qualifications fall below the required level, admission status will be revoked until such time as the student presents appropriate evidence that these deficiencies have been remedied.

Academic Requirements
Requirements for retention are:
1. Continued academic performance at or above the admission requirement standards.
2. Courses included in the computation of the professional GPA will include all courses taken through the Department of Curriculum and Instruction or accepted by the department for transfer credit.

Suitability for Teaching
Continued demonstration of suitability for teaching as stated in the admission requirements. Special focus will be placed on the student's performance in methods courses and related field experiences.

Admission to Student Teaching
In addition to having maintained all teacher education program requirements for admission and retention, students must make application and be accepted for placement in student teaching.

Students must recognize that the semester prior to student teaching is critical. Academic or performance deficiencies (i.e., incompletes, graduation deficiencies) may preclude student teaching.

Requirements for admission to student teaching are:

Deadlines
Filing of applications for student teaching in the Office of Professional Education Services by February 10 for the fall semester and September 10 for the spring semester.

Academic Requirements
1. Completion of all degree or program requirements, except for student teaching, as determined by the student's graduation catalog or plan of study.
2. No grade below C in any professional sequence course.

Suitability for Teaching
Completion of an interview scheduled through the Office of Professional Education Services resulting in a recommendation for admission to student teaching from the coordinator of Professional Education Services. In cases of denial, a review will be presented to the TESC for action in accordance with committee policy.

Education Courses
1. EDUC 522 Introduction to Secondary Education (3)
2. EDUC 510 Human Development (Adolescence-Adulthood) (2) and EDUC 524 Learning Theory (2)
3. EDUC 529 Pluralism in U.S. Education (2)
4. EDRS 531 Educational Tests and Measurements (3)
5. EDUC 593 Utilization of Instructional Technology (3)
6. Curriculum and Methods. Select one from the following:
   EDCI 567 Social Studies
   EDCI 569 English
   EDCI 572 Math
   EDCI 573 Science
   EDCI 550 Foreign Language
   EDCI 519 English as a Second Language
Prerequisites: Courses in Areas 1, 2, 3 and 4
7. Practicum
   EDCI 515 Practicum in Secondary Education (12)
Total Hours: 30

M.Ed. Component
Degree Requirements in Addition to the Education Courses in the Certification Component:
1. Courses:
   EDUC 521 Foundations of Education (2)
   EDRS 590 Educational Research (3)
   EDCI 652 Curriculum Development in the Secondary School (3)
   EDCI 783 Seminar in Secondary School Teaching (3)
   Approved Electives. [Students must select, with adviser's approval, at least six graduate credits from one of the following areas: (a) the Instructional Applications of Microcomputers; (b) the Northern Virginia Writing Project; (c) Advanced Study in a Discipline; (d) Bilingual/Multicultural Education.]
Total Hours (17)
Comprehensive Exam or Master's Thesis

Bilingual/Multicultural Education
Students in either the elementary or secondary M.Ed. program may specialize in bilingual/multicultural education. Twelve hours are required in the specialization:
EDCI 517 Introduction to Bilingual Education (3)
EDCI 518 Introduction to Multicultural Education (3)
EDCI 519 Methods of Teaching in Bilingual/English-as-a-Second-Language Settings (3)
One of the following electives (3):
EDUC 506, EDUC 532, EDCI 520, EDRD 615, or a linguistics course.

This specialization is designed for all teachers who work with students of limited English proficiency. Fluency in a language other than English is not required. Financial aid is available for students bilingual in English and a minority language of the public school population in this metropolitan area.
English as a Second Language

Students in either the elementary or secondary M.Ed. program may specialize in teaching English as a second language. Interested students should consult an adviser in the Bilingual/Multicultural Education Center in the Department of Curriculum and Instruction.

Instructional Applications of Microcomputers

Students in either the elementary or secondary master of education programs may complete a specialization in the Instructional Applications of Microcomputers. This two-track specialization is designed to enable students to assume school-based leadership roles in incorporating microcomputers in the instructional programs of elementary and secondary schools (school computer coordinator track) and to prepare students to teach advanced placement computer science and related courses at the high school level (computer science education track).

Admission Criteria and Procedures

Criteria. Applicants must meet the general requirements for admission to the M.Ed. programs in elementary and secondary education. In addition, applicants must document (1) their ability to communicate effectively in writing, and (2) their understanding of the application of this specialization to their work situation.

Procedures. In addition to the regular application for admission to the M.Ed. program in elementary and secondary education, applicants must complete an essay relating to one of the IAM tracks. For the SCC track, the essay should address the following issues: (1) the nature of computer literacy—present and defend a definition; (2) experiences relative to the program; (3) the knowledge you want to gain from this program; and (4) how you envision using computers in your classroom. For the CSE track, the essay should address (2) and (3) above, plus the following: How teaching high school computer science is consistent with the purposes of pre-college education. An interview with the IAM coordinator may also be required for both tracks; an interview with a Computer Science Department faculty liaison is required for the latter track.

Priority will be given to classroom teachers, or those who will have an impact on classrooms, at the elementary and secondary school levels.

Transfer students. Students who apply to transfer from a GMU M.Ed. program to the IAM program must meet the same requirements as new applicants.

Specialization Requirements

School Computer Coordinator (SCC) track. In addition to general degree requirements, students must take 8 hours of basic concentration courses (EDCI 705, 596, and either 782 or 783) and 15 hours of specialization courses: One course selected from EDCI 519, 550, 567, 569, 572, 573, 620, 657, 658, 663, 666, EDUC 593, or EDRD 559 and all of the following: EDCI 530, 532, 630, and 730.

Vocational Education

Students in the M.Ed. in Secondary Education Program may specialize in vocational education. This specialization is designed to meet the needs of persons with a background in such areas as technology education, occupational education, business and office education, general vocational education, special needs education, cooperative education, adult education, and home economics education.

The Master's Degree in Secondary Education with a specialization in vocational education requires 32 semester hours as follows:

Educational Foundations:
EDUC 515 History and Philosophy of Vocational Education (3)
EDUC 521 Foundations of Education (2)
EDRS 590 Education Research (3)

Vocational Core:
EDAS 631 Supervision of Instruction (3)
EDUC 682 Curriculum in Vocational Education or EDUC 631 Organization and Administration in Vocational Education

Vocational Specialization:
EDUC 688 Internship (3 or 6)
EDUC 783 Seminar (3)
Electives (6 to 9)

Interested persons should consult the Vocational Education Office in the Department of Curriculum and Instruction.

Northern Virginia Writing Project

This Project, a cooperative effort between the Departments of English and Curriculum and Instruction, has developed several courses which students may use as part of the specialization requirement within the elementary or secondary M.Ed. program. These courses are:
EDUC 695 NVWP In-SERVICE Program
EDUC 696 NVWP Research Seminar
EDUC 697 NVWP Writing Theory Seminar

Teachers who have completed the project’s six–semester–hour summer institute may also use this as part of their degree requirements.

Reading

The Master of Education program in Reading is designed to permit qualified candidates to become reading specialists or reading teachers at the elementary or secondary levels. Federal Grants: Chapter 1—Reading teachers, adult education teachers, and administrators of private reading programs. The program meets the standards established by the Virginia State Department of Education and the International Reading Association. Direct involvement with youths and adults is provided through assignments within individual courses. Practicum provides candidates the opportunity to put into practice the techniques and methods learned in individual courses. The
Educational Study Center at the University is used as the practicum site. The program is undergoing some modification; see program faculty for detailed information.

Admission Requirements
Applicants to the M.Ed. program in reading must:
1. Provide evidence of certification at the collegiate professional level by the State of Virginia or another jurisdiction;
2. Have completed two years of successful teaching experience;
3. Be recommended by three professional educators in the position of principal, supervisor, or administrator, including at least one who has observed the applicant's teaching.

Exceptions to the first two admission requirements may be made with the approval of the department chair for applicants seeking to work with adults.

Degree Requirements
The master's degree in reading requires 36 semester hours as follows:
Departmental Foundations Courses (7 semester hours)
EDRS 590 Education Research (3)
EDUC 521 Foundations of Education (2)
Other Foundations course (2)
Common Core Courses (15 semester hours)
EDRD 611 Remedial Reading (3)
EDRD 613 Diagnostic and Evaluative Techniques in Reading (3)
EDSE 552 Language Development and Disorders (3)
EDRD 790 Practicum in Reading (6)
Specialization requirements (select area of specialization) (9 semester hours)
For reading teacher:
EDRD 559 Teaching Developmental Reading in the Elementary School (3)
EDRD 614 Teaching Reading in the Secondary School (3)
EDCI 657 Teaching Language Arts in the Elementary School (3) OR
EDCI 569 Teaching English in the Secondary School (3)
For reading specialist:
EDRD 559 Teaching Developmental Reading in the Elementary School (3)
EDRD 618 Organization and Administration of Reading Programs (3)
EDRD 614 Teaching Reading in the Secondary School (3)
Electives 5-11 semester hours
EDRD 615 Teaching Reading in Multicultural/Multilingual Settings (3)
EDRD 616 Teaching Reading to Adults (3) and other approved courses.
Selected in conjunction with advisers from list of specialization courses or other relevant courses.
Total: 36 semester hours
Applicants seeking to take selected courses for endorsement or professional development, not for degree, may apply as nondegree students. These applicants are required to provide evidence of successful completion of a baccalaureate degree and should generally have an undergraduate grade point average of at least 2.75.

Special Education
The Master of Education degree in Special Education is designed to enable qualified individuals to become specialists in:
1. Learning Disabilities (LD)
2. Emotional Disturbance (ED)
3. Early Childhood Handicapped (ECH)
4. Severely and Profoundly Handicapped (SPH)
5. Bilingual/Multicultural Special Education (BMSE)
6. Special Education Technology (SET)
7. Gifted and Talented Education (GTE)

Admission Requirements
Applicants for the M.Ed. degree in Special Education must:
1. Meet the general admissions requirements of the Graduate School;
2. Submit recommendations by three persons qualified to judge the applicant's professional competence;
3. Submit a written autobiographical narrative;
4. Be interviewed and recommended for acceptance;
5. Additional requirements vary according to the area of specialization.

Degree Requirements
A total of 33-46 graduate credit hours are required depending upon previous course work.

Programs in Early Childhood Handicapped, Severely and Profoundly Handicapped
1. For ECH and SPH, applicants must:
a. Provide evidence of successful completion of baccalaureate degree in a human services area such as education, psychology, sociology, or allied health services;
b. Provide evidence of work-related experiences with severely handicapped individuals;
c. Complete or have completed a course in survey of special education or its equivalent.
2. Completion of program course work in ECH and SPH will allow the student to meet endorsement requirements. Initial state certification can be obtained while seeking endorsement.

Early Childhood Handicapped (ECH)
Prior to state endorsement in preschool handicapped, graduates of the Early Childhood Handicapped program must possess Collegiate Professional certification and have completed two years of experience as an elementary or special education teacher.
**ECH Course Requirements**

- EDSE 551 Classroom Management: Theory and Practice (3)
- EDSE 552 Language Development and Disorders (3)
- EDSE 622 Augmentative Communication (2)
- EDSE 647 Medical and Health Aspects of Handicapping Conditions (3)
- EDSE 648 Introduction to Psychoeducational Assessment (2 or 3)
- EDSE 649 Clinical Psychoeducational Assessment in Special Education (3)
- EDSE 659 Curriculum and Methods ECH (3)
- EDSE 665 Family Intervention Programs for Handicapped Children (3)
- EDSE 669 Transdisciplinary Approaches to Rehabilitation (2)
- EDSE 782 Comprehensive Topics in Special Education: Trends and Issues (2)
- EDSE 790 Internship in Special Education (3-6)
- EDUC 514 Administering and Supervising Pre-Elementary Education (3)
- EDUC 509 or EDUC 510 Human Development (2)
- EDUC 521 Foundations of Education (2)
- EDRS 590 Education Research (3)

**Severely and Profoundly Handicapped (SPH)**

Prior to state endorsement in SPH, candidates must have or qualify for Professional Certification or its equivalent.

**SPH Course Requirements**

- EDSE 551 Classroom Management: Theory and Practice (3)
- EDSE 552 Language Development and Disorders (3)
- EDSE 620 Advanced Applied Behavior Analysis and Social Learning Theory (3)
- EDSE 622 Augmentative Communication (2)
- EDSE 647 Medical and Health Aspects of Handicapping Conditions (3)
- EDSE 648 Introduction to Psychoeducational Assessment (2 or 3)
- EDSE 649 Clinical Psychoeducational Assessment in Special Education (3)
- EDSE 661 Curriculum and Methods SPH (3)
- EDSE 688 Vocational and Leisure Education for Severely Handicapped (2)
- EDSE 669 Transdisciplinary Approaches to Rehabilitation (2)
- EDSE 782 Comprehensive Topics in Special Education: Trends and Issues (2)
- EDSE 790 Internship in Special Education (3-6)
- EDUC 509 Human Development (2)
- EDUC 521 Foundations of Education (2)
- EDUC 529 Pluralism in U.S. Education (2)
- EDRS 590 Education Research (3)

**Programs in Special Education Technology (SET)**

1. SET applicants must meet at least one of the following prerequisites:
   a. Possess an undergraduate or graduate degree in special education;
   b. Provide evidence of Virginia State endorsement in special education, or its equivalent; or
   c. Have successfully completed (a) a course in the survey of special education, or its equivalent. (2) a characteristics course in a specific special education category, and (3) a curriculum and methods course in the same category. Additional courses may be required to meet prerequisite requirements for special education course work.

2. SET students must also complete seven hours of graduate credit selected (with adviser's approval) from the following courses:
   - EDSE 551 Classroom Management: Theory of Practice (3)
   - EDSE 553 Teaching Remedial Mathematics (2 or 3)
   - EDSE 554 Adaptive Methods in Education (2)
   - EDSE 648 Introduction to Psychoeducational Assessment (2 or 3)
   - EDSE 655 Curriculum and Methods—Emotional Disturbances/Learning Disabilities (3)
   - EDSE 659 Curriculum and Methods ECH (3)
   - EDSE 661 Curriculum and Methods SPH (3)

b. Teaching of mathematics

c. Human growth and development
d. Survey of special education or equivalent

2. Completion of program course work in the areas of ED and LD will allow the student to meet state endorsement requirements. Initial state certification can be obtained while seeking endorsement.

3. Students wishing dual endorsement will take all of the following courses. Those wishing only ED may omit EDSE 620. Those wishing only ED may omit EDSE 649.

**ED/LD Course Requirements**

- EDSE 544 Vocational and Continuing Educational Aspects of the Academically Handicapped (1)
- EDSE 551 Classroom Management: Theory and Practice (3)
- EDSE 552 Language Development and Disorders (3)
- EDSE 553 Teaching Remedial Mathematics (2 or 3)
- EDSE 554 Adaptive Methods in Education (2)
- EDSE 620 Advanced Applied Behavior Analysis and Social Learning Theory (3)
- EDSE 644 Characteristics of Students with Emotional Disturbances and Learning Disabilities (3)
- EDSE 648 Introduction to Psychoeducational Assessment (2 or 3)
- EDSE 649 Clinical Psychoeducational Assessment in Special Education (3)
- EDSE 655 Curriculum and Methods—Emotional Disturbances/Learning Disabilities (3)
- EDSE 782 Comprehensive Topics in Special Education: Trends and Issues (2)
- EDSE 790 Internship in Special Education (3-6)
- EDUC 521 Foundations of Education (2)
- EDUC 529 Pluralism in U.S. Education (2)
- EDRS 590 Education Research (3)

**Programs in Special Education Technology (SET)**

1. SET applicants must meet at least one of the following prerequisites:
   a. Possess an undergraduate or graduate degree in special education;
   b. Provide evidence of Virginia State endorsement in special education, or its equivalent; or
   c. Have successfully completed (a) a course in the survey of special education, or its equivalent. (2) a characteristics course in a specific special education category, and (3) a curriculum and methods course in the same category. Additional courses may be required to meet prerequisite requirements for special education course work.

2. SET students must also complete seven hours of graduate credit selected (with adviser’s approval) from the following courses:
   - EDSE 551 Classroom Management: Theory of Practice (3)
   - EDSE 553 Teaching Remedial Mathematics (2 or 3)
   - EDSE 554 Adaptive Methods in Education (2)
   - EDSE 648 Introduction to Psychoeducational Assessment (2 or 3)
   - EDSE 655 Curriculum and Methods—Emotional Disturbances/Learning Disabilities (3)
   - EDSE 659 Curriculum and Methods ECH (3)
   - EDSE 661 Curriculum and Methods SPH (3)
3. Additionally, three hours of instructional technology electives are required, selected (with adviser’s approval) from the following courses as needed in addition to the program requirements listed below:

EDUC 699 Computer Applications in Education (3)
EDUC 752 Seminar in Instructional Applications of Computers (3)
EDUC 754 Seminar in Computers for Educational Administration and Research (3)
EDCI 532 Programming Microcomputers in LOGO for Instructional Applications (3)

SET Course Requirements

EDUC 517 Computer Applications for Special Populations (4)
EDUC 521 Foundations of Education (2)
EDUC 529 Pluralism in U.S. Education (2)
EDRS 590 Educational Research (3)
EDCI 530 Programming Microcomputers in BASIC for Instructional Applications (3)
EDCI 630 Supervising and Organizing Instructional Uses of Microcomputers (3)
EDCI 705 Instructional Design (3)
EDCI 730 Designing Learning Activities for Microcomputers (3)
EDSE 622 Augmentative Communication (2)
EDSE 790 Internship in Special Education (2)

Programs in Bilingual/Multicultural Special Education (BMSE)

BMSE is taken in conjunction with any of the other four areas of specialization. Specific requirements include those of the chosen specialization (LD, ED, ECH, SPH) and at least one additional course (Including EDUC 532: Bilingualism and Language Acquisition Research).

Program in Gifted and Talented Education

In addition to the general admission requirements for graduate school and entry into the Curriculum and Instruction Department, applicants must be interviewed. Contact the department regarding materials that must be brought to this interview.

GTE Course Requirements

EDUC 509 Human Development: Infancy to Middle Childhood (2) or
EDUC 510 Human Development: Adolescence through Adulthood (2)
EDUC 523 The Exceptional Child in American Education (2)
EDUC 524 Learning Theory (2)
EDUC 529 Pluralism in U.S. Education (2)
EDRS 590 Educational Research (3)
EDCI 620 Teaching Thinking Skills (3)
EDSE 670 Introduction to Gifted and Talented Education (3)
EDSE 671 Special Topics in Education of Exceptional Children (any three of the following):
   a. Counseling the Gifted (1)
   b. Identification and Evaluation in Gifted Education (1)
   c. Legislation Related to Gifted and Talented Education (1)
   d. Creative Methods of Solving Problems (1)

EDSE 672 Models and Methods of Teaching Gifted and Talented Education (3)
EDSE 673 Curriculum Design and Research in Gifted and Talented Education (3)
EDSE 674 Seminar in Gifted and Talented Education (3)
EDSE 782 Comprehensive Topics in Special Education (2)
EDSE 790 Internship in Special Education (6)

Additional GTE Requirements

At least six hours of supporting course work are required in science, mathematics, humanities, or computer technology.

Elementary/Secondary Education Courses (EDCI)

500 See EDUC 500.

507 Internship in Applied Linguistics (3:0:3). Prerequisites Graduate standing in the Education or English Department and EDCI 519 or ENGL 521 (ESL methods course). Internship requires 100 hours completed over at least a five-week period for three hours of credit. Internship provides practical experience in the field of English as a Second Language and Applied Linguistics as, e.g., teacher, administrator, counselor, or researcher. For placement, consult instructor before semester starts.

511 Preparing the Pre–Elementary Environment (3:3:0). Study of procedures, materials, and organization of environments for young children (infancy-kindergarten). Field experiences required for students without previous teaching or administrative experience at the pre-elementary levels.

512 Home–School Relations in Pre–Elementary Education (3:3:0). Examination of patterns and problems of family life for the purpose of improving communication between teachers and parents.

513 Play as a Growth Process in Pre–Elementary Education (3:3:0). Focus on play as an approach to teaching and learning; examined as an intellectual, social, and emotional function in children’s development.

514 Administering and Supervising Pre–Elementary Education (3:3:0). Examines programs and techniques relating to the administration and supervision of pre–elementary education programs. Emphasis on the director’s role in staff recruitment, hiring, development, and evaluation. Leadership and management techniques.

515 Practicum in Secondary Education (12:0:12). Prerequisites Admission to and completion of all additional course work in the secondary education certification program, admission to and good standing in the Teacher Education Program, and/or permission of instructor and adviser. An intensive, supervised clinical experience of a full semester in an approved school in Virginia. Experience at the secondary level. Participation in scheduled group sessions required.

http://catalog.gmu.edu
517 Introduction to Bilingual Education (3:3:0). Analysis of concepts, principles, and issues of bilingual education: its present status, and its future direction. Focus on current programs and their relationship with curricula in English as a second language.

518 Introduction to Multicultural Education (3:3:0). A survey of multicultural education that examines problems faced by an individual in an alien culture, theories of bilingual/multicultural education, relationships between nonverbal communication and language systems, and interpersonal skills needed for encouraging harmony between our dominant culture and minority ethnic communities.

519 Methods of Teaching in Bilingual/English-as-a-Second-Language Settings (3:3:0). Examination of past and current methods and techniques for teaching English as a Second Language (ESL) in bilingual/ESL classrooms. Students analyze all program models and methods of instruction for students of limited English proficiency; practice teaching strategies based on recent second language acquisition research; and examine materials, textbooks, and resources available in the field. This course includes a field experience component and meets Virginia certification requirements for ESL teachers.

520 Assessment and Curriculum Development in Bilingual/English-as-a-Second-Language Settings (3:3:0). Examination of issues in testing students of limited English proficiency and development of curricular materials for bilingual English-as-a-Second-Language classrooms. Analysis of testing for placement, diagnosis, entry-exit criteria and evaluation; and examination of sources and models of curriculum development for bilingual/ESL classrooms.

530 Programming Microcomputers in BASIC for Instructional Applications (3:3:0). Students will learn the fundamentals of operating a microcomputer. The major focus of the course will be learning to use the BASIC language to program microcomputers for instructional applications.

532 Programming Microcomputers in LOGO for Instructional Applications (3:3:0). Prerequisite EDCI 530 or permission of instructor. Students will learn how to write and use programs in LOGO, an interactive programming language used in schools. They will create microcomputer activities which develop problem-solving skills and programming skills.

550 (formerly EDUC 450) Teaching Foreign Languages in the Secondary School (3:3:0). Study of theories and methods of foreign language teaching, with practical application to the classroom. Field experience required for those seeking initial teacher certification. Fall semester only.


600 See EDUC 600.

620 Teaching Thinking Skills Across the Curriculum (3:0:0). Through lecture, discussion and demonstration, students design, analyze, apply and evaluate a range of approaches to teaching thinking skills and strategies in grades K-12. Application to selected subject matter is stressed.

630 Supervising and Organizing Instructional Uses of Microcomputers (3:3:0). Prerequisite EDCI 530 or permission of instructor. Teachers will do some programming; develop criteria for selecting microcomputer hardware; learn to choose and evaluate available software; and study, analyze and develop procedures for organizing and managing the use of microcomputers in schools.

650 Curriculum Development in the Elementary School (3:3:0). Study of development of the curriculum in the pre-elementary, elementary levels; historical backgrounds; present programs; development of new programs; methods of implementing new programs; and evaluative methods and procedures.

651 Curriculum and Instruction in the Middle School (3:3:0). Study of development of curriculum in the middle school grades; historical backgrounds, present programs; development and implementation of new programs; program evaluation; instructional and organizational implications.

652 Curriculum Development in the Secondary School (3:3:0). Study of development of the curriculum in the secondary school; historical backgrounds, present programs; development of new programs; methods of implementing new programs; and evaluative methods and procedures.

657 Teaching Language Arts in the Elementary School (3:3:0). Study of methods, curricula, current issues and research literature in English-language arts programs of the elementary school. Emphasis on recent innovations in methodology and traditional concerns of the communication arts.

658 Teaching Social Studies in the Elementary School (3:3:0). Prerequisite Course in teaching social studies in the elementary school. Study of methods, materials, content and organization of social studies programs in the elementary school.
660 The Diagnostic Teaching of Reading in the Elementary School (3:3:0). Prerequisite Course in reading. Use of diagnostic techniques, diagnostic instruments and evaluation to individualize the reading instruction in the classroom. Primarily designed for classroom teachers.


663 Teaching Science in the Elementary School (3:3:0). Prerequisite Course in teaching science in the elementary school and/or permission of instructor. An advanced course in the methodology and materials involved in the teaching of the biological, physical and earth sciences.


701 Educational Program Development (3:3:0). Prerequisite Completion of student teaching or a bachelor’s degree from an accredited undergraduate institution. Analysis and application of principles and procedures essential to the planning, design, testing, evaluation, revision and implementation of instructional programs for use in schools, community colleges, public agencies, museums and business settings. Studies selected theory, research and exemplary practice regarding program development, and investigates alternative strategies for developing instructional programs.

705 Instructional Design (3:3:0). Prerequisite Bachelor’s degree from an accredited institution: teaching experience. Analysis, application and evaluation of the principles of instructional design to develop and evaluate narrative texts, programmed drill, and practice materials, tutorial modules and simulations. Attention is given to materials designed to develop problem solving skills.

730 Designing Learning Activities for Microcomputer (3:3:0). Prerequisites EDCI 530 and EDCI 705. Students will design, write, implement and evaluate microcomputer learning activities and ancillary materials for microcomputers.

782 Seminar in Pre-Elementary and Elementary School Teaching (3:3:0). Prerequisite Student must have completed graduate program except for seminar, or permission of department. Application of graduate course work to instructional situations through discussion, projects and reports related to practice and/or research.

783 Seminar in Secondary School Teaching (3:3:0). Prerequisite Student must have completed graduate program except for seminar, or permission of department. Application of graduate course work to instructional situations through discussion, projects and reports related to practice and/or research.

Reading Education Courses (EDRD)

500 See EDUC 500.


600 See EDUC 600.

611 Remedial Reading (3:3:0). Prerequisite EDRD 559 or 614. Includes nature and causes of reading difficulties, organization of remedial reading programs, use of remedial techniques, teacher aids and learning centers, psychological and health services, and innovative methods and materials.

613 Diagnostic and Evaluative Techniques in Reading (3:3:0). Prerequisite Admission to graduate program in reading, EDRD 611 or 612 and permission of adviser. Technical diagnosing of reading problems. Procedures in testing, scoring, and evaluating standardized and informal tests, individual and group tests, physical and psychological tests, and techniques of reporting test results.

614 Teaching Reading in the Secondary School (3:3:0). Emphasis on reading in content areas; reading problems: causes, diagnosis, remediation; skills and speed reading.

615 Teaching Reading in Multicultural/Multilingual Settings (3:3:0). Develops competencies in teaching methods for students from multicultural or multilingual backgrounds. Emphasis on increasing the teacher’s knowledge and understanding related to effective reading instruction. Particular emphasis on issues, methods, techniques, innovative designs for teaching, problem areas, linguistic differences, prereading skills, and the psychological development of the child.

616 Teaching Reading to Adults (3:3:0). Includes history of adult education, assessment techniques, and reading methods and materials that meet the special needs of adult students.

617 Teaching Reading to the Gifted (3:3:0). Prerequisite EDRD 559 or 614. Study of higher levels of reading attainment: speed reading, critical reading, advanced study skills, intellectual needs of the gifted, and literature and materials for enrichment programs.

618 Organization and Administration of Reading Programs (3:3:0). Prerequisites EDRD 559 or 614, EDRD 611, EDRD 613 or permission of instructor. Designed to examine the roles of administrative staff and resource personnel in reading programs. Emphasis on the roles of reading administrators (consultants, specialists or language arts supervisors), the organization and implementation of reading programs and services, a review and analysis of management techniques, and the development of skills necessary to implement reading programs.

790 Practicum in Reading (3-6:0:0). Prerequisites Admission to and completion of the graduate program in reading except for practicum, or enrollment in the final semester of the program, and permission of adviser. Supervised practice in
Areas of Study

the Educational Child/Youth Study Center, work with individuals and small groups using a variety of reading procedures. Participation in scheduled group sessions required.

794 Internship in Reading (3:3:0). Prerequisites Admission to and completion of graduate program in reading except for practicum, or enrollment in the final semester of the program, and permission of adviser. Supervised teaching and participation as a reading specialist in a public school system. Participation in scheduled group sessions required.

Special Education Courses (EDSE)

500 See EDUC 500.

544 Vocational and Continuing Educational Aspects of the Academically Handicapped (1:1:0). Primarily a lecture course designed to explore factors for developing vocational independence in individuals with disabilities and/or limited English proficiency.

551 Classroom Management: Theory and Practice (3:3:0). Focus on identifying, recording, changing, and evaluating social and academic behaviors. Theories of classroom management are explored and various approaches to management are practiced. Development of individual education programs emphasized. Field experiences required.


554 Adaptive Methods in Education (2:2:0). Prerequisite EDUC 523. Students apply theory to practice as they adapt different levels of general education curriculum to accommodate various learning needs. Emphasis is placed on adaptation of materials, intervention methods, and the development of an ongoing system for evaluation of student progress.

600 See EDUC 600.

620 Advanced Applied Behavioral Analysis and Social Learning Theory (3:3:0). Prerequisites Graduate standing and permission of adviser. Focus on recording and analyzing behaviors for application of theory to develop techniques which increase learning by handicapped students.

622 Augmentative Communication (2:2:0). Prerequisites Graduate standing, EDSE 552 (can be corequisite) and permission of adviser. Focus on alternative language and communication techniques for children with severe language and speech impairments.

644 Characteristics of Students with Emotional Disturbances and Learning Disabilities (3:3:0). Study of manifestations of learning and behavioral differences and their impact on academic and social performance. Theories of deviance and learning styles as they relate to emotional disturbances and learning disabilities are presented. Field experiences required.

647 Medical and Health Aspects of Handicapping Conditions (3:3:0). Prerequisite EDUC 523 or permission of adviser. Nature and causes of disabling and/or special health conditions. Examines screening and evaluation techniques, treatment goals and intervention procedures. Field experiences required.

648 Introduction to Psychoeducational Assessment (2:2:0) or (3:3:0). Explored are concepts, purposes, terminology, and practices basic to standardized testing of school-aged youngsters. Emphasis is placed on examination of procedures and interpretation of group and individual screening and diagnostic instruments. Practice in scoring and interpreting tests is required.

649 Clinical Psychoeducational Assessment in Special Education (3:3:0). Administration, scoring and interpretation of education evaluation instruments with emphasis on the generated educational plan and written report. Supervised experiences required in the Educational Study Center on selected Saturdays.

655 Curriculum and Methods—Emotional Disturbances/Learning Disabilities (3:3:0). Application of research on teaching effectiveness, teacher accountability and instructional approaches for evaluation with specific attention to language arts instruction. Individual styles and cooperative learning models are investigated.

659 Curriculum and Methods—Early Childhood (3:3:0). Prerequisite Permission of adviser. Emphasis on planning, organizing, implementing and evaluating programs for handicapped children ages two to eight.

661 Curriculum and Methods—Severely Profoundly Handicapped (3:3:0). Prerequisite Permission of adviser. Formulation, implementation and evaluation of individualized educational programs for severely/profoundly handicapped individuals.

665 Family Intervention Programs for Handicapped Children (3:3:0). This course focuses on strategies for developing and strengthening bonds between school and family for the benefit of the handicapped child. Home training approaches, programs, and materials are explored. Due process rights, legal roles of parents, and legislation governing substance and child abuse are emphasized.

668 Vocational and Leisure Education for Severely Handicapped (2:2:0). Prerequisite Graduate standing. Focus on methods and techniques for vocational and leisure training of severely handicapped individuals in school and nonschool settings.

669 Transdisciplinary Approach to Rehabilitation (2:2:0). Prerequisites Graduate standing and permission of adviser. Students are introduced to adaptive equipment and special techniques used by medical disciplines to enhance independence in the physically/multiple handicapped population. Incorporation of therapeutic modalities into other settings is explored via the educational/medical team approach.

http://catalog.gmu.edu
670 Introduction to Gifted and Talented Education (3:3:0). Examination of personal values, academic strengths and leadership qualities of gifted and talented. Identification techniques, articulation of personal philosophy, and rationale for gifted and talented education are studied.

671 a. Special Topics in the Education of Exceptional Children: Counseling the Gifted (1:1:0). Introduction to theory, principles, practices and trends of guidance related to gifted and talented education.

671 b. Special Topics in the Education of Exceptional Children: Identification and Evaluation in Gifted Education (1:1:0). Interpretation of formal and informal measuring devices used to identify gifted and talented students and study of screening models adapted to individual program needs.


671 d. Special Topics in the Education of Exceptional Children: Creative Methods of Solving Problems (1:1:0). Systematic creative methods of problem solving processes will be learned cognitively and experientially.

672 Models and Methods of Teaching in Gifted and Talented Education (3:3:0). Study of theory and practice of gifted and talented education in elementary and secondary education. Theoretical principles are applied to classroom settings. Theories studied include models for teaching, methods, individualization, group procedures and aspects of creativity.

673 Curriculum Design and Research in Gifted and Talented Education (3:3:0). Curriculum design, program models, and program evaluation for gifted and talented individuals presented from a broad perspective including historical aspects and current practices.

674 Seminar in Gifted and Talented Education (3:3:0). Prerequisites Admission to and completion of the graduate program except for internship, and permission of adviser based on satisfactory academic standing. Course focuses on synthesis of preceding course work. Each student designs, implements, and presents a project designed to contribute to the improvement of gifted and talented education. Required seminars are scheduled throughout the year.

782 Comprehensive Topics in Special Education: Trends and Issues (2:2:0). Prerequisites Permission of adviser and permission of Special Education Committee. Designed to synthesize course work, theory, and practical application. Focus on current trends and issues in special education. Students must pass this course to graduate. May be repeated twice. Offered only in fall and spring.

790 Internship in Special Education (1-5:0:0). Prerequisite Permission of the Special Education Committee. Supervised internships include the design and implementation of educational programming for youngsters in campus-based program, public school, approved private school, hospital, institution or clinic. Students enroll in two separate internships appropriate to the area of study for a total of six credits. Applications for field internships are due as follows: fall—April 15, spring—September 15, summer—February 15.

Education Courses (EDUC)

500 In-Service Educational Development (1-6:0:0). Prerequisite Employment in professional capacity by sponsoring division or agency. Offered at request of school division or other educational agency. Content varies. May be repeated.

502 History of Education in the U.S. (2:2:0). Prerequisite Admission to graduate school or permission of instructor. A history of ideas about learning in the U.S. analyzed from the perspective of what can be accomplished for determining the future.

503 Philosophy of Education (2:2:0). Prerequisite Admission to graduate school or permission of instructor. A critical analysis and examination of ancient and contemporary educational philosophies and their impact upon educational thought and practice. The method of instruction is primarily lecture.

504 Issues in Comparative Education (2:2:0). An overview of national systems of education from the perspective of their similarities to and differences from education in the U.S., with special focus on the countries of recent immigrants to the Northern Virginia-D.C. metropolitan area.

506 Education and Culture (3:3:0). Prerequisite Admission to Graduate School or permission of instructor. Examination and application of studies in educational anthropology, with focus on the process of cultural transmission in the U.S. through formal and informal institutions. Analysis of U.S. values, cultural discontinuity, hidden transmission of values in schools, U.S. schools' response to cultural pluralism and cultural transmission in educational systems within other countries.

508 Human Relations for Educators (3:3:0). Helps students develop an awareness of self and self-concept, learn communication skills for improving interpersonal relations, and create a nondiscriminatory school environment.

509 Human Development: Infancy to Middle Childhood (2:2:0). Prerequisite Admission to Graduate School or permission of instructor. Advanced course in the physical, psychological, cognitive, and personality development of the child from birth to age 12. Emphasis is on the critical review of contemporary theories of human development and their relevance to educational practice.

510 Human Development: Adolescence Through Adulthood (2:2:0). Prerequisite Admission to Graduate School or permission of instructor. Advanced course in the physical, psychosocial and cognitive development of the adolescent from pubescence to adulthood, as well as the study of adulthood from a developmental perspective. Emphasis is on the examination of the
principal contemporary theories and conceptualizations of adolescence and adulthood and their application in contemporary educational settings. The relationship between development and learning will also be emphasized.

516 (formerly 684) History and Philosophy of Vocational Education (3:3:0). Prerequisite Completion of undergraduate degree or appropriate educational requirement. Study of historical, philosophical and societal backgrounds of vocational education. Several specialty areas of vocational education and their relationship to general education. Students study current trends in their own areas of specialty with attention to the backgrounds of those trends.

517 Computer Applications for Special Populations (4:3:1). Prerequisite Graduate standing or permission of instructor. A lecture/laboratory course for teachers of special populations (e.g., handicapped, bilingual) in applications of computer technology for instructional programs and career skills. Experiences enable students to utilize computer technology designed specifically for special populations.

521 Foundations of Education (2:2:0). Prerequisite Graduate standing in the Department of Curriculum and Education or permission of instructor. An overview of the various ways of educating and of the socialization processes operating within American educational institutions and other organizations. Current educational practices analyzed in terms of history, philosophy, psychology, sociocultural factors of formal and informal learning. Emphasis on trends, issues, alternative futures.

522 Introduction to Secondary Education (3:3:0). Prerequisite Admission to Graduate School or permission of instructor. Analysis of the philosophical assumptions, curriculum issues, learning theories and history associated with current teaching styles. Emphasis on applications to all disciplines taught in secondary schools. Current educational trends and issues examined in relation to the sociology of secondary school settings.

523 The Exceptional Child in American Education (2:2:0). Prerequisite Graduate standing in the department or permission of instructor. This course will introduce the regular classroom teacher to the psychological, sociocultural, educational and physical aspects of the exceptional child. Emphasis will be given to the integration of the exceptional child in the regular classroom. Lectures, simulations, films and other modes of instruction will be utilized.

524 Learning Theory (2:2:0). Prerequisite Admission to Graduate School or permission of instructor. Examination of the relationships among learning theory, motivation, personality development, social and emotional behavior and student attitudes. Emphasis on putting theory into practice.

529 Pluralism in U.S. Education (2:2:0). Prerequisite Admission to Graduate School or permission of instructor. Examination of cultural pluralism in American education, with a focus on the nature of linguistic and cultural diversity in public schools, including special education settings, the relationship between nonverbal communication and language systems, and interpersonal skills needed for encouraging harmony between the dominant culture and culturally and linguistically diverse communities in the United States.

530 Contemporary Social Issues in Education (2:2:0). Prerequisite Admission to Graduate School or permission of instructor. Examination of selected social issues in education. Uses concepts and information from social sciences to understand the social issues and suggest possible remedies through practice and policy.

532 Bilingualism and Language Acquisition Research (3:3:0). Examination of research in first and second language acquisition, including the interaction of a bilingual person's two languages, with implications for the classroom.

556 Production of Instructional Materials (3:3:0). Prerequisite Course in instructional media. Prepares teachers with basic knowledge needed to produce inexpensive teaching materials. Emphasizes planning, production techniques, and evaluation standards. Students are given an opportunity to work on individual projects in their own subject field.

581 Cooperative Work Study Programs (Curriculum and Methods) (3:3:0). Prerequisite Completion of proper undergraduate requirements in Vocational Education for industrial cooperative instructors. Prepares teachers to develop curriculum material for cooperative work study courses. Opportunity to gain proficiency in the techniques of planning and teaching generally related and directly related curriculum materials.

586 Competency-Based Instruction in Vocational Education (3:3:0). Introduction to practical and theoretical components of the competency-based programs in vocational education. Includes methods and strategies of implementation for specific areas of vocational education: industrial arts, trade and industrial education, home economics, business and office education, health occupations, and cooperative programs.

587 Administration and Coordination of Cooperative Work Programs (ICT) - (COE) (3:3:0). Prerequisite Completion of undergraduate requirements in Vocational Education for industrial cooperative instructors. This course prepares teachers in developing and selecting cooperative work stations. Teachers gain proficiency in planning and working with advisory groups. Included in the course are materials related to employment opportunities, rules and regulations of employment, and design and completion of necessary documentation. State certification for Cooperative ICT Instructors requires completion of this course. The course is the second in the required sequence for certification.

589 Materials and Processes Technology (Variable) (3-12). Advanced lab course focusing on the implementation of new technological methods of manufacturing and testing materials.
energy utilization and products. Students will build, research and test individual products and ideas including the strategies required for classroom implementation.

593 (formerly 625) Utilization of Instructional Technology (3:3:0). Effective utilization of educational technology in the teaching- learning situation.

596 Project in Applied Education (2:2:0). The completion of a research and development project or paper as one of two culminating courses for the master's degree in education. The completed project or paper will contribute to the field of education within the student's specialization.

598 Directed Reading, Research, and Individual Projects (1-6:0:0). Prerequisite Admission to a degree program and permission of department. Various subjects and projects, principally by directed study, discussion, research, and participation under the supervision of a member of the graduate faculty. May be repeated. No more than six hours of EDUC 500. (may also be listed as EDAS, EDGC, EDRD or EDSE) 598 and/or 600 may be applied to degree credit.

599 Thesis (6:0:0). Prerequisite EDUC 590 and 591. Study of a problem of significant interest to the student, utilizing accepted research methods under the supervision of a member of the graduate faculty.

600 Workshop in Education (1-6:0:0). Full-time workshops and weekend seminars dealing with selected topics in education, education tour seminars. May be repeated.

680 Competency-Based Instruction in Vocational Education—Technical Area Specialty (3:3:0). Advanced course. Provides opportunity to research and implement competencies associated with a specific instructional area. Each student researches and identifies present occupationally related skills in the cognitive, psychomotor, and affective domains and incorporates these into a specific instructional program.

681 Organization and Administration of Vocational Education (3:3:0). Study of principles and practices of organizing and administering vocational educational programs in the public schools. Areas of concern are planning, policies, personnel professional development, program development, budgeting, public relations, teacher evaluation, program evaluation, and research.

682 Curriculum Development in Vocational Education (3:3:0). Curriculum development for teachers of vocational subjects. Program development, implementation, and evaluation are studied with emphasis on current trends in vocational education. The impact of the Virginia Vocational State Plan and competency-based instruction are stressed.

686 Teaching and Working with Adult Learners (3:3:0). Prerequisite Completion of undergraduate degree or appropriate educational requirements. Designed to provide adult instructors with the fundamental program skills required to organize and administer programs for teaching adults. Topics relate to vocational and avocational adult basic program goals including an overview of existing vocational and adult programs in the community.

687 Industrial Safety (3:3:0). Prerequisite Completion of undergraduate degree or appropriate educational requirements. Designed to acquaint teachers, industrial managers, and others with the processes and procedures of establishing safety programs for industry and the public schools. Specific areas of concentration highlight OSHA requirements, safety evaluation systems, and safety awareness techniques. Includes review of the legal responsibilities related to various industrial and educational environments. Includes field visits.

688 Internship in Vocational Education (1-6:0:0). Prerequisite Completion of undergraduate degree or appropriate educational requirements. Opportunity to complete a total of six hours placed in education, industry or business associated with the area of teaching responsibility. Students research the various technical and professional skills required for successful employment and develop recommendations for curriculum revisions. Projected program changes are presented to peer groups at regularly scheduled seminars.

695/ENGL 695 Northern Virginia Writing Project In-Service Program (1–3:0:0). Prerequisite Admission to the graduate program or permission of department. Offered at the request of a school division or other educational agency. Content varies. May be repeated with the permission of department. but no more than six semester hours of credit in EDUC 695, ENGL 695 and/or ENGL 699 may be applied toward a master's degree.

696/ENGL 696 Northern Virginia Writing Project/Research Seminar (3:0:0). Prerequisite EDUC 695/ENGL 695 or NVWP Summer Institute. Designed to acquaint classroom teachers with current findings related to the composing process and methods of studying writing in a school setting. Focus on development of a proposal investigating some aspect of the composing process. Teachers who have developed a proposal prior to enrolling will conduct the research during the course.

697/ENGL 697 Northern Virginia Writing Project/Theory of Composition (3). Prerequisite ENGL/EDUC 695 or NVWP Summer Institute. Designed to acquaint classroom teachers with current theory relating to writing and the teaching of composition. Focus is on making explicit participants' theories, on reading the works of leading theorists, and on developing a statement describing the implications of theoretical consistency in the teaching of writing.

699 Computer Applications in Education (3:1:2). This course introduces graduate students to the instructional and database management uses of microcomputers and mainframe computers in school settings. Emphasis is on study, analysis, and exploratory application in laboratory classes of selected concepts of computer usage to achieve objectives common to a variety of formal education settings.
752 Seminar in Instructional Application of Computers (3:3:0). Prerequisite EDUC 699 or permission of instructor. Mastery of BASIC. Concentrates on principles and techniques of implementation of instructional curricula using computers, especially microcomputers. Emphasizes computer-assisted, computer-managed, and computer-based instruction, advanced BASIC statements, the use of instructional programming and authoring languages (e.g., LOGO, PILOT), courseware authoring systems, and the evaluation and validation of educational software for instructional purposes.

754 Seminar in Computers for Educational Administration and Research (3:2:1). Prerequisite EDUC 699 or its equivalent or permission of instructor. Mastery of BASIC. Emphasizes the principles and techniques of using microcomputers, minicomputers and large mainframe computers for purposes of record keeping, management information, instructional supervision and data analytic research in instructional settings in education and industry.

805 Doctoral Seminar in Education (2:2:0). Prerequisite Admission to the D.A.Ed. program. In-depth study of selected topics in education. Students participate in an information exchange with other students, faculty members and other scholars about current research interests and ideas. Students also present their own research in a professional forum. A maximum of 8 credits in EDUC 805 may be credited toward minimum D.A.Ed. requirements.

840 Seminar in Adult Development and Learning (3:3:0). Prerequisite Admission to the D.A.Ed. program or permission of instructor. An advanced course in the nature of the adult learner and the processes of adult learning and development. Emphasizes adults as learners, motivations of adult learners and their participation patterns in adult education activities, and learning theory implications for adult learners.

881 Seminar in Bilingual Education: Policy and Research (3:3:0). Prerequisite Admission to the D.A.Ed. program. Examines the historical development of bilingual education in the U.S., focusing on federal and state legislation and court decisions of the last two decades. Policy issues and programmatic models developed in response to legal mandates and legislative decisions affecting bilingual education are explored in depth from federal, state and local points of view.

882 Seminar in Bilingual Education: Theory and Research (3). Prerequisite Admission to the D.A.Ed. program. Examines the theoretical foundations of bilingual education through focus on linguistic, anthropological, sociological, psychological, and educational research in the areas of first and second language acquisition, language use in a bilingual classroom, code-switching, bilingualism and intelligence, cognitive style, the teaching of reading, language dominance, proficiency assessment, achievement testing, special needs assessment, and research on the effectiveness of bilingual education.

890 Doctoral Internship in Education (3:3:0) or (1:1:0 to 6:6:0). Prerequisite Admission to the D.A.Ed. program. Requires 100 hours of on-site internship completed over at least a five-week period. Interns work with an appropriate staff member in a cooperating school, school system, or other educational institution, agency, or setting. Up to six hours of EDUC 890 may be applied toward D.A.Ed. degree requirements.

895 Seminar in Emerging Issues of Education (3:3:0). Prerequisite Satisfactory completion of EDUC 800 and DAED 800. Focuses on the study of selected emerging issues or problems in education. Students engage in research, study, discussion and writing about various aspects of the topics selected for study. May be repeated. Up to six hours of EDUC 895 may be applied D.A.Ed. requirement.

896 Doctoral Seminar in Curriculum Areas (2:2:0). Prerequisite Successful completion of DAED 800. Focuses on research, theory and exemplary practice in specific subject areas of education. Students engage in research, study, discussion and writing in the designated subject area to analyze trends, assumptions, and important implications for the educational area today and in the future. Usually taken near the end of D.A.Ed. course work.

897 Independent Study for the Doctor of Arts in Education (varying credit). Prerequisite Admission to the D.A.Ed. program and doctoral student status; permission of student’s doctoral advising committee. A structured learning experience designed to extend and develop skills and knowledge relative to a field of professional expertise.

911 Doctoral Projects Seminar (2:2:0). Prerequisite Admission to candidacy in the D.A.Ed. program, successful completion of the doctoral qualifying examination and EDRS 810, 811 and 812 or their equivalents. Development of proposals for individual projects in the D.A.Ed. program. May be repeated. No more than eight hours of EDUC 911 and EDUC 998 may be applied toward the minimum D.A.Ed. degree requirements.

994 Advanced Internship in Education (3:3:0). Prerequisites Admission to the D.A.Ed. program and permission of student’s doctoral committee. Requires internship in a setting related but not identical to the student’s major area of study. Requires a minimum of 100 hours completed over at least a five-week period. Each intern works with an appropriate staff member in a cooperating school, school system, other educational institution or agency, or in a setting that may differ from regular employment.

998 Doctoral Project Research (3:0:3). Prerequisites Admission to candidacy in the D.A.Ed. program, successful completion of the doctoral qualifying examination and EDUC 911. Continued faculty assistance on an individual basis in the completion of projects planned in EDUC 911 and the initiation of new projects. May be repeated. No more than 11 hours of EDUC 911 and EDUC 998 may be applied toward the minimum D.A.Ed. degree requirements.
999 Doctoral Research (1:0:1). Prerequisite
Enrollment in EDUC 998 for required credit,
permission of D.A.Ed Coordinator. Students
engaged in doctoral project research and writing
must register in this course each semester
following approval of their project unless registering
for EDUC 998. Does not count toward the D.A.Ed.
degree credit required. Open only to candidates for
the D.A.Ed. degree in Education. For additional
D.A.Ed. courses see DAED. May be repeated.

Education: Doctor of Arts in Education

The College of Education and Human Services in
cooperation with the College of Arts and Sciences
offers a Doctor of Arts in Education degree as its
major degree in education. The D.A.Ed. degree
provides an advanced liberal arts-professional
education program for experienced educational
practitioners pursuing or planning careers in
nontraditional as well as traditional educational
settings.

Program Requirements
The D.A.Ed. requires a minimum of 85 semester
hours of study beyond the baccalaureate degree or
a minimum of 55 semester hours beyond the
master's degree. A limited number of graduate
hours may be applied to the program. However, an
individual's total program may require more
semester hours than these minimum requirements
depending on the individual's goals and program
requirements.

Program of Study
With the guidance of graduate faculty, students
develop individual programs of study in concert with
their goals, self-assessed skills and knowledge, and
program requirements. Each student's program
must include interdisciplinary study in the liberal
arts, sciences, humanities; in a subject area
supportive of his or her professional specialization;
and in a professional education field.

Structure of Program
All enrollees in the program participate in a
common core of required courses and seminars.
These include:
DAED 800, 801, 802;
EDAS 801;
EDRS 810, 811, 812; and
EDUC 911, 994, 998, and 999.
A sequence of at least three courses (nine
semester hours) must also be taken in a specific
area of special scholarship which may be supportive
of the student's professional area of expertise
(e.g., public affairs for an administrator, English
for an English teacher). Students may choose to
study in one of the following: anthropology, art,
biology, chemistry, communication, economics,
English literature, a foreign language, geography,
geology, government, history, international
relations, linguistics, mathematics, philosophy,
physics, psychology, public administration, and
sociology. Preparation of a research paper
demonstrating proficiency in the chosen subject
culminates this study.

http://catalog.gmu.edu
Areas of Study

Additional internships, research seminars, specialized courses, or reading courses in special areas of education such as educational administration, educational uses of micro-computers, special education, curriculum and instruction, counseling and development, bilingual education, and so on are elected or required to complete the program. The specific nature of all courses is determined by the student in conjunction with his or her faculty doctoral advising committee.

General Program Goals
To complete the D.A.Ed. program each individual must demonstrate competence in oral and written English; computer literacy; mastery of the knowledge and skills of an area of special scholarship and of an area of professional expertise; and the ability to apply general and specific knowledge and skills to significant educational problems. Students demonstrate these competencies by successful completion of courses and seminars, by passing a special written comprehensive qualifying examination near the conclusion of program course work, and by preparation and oral defense of a doctoral project.

Students have five years from the time they enroll in their first class to complete all course work through the comprehensive examination. Two additional years, starting with the date on which students complete the comprehensive examination, are allowed to complete the doctoral project.

Residency
The purposes of residency are achieved in the D.A.Ed. program through a combination of core courses and special seminars and through continuous enrollment. These requirements include successful completion of the Leadership Seminar and of the Ways of Knowing seminar. Students must enroll in at least one approved course each semester they are in the program.

Internship
Candidates enroll in at least one and up to three internships designed to broaden their professional expertise. These internships may occur in a variety of settings. One three-credit internship must be taken in a setting that differs from the student's work setting. In all cases, the student works with University and on-site supervisors.

Admission Requirements
Candidates are admitted to study by the College of Education and Human Services and by a department offering study in a field of special scholarship chosen by the student. Admission is highly selective. Up to 20 persons are admitted to the program each year.

In addition to completing all the University Graduate School admission requirements, each applicant must fulfill the following program admission requirements:

1. A minimum of three years of successful experience as a practitioner in an educational setting;

2. A baccalaureate and/or master's degree from an accredited institution;

3. Demonstration of high intellectual capability;

4. For applicants from public elementary and secondary education, evidence of certification at the Virginia collegiate professional level (or its equivalent from another jurisdiction);

5. Minimum requirements established by the various areas of special scholarship;

6. Demonstrated leadership potential;

7. Three letters of recommendation;

8. Graduate Record Examination or Miller Analogies Test scores;

9. A written goals statement relating the study in the D.A.Ed. program to the applicant's educational and career plans.

The D.A.Ed. program accepts only one class of students annually. Upon faculty approval of a student's program of studies, applicants are admitted to full doctoral student status.

Information and Applications
For further information about admission and program requirements, contact the Graduate School, the Office of Admissions, or the Coordinator of the Doctor of Arts Education program. Completed applications must be submitted to the Admissions office of the University by February 1 of the year in which admission is sought.

Doctor of Arts in Education
Interdisciplinary Courses (DAED)

800 Ways of Knowing (3:3:0). Prerequisite Admission to D.A.Ed. program. Provides an understanding of the methods of inquiry in various fields of study. Examines selected disciplines in terms of subject matter, scope, key concepts, principles, generalizations, and theories in each field. The characteristic way of knowing in each discipline is studied as a tool for the analysis and solution of educational issues and problems.

Required during first semester of study in the program.

801 Seminar in Liberal Education (3:3:0). Prerequisites Satisfactory completion of DAED 800 and 802, and all but one special scholarship course. Analysis of American education from a variety of discipline perspectives. Students apply concepts and methodologies studied to a study of education in America. Includes regular seminar papers and critiques.

897 Independent Study for the Doctor of Arts in Education (varying credit). Prerequisite Admission to the D.A.Ed. program. Independent study in which the student engages in an interdisciplinary study which is supportive of the student's program goals but which is not directly in the field of education or in the student's special discipline. May be repeated up to a maximum of six hours.

For other D.A.Ed. courses see EDUC 805, 840, 881, 882, 890, 895, 896, 897, 911, 994, 998, 999; and EDRS 810, 811, 812, 820.
Education: Educational Leadership and Human Development

Faculty

Benshoff, James M., M.Ed., George Mason University, 1983; Assistant Professor
Cates, Ward M., Ed.D., Duke University, 1979; Associate Professor
Dobson, E. Clark, Ph.D., Florida State University, 1972; Associate Professor
Dunklee, Dennis R., Ph.D., Kansas State University, 1985; Associate Professor
Edgemon, Albert W., Ed.D., Teachers College, Columbia University, 1964; Professor
Lepard, David, Ed.D., University of Massachusetts, 1971; Research Associate Professor
Levy, Jack, Ph.D., University of Southern California, 1973; Associate Professor
Schuchman, Betty J., Ed.D., Indiana University, 1967; Associate Professor
Seligman, Linda H., Ph.D., Teachers College, Columbia University, 1974; Professor
Sockett, Hugh T., Ph.D., King's College, London, 1974; Professor
Thomas, Charles L., Ph.D., Johns Hopkins University, 1971; Associate Professor
Thomas, Wayne P., Ph.D., Virginia Polytechnic Institute and State University, 1980; Associate Professor
Tucker, Susan, Ph.D., St. Louis University, 1976; Associate Professor

Master of Education Programs, M.Ed.

The Department of Educational Leadership and Human Development offers the Master of Education degree in education administration and supervision and in counseling and development.

Students holding the baccalaureate degree or a graduate degree who wish to take courses toward certification, endorsement, or licensure should apply for nondegree status in the Graduate School. For additional information contact the department.

Program Approval and Accreditation

The graduate programs listed above have been approved by the State Department of Education and are accredited by the Southern Association of Colleges and Schools and by the National Council for the Accreditation of Teacher Education.

Program Requirements

It is each student's responsibility to be aware of all requirements and to develop with the assigned adviser a program that will meet the requirements. The program should be developed as soon as possible after the student is admitted to degree status. The typical programs that appear for each degree are offered as examples.

The following programs require a practicum or internship: counseling, education administration and supervision, and certification in school psychology. Students should apply for practicum or internship one semester prior to enrollment and should observe the following application deadlines:

- March 15 for fall semester
- September 15 for spring semester
- February 15 for summer session

Application forms are available in the Office of Professional Education Services. An appropriate form must be completed and returned by the deadline (above) for consideration of the student's adviser.

Education Administration and Supervision

The Master of Education program in Education Administration and Supervision is designed to enable qualified individuals to participate in the leadership and management of schools and other institutions. Through individualization of programs, candidates prepare themselves for a wide variety of positions such as assistant principal, principal, instructional director, instructional coordinator, head teacher, director of education in business or government.

Admission Requirements

All degree applicants must satisfy requirements of the Graduate School and the following:

1. Have an undergraduate grade point average of at least 3.00;
2. Provide three letters of recommendation.

Applicants to the M.Ed. program in education administration and supervision who are planning on a school-based career must:

1. Provide evidence of certification at the collegiate professional level by the State of Virginia or another jurisdiction;
2. Have completed two years of successful teaching experience, a portion of which must be at the level where qualification is desired;
3. Be recommended by three professional educators in the position of principal, supervisor, or administrator, including at least one who has observed the applicant's teaching.

Degree Requirements

The Master of Education Degree in Administration and Supervision requires 30-36 semester hours as follows:
Departmental Foundations Courses (7 semester hours)
EDRS 590 Education Research (3)
EDUC 521 Foundations of Education (2)
Other Foundations course (2)
Program Requirements (15-18 semester hours)
Each student must take the following:
Elementary, Middle, or Secondary School Curriculum (3)
Education Administration (3)
Supervision and Evaluation of Instruction (3)
EDAS 789 Seminar in Education Leadership (3)
EDAS 790 Practicum in Education Leadership (3-6)
Electives (5-8 semester hours)
 Electives are selected in conjunction with adviser
and permit candidates to work toward specific
school endorsements or other specializations.
To meet the departmental comprehensive
examination requirement, candidates for the M.Ed.
degree in education administration and supervision
must present an acceptable written report based
on a practice-oriented project completed during
practicum enrollment.

Nondegree Applicants
Applicants seeking to take selected courses for
administration/supervision certification
(endorsement) or for professional development, not
a degree, should apply as nondegree students.
Generally, nondegree applicants are required to
provide evidence of successful completion of a
master's degree and a master's degree grade
point average of at least 3.00.

Counseling and Development
The Master of Education program in Counseling and
Development is designed to prepare students to
function as counselors and human development
professionals in a variety of work settings including
elementary, middle, and secondary schools,
colleges and universities, and community mental
health agencies, and as other student personnel
professionals in higher education. The program is
designed to develop students' competence in a
broad range of counseling skills, including group and
individual counseling, career counseling, and
assessment. The program emphasizes the
integration of theory and practice and seeks to
prepare knowledgeable and capable helping
professionals for a wide range of employment
settings. The culmination of the students' program
is the internship in which they are placed in an
educational or mental health agency counseling
setting similar to that in which they hope to be
employed. This offers students the opportunity to
test and refine their counseling skills while
experiencing the role of the counselor.

Admission Requirements
Degree Applicants. All degree applicants must
meet the requirements of the Graduate School and
have an undergraduate grade point average of at
least 3.0. In addition, the applicant must satisfy (1)
and (2) below:
1. Students preparing for elementary, middle, or
secondary school counseling positions and seeking
the M.Ed. degree must:
a. Provide evidence of teacher certification by the
state of Virginia or another acceptable jurisdiction;
b. Have successfully completed a minimum of 12
semester hours of undergraduate work in the
behavioral sciences (courses taken to make up
undergraduate deficiencies cannot be used to fulfill
degree requirements);
c. Have completed two years of successful work
experience, one year of which must be in a school
setting:
d. Submit three letters of recommendation from
supervisors or professors regarding the potential of
the applicant for the field of counseling;
e. Submit a statement of interests and objectives;
f. Be interviewed and recommended for
acceptance.
2. Students preparing for counseling and student
development work in colleges and universities and
for counseling in mental health agencies and
seeking the M.Ed. degree must:
a. Possess a baccalaureate degree;
b. Have successfully completed a minimum of 12
semester hours of undergraduate work in the
behavioral sciences (courses taken to make up
undergraduate deficiencies cannot be used to fulfill
degree requirements);
c. Submit three letters of recommendation from
supervisors or professors concerning applicant's
potential as a professional counselor or as a
student professional;
d. Submit a statement of interests and objectives;
e. Be interviewed and recommended for
acceptance.
Nondegree Applicants. Students who wish to take
courses in the counseling and development program
but do not want a degree should apply to the
program as nondegree students:
a. Students seeking endorsement are applicants
with a master's degree in education or in a helping
profession who plan to take a series of courses,
typically including an internship, leading to
endorsement as an elementary, middle, or
secondary school counselor in Virginia.
b. Students seeking licensure are applicants with a
master's degree in a helping profession who plan to
take a series of courses, typically including an internship, to obtain the 60 credits of needed
course work so they can apply for licensure as a
professional counselor in Virginia. (Program
courses have been approved by the Board of
Professional Counselors as meeting all specific
course requirements for licensure in Virginia.)
Students applying under the nondegree applicant
category must submit three letters of
recommendation from supervisors or professors
and a statement of interests and objectives. These
students will generally be required to take a
minimum of 15 credits of course work.

http://catalog.gmu.edu
Degree Requirements

The M.Ed. degree in counseling and development requires 39 semester hours. Students admitted to the degree program will take the following courses:

Department Foundations Courses—7 semester hours
EDUC 521 Foundations of Education (2)
EDRS 590 Education Research (3)
EDUC 509 or EDUC 510 Human Development (2)

Core Courses—23 semester hours
EDGC 604 Analysis of the Individual (3)
EDGC 606 Counseling Theory and Practice (4)
EDGC 608 Group Processes and Analyses (3)
EDGC 610 Career and Educational Counseling (4)
EDGC 754 Practicum in Counseling and Development (3)
EDGC 790 Internship in Counseling and Development (6)

Specialization courses (see below)—9 semester hours

Upon completion of the program the student must pass a comprehensive examination, usually taken during the last semester of study. It is broadly conceived and structured to cover both knowledge and experience.

Areas of Specialization

School Counseling and Development

The school counseling specialization prepares students for careers as elementary, middle, or secondary school counselors. The admission requirements for this specialization were developed to ensure that graduates of the program possess the academic and experiential prerequisites for endorsement as a school counselor by the Virginia Department of Education. Along with the foundations and core courses common to all specializations, school counseling students also take two courses focusing on the school counselor’s role and two other specialization courses. Students who wish to be endorsed at more than one level of school counseling (e.g., elementary and middle) can do so by completing an additional two-credit course and a practicum that is at least 120 hours long.

Required Specialization Courses:
EDGC 620 Philosophy and Principles of School Counseling (1)
EDGC 666 Counseling and Development for Special Populations (3)
EDGC 668 Counseling and Development Programming (3)

One of the following:
EDGC 624 Theories and Practices of Elementary School Counseling (2)
EDGC 626 Theories and Practices of Middle School Counseling (2)
EDGC 628 Theories and Practices of Secondary School Counseling (2)

Higher Education Counseling and Development

The higher education specialization is designed to prepare counselors and other student development professionals who share with teaching faculty the responsibility for humanizing and personalizing each student’s experience in higher education. Graduates of the program are employed in a variety of positions in postsecondary education: counseling centers, career planning and placement, residence halls, student activities, financial aid, academic advising, and special programs for foreign students, returning students, minority students, and others. The higher education counseling specialization focuses on the role of student development professionals, knowledge of special groups, and higher education settings in which student development professionals use their skills.

Required Specialization Courses:
EDGC 644 College Student Development (3)
EDGC 666 Counseling and Development for Special Populations (3)
EDGC 668 Counseling and Development Programming (3)

Community Agency Counseling and Development

The specialization in community agency counseling is designed to prepare counselors for employment in a wide range of settings, including community mental health centers, family counseling centers, agencies specializing in career counseling, businesses and industries, rehabilitation agencies, and counseling programs in federal, state, and local governments. Students complete foundations and core courses along with other students in the program. In addition, specialization courses familiarize students with the role and function of agency counselors and provide special skills they will need such as intake interviews, diagnosis and treatment planning, and couples and family counseling.

Required Specialization Courses:
EDGC 654 Counseling in Community, Agency, and Business Settings (3)
EDGC 656 Diagnosis and Treatment Planning for Mental Health Professionals (3)
EDGC 658 Couples and Family Counseling (3)

School Psychology

Certification in School Psychology can be obtained by completing the M.A. in Psychology. This program, jointly administered by the Departments of Educational Leadership and Human Development and Psychology, is open to students with either an education or psychology background. The degree is offered by the Department of Psychology, while the Department of Educational Leadership and Human Development assumes responsibility for certification. Further information concerning this program can be found under the Psychology section of this catalog.
Administration/Supervision Courses (EDAS)

500 See EDUC 500.

598 See EDUC 598.

599 See EDUC 599.

600 See EDUC 600.

604 Analysis of the Individual (3:3:0). Development of a framework for understanding the individual in counseling, including methods of gathering and interpreting data: choosing, administering, and interpreting individual and group tests: the study of individual differences: use of case study technique.

606 Counseling Theory and Practice (4:3:2). Prerequisite EDUC 509 or 510 or equivalent. Study of theories, principles, and techniques of counseling and applications to counseling settings. Attention to supervised practice sessions. Includes lab.

608 Group Processes and Analyses (3:3:0). Prerequisite EDGC 606. Including theories appropriate to various types of groups, and descriptions of group practices, methods, dynamics, and facilitative skills. Attention to application of theory to practice.

610 Career and Educational Counseling (4:3:2). Prerequisites EDGC 604 and 606. Study of vocational choice theory, sources of occupational and educational information, approaches to career decision-making processes, and career development exploration techniques. Attention to application of theory to practice. Includes lab.

620 Philosophy and Principles of School Counseling (1:1:0). An introduction to school counseling programs at the elementary, middle, and secondary levels. Philosophy and basic principles necessary for effective school counseling programs.

624 Theories and Practices of Elementary School Counseling (2:2:0). School counseling programs at the elementary school level. Emphasis on appropriate counseling practices in the elementary school setting. Developmental needs of students 5 to 10 years of age.

626 Theories and Practices of Middle School Counseling (2:2:0). School counseling programs at the middle school level. Emphasis on appropriate counseling practices in the middle school setting. Developmental needs of students 10 to 14 years of age.

628 (formerly EDGC 634) Theories and Practices of Secondary School Counseling (2:2:0). School counseling programs at the secondary school level. Emphasis on appropriate counseling practices in the secondary school setting. Developmental needs of students 14 to 18 years of age.

644 College Student Development (3:3:0). Introduces theory, nature and background of the student personnel profession in higher education. Structure, organization and administration of services and programs.

654 Counseling in the Community, Agency, and Business Settings (3:3:0). Emphasis on the types of services and facilities provided, needs and problems of the client population served, role and function of the counselor in the agency setting, and personnel needs of the individual agency.

Counseling and Development Courses (EDGC)

500 See EDUC 500.

598 See EDUC 598.

599 See EDUC 599.

600 See EDUC 600.
656 Diagnosis and Treatment Planning for Mental Health Professionals (3:3:0).
Prerequisite EDGC 606. By using actual and hypothetical cases, the course helps the student develop written plans and simulate implementation for overall diagnosis and treatment of clients and their families.

658 Couples and Family Counseling (3:3:0).
Prerequisite EDGC 606. Introduces major approaches to counseling couples and families. Case studies and simulations facilitate the transition from theory into practice.

666 Counseling and Development for Special Populations (3:3:0).
Prerequisite EDGC 606 or permission of instructor. Study of the nature, characteristics, and needs of special groups seeking counseling and development services. Analysis of content, techniques, and goals of programs developed to serve these groups.

668 Counseling and Development Programming (3:3:0). Prerequisite EDGC 606 or permission of instructor. Needs assessment, planning, implementation of counseling and human development programs including the development of workshops, group and individual sessions. Attention is given to consultation and collaboration with other professionals in efforts to facilitate human development and self-direction.

754 Practicum in Counseling and Development (3 or 6:6:0). Prerequisite Minimum of 14 hours of graduate course work in counseling including EDGC 604 and 606. Focus on basic counseling skills through simulated and actual counseling experiences. Students are required to volunteer in a counseling setting and spend time in class meeting for presentation, analysis, and practice of techniques.

790 Internship in Counseling and Development (6:0:0). A. Elementary; B. Middle; C. Secondary; D. Higher Education; E. Agency. Prerequisite Admission to and completion of the graduate program except for internship, and permission of adviser based on satisfactory academic standing and satisfactory level of counseling skill. Supervised practice of counseling in a setting similar to that in which students plan to work. (Elementary, middle, and secondary school internships open to certified personnel only. All other students are placed in a setting related to their career goals.)

Human Resource Development Courses (EDHR)

580 (Formerly EDCI 580) Introduction to Training and Development (3:3:0). Introduction to the field of training and development in industry, government, and other settings. Discussion topics include overview/history of training, basic types of training programs, profiles of training professionals, general training techniques, needs assessment, evaluation, employment opportunities, and others.

600. See EDUC 600.

655 Designing Training Programs (3:3:0).
Topics in the design of training programs in business, government, and educational settings. Included are analysis and practice in needs assessment, goal setting, content/activity selection and evaluation. Students also become familiar with a variety of existing training programs and participate in presentations by practitioners.

Education Research Courses (EDRS) (Formerly EDUC)

531 Educational and Psychological Measurement (3:3:0). Emphasis on techniques and principles used in the construction, administration, and quantification of measuring devices for evaluation purposes; interpretation of standardized tests of ability, aptitude, achievement, interest, and personality.

590 Education Research (3:3:0). Development of skills, sights and understandings basic to performing research, with emphasis on interpretation and application of research results. Critique of research and use of findings in educational settings.

591 Education Statistics (3:3:0). Introduction to practical and applied aspects of statistics in education. Includes selected descriptive and inferential statistics; also statistical data processing.

810 Problems and Methods in Educational Research (2:2:0). Prerequisite Admission to the D.A.Ed. program or permission of instructor. Advanced course in the interpretation and application of education research methods. Emphasizes comparing alternative philosophies of research, ways of formulating questions/hypotheses, research plans and analysis procedures. Students evaluate existing studies and investigate a range of research approaches.

811 Quantitative Methods in Educational Research (3:3:0). Prerequisite Satisfactory completion of EDUC 810 or its equivalent or permission of instructor. Emphasizes advanced methods of conducting research using quantitative methods of data collection and analysis appropriate for research in education. Includes the design of experimental and quasi-experimental research studies and methods of analysis appropriate to these studies, including the analysis of variance and multiple linear regression.

820 Evaluation Methods for Educational Programs and Curricula (3:3:0). Prerequisite Satisfactory completion of EDUC 810 or its equivalent or permission of instructor. Explores the
Areas of Study

development and types of current systems and models for evaluating educational programs and curricula. Emphasis is on procedures for evaluation of public and private elementary and secondary schools, colleges and universities, and government and industrial education programs.

School Psychology Course (EDSP)

790 School Psychology Internship (3, 6, 9, 12:0:0) (formerly PSYC 765 and EDUC 665). Prerequisites Completion of required courses in school psychology and permission of program coordinator. One-school-year supervised field experience where the advanced school psychology student functions as a full-time staff member within a school system. Student completes a paper on a practical research project which involves an alternative school psychology role in the school system. Enrollment is for a total of 9 hours (thesis option) or 12 hours (nonthesis option) in increments of 3 hours according to placement. Students enrolled in PSYC 799 are not required to complete the practical research project.

Additional Courses. See listings in the Department of Curriculum and Instruction under the prefixes EDCI, EDRD, EDSE, and EDUC; and in Doctor of Arts in Education for courses with DAED prefix.

English

Faculty

Albanese, Denise, Ph.D., Stanford University, 1986: Assistant Professor
Bausch, Richard C., M.F.A., University of Iowa, 1975: Associate Professor
Baxter, Ralph, Ph.D., Wayne State University, 1964: Professor
Bergmann, Johannes D., Ph.D., University of Connecticut, 1969: Associate Professor
Brown, Lorraine A., Ph.D., University of Maryland, 1968: Professor
Brown, Stephen J., Ph.D., Yale University, 1959: Professor
Brunette, Peter C., Ph.D., University of Wisconsin, 1975: Associate Professor
Cheuse, Alan, Ph.D., Rutgers University, 1974: Associate Professor
Comito, Terry A., Ph.D., Harvard University, 1968: Professor
D’Andrea, Paul, Ph.D., Harvard University, 1966: Robinson Professor
Derrick, Scott, Ph.D., University of Pennsylvania, 1987: Assistant Professor
Foreman, Joel E., Ph.D., The George Washington University, 1975: Associate Professor
Foster, John B., Ph.D., Yale University, 1974: Associate Professor
Gallehr, Donald R., Ph.D., The Catholic University of America, 1974: Associate Professor
Garson, Helen S., Ph.D., University of Maryland, 1967: Professor
Goodwin, Stephen H., M.A., University of Virginia, 1969: Associate Professor
Gras, Vernon W., Ph.D., University of Chicago, 1967: Professor
Grewal, Inderpal, Ph.D., University of California, Berkeley, 1987: Assistant Professor
Grossberg, Frederick A., Ph.D., Harvard University, 1975: Associate Professor
Hammond, Jeffrey A., Ph.D., Kent State University, 1979: Associate Professor
Hodges, Devon L., Ph.D., State University of New York at Buffalo, 1979: Associate Professor
Holinsky, Dee A., Ph.D., University of Chicago, 1980: Assistant Professor
Irvine, Lorna M., Ph.D., The American University, 1977: Associate Professor
English, M.A.

Admission Requirements
In addition to fulfilling Graduate School admission requirements, applicants must submit one copy of a 1,000-word writing sample and two letters of recommendation. The writing sample may be a paper written for an undergraduate class or any other material that gives evidence of writing skills. In addition to the writing sample requirement, applicants for the concentration in professional writing and editing must submit a statement of purpose (no more than 750 words) and two copies of a 10- to 15-page portfolio of their nonfiction work (a technical or business report, an essay, a term paper, an editing project, or any other material reflecting the student's interests and skills in nonfiction writing). Applicants for the concentration in the writing of fiction or poetry must submit, in addition to the 1,000-word writing sample, two copies of a portfolio consisting of up to 10 pages of poetry or 20 pages of fiction. Applicants may submit scores on the GRE when they believe those scores will lead to a clearer presentation of their qualifications. Those with undergraduate majors in disciplines other than English are encouraged to apply, but may be required to make up deficiencies before entering the program.

Degree Requirements
Students must successfully complete 30 semester hours of credit in graduate English courses. With the approval of the department, up to six hours of graduate credit in courses in related disciplines may be substituted for six hours in English.

General Requirements for all Concentrations
1. ENGL 701 (normally in the first semester of study).
2. Nine hours in literature courses, including at least three hours of Master's Seminar (either ENGL 790, Topics in Literary History, or ENGL 791, Themes, Modes and Genres). For the concentration in the teaching of writing and literature only, ENGL 610 may be used to fulfill three hours of the literature requirement.

Students who have not completed 12 hours of undergraduate credit or its equivalent in a foreign language must either do so or demonstrate equivalent proficiency by passing a translation test administered by the English department.

Graduate English Programs
The Department of English offers graduate study designed to provide professional training in the study and practice of writing and literature to students with widely differing aims. The M.A. in English (30 semester hours) provides concentrations in the following areas: (1) literature, (2) professional writing and editing, (3) the writing of fiction and poetry, and (4) the teaching of writing and literature. The department also offers a terminal degree, the M.F.A. in creative writing (48 semester hours). In addition, the department offers an M.A. with a concentration in linguistics, a certificate in the teaching of English as a second language (TESL, 15 semester hours), and courses as part of the Doctor of Arts in Education degree.
Concentration Requirements (one concentration must be completed)

1. Concentration in Literature:
   a. General requirements (above).
   b. Three hours in critical theory at the 600-700 level.
   c. Three hours of Master’s Seminar in addition to those used to satisfy the general requirements. Students in this concentration should complete both ENGL 790 (Topics in Literary History) and ENGL 791 (Themes, Modes, and Genres).
   d. Nine hours in a core program organized by period, genre, theme, or some other principle approved by the student’s adviser and the director of graduate studies in English. These hours will customarily be in addition to those used to satisfy the general requirements. In two courses of the core program, the candidate must write an M.A. paper—a substantial paper on a topic agreed upon with the course instructor at the beginning of the semester. The M.A. papers must receive a grade of B or better, and will be filed with the Department of English.
   e. Three hours of electives.
   f. Optional: six hours of thesis may be substituted for the core program.

2. Concentration in Professional Writing and Editing:
   a. General requirements (above).
   b. Three hours in nonfiction writing.
   c. Nine hours in professional courses: e.g., editing, technical writing, scientific writing, internship in writing or editing, or Northern Virginia Writing Project.
   d. Three hours of electives in writing or literature.
   e. Three hours of thesis.

3. Concentration in the Writing of Fiction or Poetry:
   a. General requirements (above).
   b. Three hours in Form of Fiction or Form of Poetry.
   c. Six hours of workshop in this genre.
   d. Three hours of thesis in this genre.
   e. Six hours of electives in writing or literature.

4. Concentration in the Teaching of Writing and Literature:
   a. General requirements.
   b. Six hours in writing courses.
   c. Three hours in linguistics.
   d. Three hours in the teaching of writing and three hours in the teaching of literature.
   e. Three to six hours of electives from literature or writing; alternatively, a thesis may be arranged through the student’s adviser and the Director of Graduate Studies in English.

English: Linguistics, M.A.

The M.A. degree in English: Linguistics is an interdisciplinary program that 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.

Admission Requirements

The admission requirements are the same as those for the other concentrations in the Master of Arts in English. Students with undergraduate majors in any field are encouraged to apply. There are no specific prerequisites.

Degree Requirements

Students must successfully complete 30 semester hours of graduate credit distributed as follows:

1. Fifteen hours in the following core courses: ENGL 520, 690, 691, 785, 786. Candidates in the TESL program may substitute ENGL 522 for ENGL 786.

2. Fifteen hours of graduate electives, chosen in consultation with an adviser, which reflect one or more areas of language study. The electives can be in such areas as literary criticism, bilingual education, or a foreign language, and may include six hours of thesis.

Students who have not already completed 12 hours of undergraduate credit (or its equivalent) in a foreign language must either do so or demonstrate equivalent proficiency by passing a translation test administered by the English Department. See the section on Certificates, Programs, and Additional Graduate Courses for additional information on the TESL program.

Creative Writing, M.F.A.

Admission Requirements

In addition to fulfilling Graduate School admission requirements, applicants must submit two letters of recommendation, one copy of a 1,000-word nonfiction writing sample, and two copies of a portfolio of fiction and/or poetry. The nonfiction writing sample may be a paper written for an undergraduate class or any other work that gives evidence of basic writing skills. The additional portfolio should contain up to 20 pages of poetry or 50 pages of fiction.

Degree Requirements

Students must successfully complete 48 semester hours of graduate credit, including:

1. Three hours in ENGL 701;

2. Twelve hours in literature, including at least three hours of Master’s Seminar (ENGL 790, Topics in Literary History, or ENGL 791, Themes, Modes, and Genres);

3. Twelve to 18 hours of writing seminars in one genre, including either Form of Poetry or Form of Fiction and at least 3 hours of Advanced Workshop (ENGL 750 or 751);

4. Three to nine hours in other genres;

5. Three to six hours in nonliterary art;

6. One to three hours in internship (optional);
7. Six hours in thesis. Students must give a public reading of their work at the end of the semester in which their thesis is approved.

Up to nine hours of electives may be chosen in consultation with the writing program staff.

Students must pass an M.F.A. exam based on the authors they have chosen. The authors are selected in collaboration with the writing faculty any time after the completion of 12 hours of course work and before the completion of 32 hours. The exam must be completed at least one semester before the thesis is submitted.

Students who have not completed 12 hours of undergraduate credit (or its equivalent) in a foreign language must either do so or demonstrate equivalent proficiency by passing a translation test administered by the English Department.

Basic Discipline in English as Part of Doctor of Arts in Education

Admission Requirements

In addition to material requested by the Graduate School and the College of Education and Human Services, applicants planning a basic discipline in English must present:

1. Scores from the aptitude section of the GRE;
2. A writing sample of approximately 1,000 words;
3. A letter of recommendation from a person with specific knowledge of the applicant’s work in English.

While a B.A. or an M.A. in English is desirable, an applicant must have earned the following minimum requirements:

1. Fifteen hours of graduate or upper-division undergraduate work in English or American literature;
2. Three hours in graduate or upper-division undergraduate work in Linguistics or History of the Language;
3. Three hours of graduate work in Bibliography and Research and three hours of graduate work in Critical Theory.

Applicants with a particular interest in a concentration in writing are also required to present evidence of advanced work in the field. Especially qualified students who lack certain requirements listed above may be admitted and allowed to enroll in the appropriate English courses on the graduate level. These courses will not be counted toward the D.A.Ed.

Degree Requirements

1. A minimum of six hours of ENGL 800, studying material relevant to the student’s individual goals;
2. Three hours of independent research, directed by the student’s D.A.Ed. adviser;
3. A substantial research paper (three hours), to be written under the direction of the D.A.Ed. adviser and at some stage shared and discussed with other students in the D.A.Ed. program.

Nondegree Status

Persons who are not yet certain about their plans for graduate study may apply for nondegree status. Only an undergraduate transcript is required for this application.

English Courses (ENGL)

503 Theory and Practice of Editing (3:3:0). Prerequisite 6 hours of English courses numbered above 300, including one advanced writing course—309, 310, 397, 398, 458, 464, 489, 497 or permission of department. Instruction in revising, editing, and preparing specialized writing for printing. Emphasis on methods of achieving clarity, accuracy, and completeness. Lecture and discussion on editing and printing techniques, practical exercise in revision, layout, and production.

504 Internship in Writing and Editing (3:0:0). Prerequisite Open to senior English majors and graduate students pursuing the M.A. in English or the M.F.A. Contact the English Department one semester prior to enrollment. Internships are approved work-study positions in writing or editing established by the English Department with specific employers. Variable credit. Variable prerequisites.

507 (EDCI 507) Internship in Applied Linguistics (3:0:0). Prerequisite ENGL 521 or EDCI 519. Contact the English Department one semester prior to enrollment. Internships provide experience working in a language-teaching program or an educational research organization.

511 Styles and Modes in Literary History (3:3:0). A historical consideration (not a survey) of some of the principal styles, in prose and poetry, of English and American Literature.

512 (PHIL 530) Issues in Literature and Philosophy (4:3:1). Prerequisites Graduate or senior standing, 6 hours of upper-level English, 6 hours of philosophy, and permission of instructor. An interdisciplinary seminar that offers students an opportunity to arrive at a personal synthesis of work previously done in philosophy and literature. The topic will change yearly but will focus on themes or methodologies common to both disciplines.

513 Advanced Special Topics in English (3:3:0). Prerequisites 15 hours of advanced undergraduate English courses and permission of department, or a baccalaureate degree. An intensive study of selected topics in English and American literature. May be repeated for credit with permission of department.

514 (CLS 500) Theories of Comparative Literature (3:3:0). Prerequisite CLS 300 and senior standing, or baccalaureate degree, or permission of instructor. An intensive study of the major theories of comparative literature with special emphasis on international movements and their characteristic themes. Students work with texts in the foreign language of their competence; other texts are studied in translation.
520 (620) Descriptive Linguistics (3:3:0). Introduction to the terminology and methodology of modern linguistic science and a detailed structural analysis of English phonology, morphology, and syntax. May not be taken by anyone who has previously taken and satisfactorily completed ENGL 620.

521 (621) Applied Linguistics: Teaching English as Foreign Language (3:3:0). Prerequisite An introductory linguistics course (which may be taken concurrently). Theories and basic principles of the acquisition of a second language, especially as they relate to the English language, supplying students with methods of teaching English to speakers of other languages. May not be taken by anyone who has previously taken and satisfactorily completed ENGL 621.

522 Modern English Grammar (3:3:0). Prerequisite A or B in ENGL 391, 485, 520 or equivalent. Overview of the structure of modern English beginning with word classes and ending with transformational analyses of complex sentences. Most topics are introduced as problems of language description; in solving them, principles of syntactic argumentation are demonstrated as well. Students learn to tap their own intuitions about English to analyze grammatical structure.

551 Literary Criticism (3:3:0). Studies of major critical theories and techniques with emphasis on the twentieth century.

556 (555) Literary Style (3:3:0). Theory and practical analysis of English literary style. Several methodologies, including impressionistic, rhetorical, and linguistic, are examined and applied to the language of various literary texts, including essays, poems, and novels.

557 Old English (3:3:0). Study of Old English language, including its phonology, morphology, syntax and lexicon, aimed at preparing students to read Anglo-Saxon literature in its original form. Accompanied by reading from Anglo-Saxon prose and poetry of the seventh through the eleventh centuries. Selections from The Anglo-Saxon Chronicle, Aelfric's Homilies, The Legend of St. Andrew, and other prose works, as well as such verse as The Dream of the Road, The Seafarer, and Judith, are read and translated.

564 Form of Poetry (3:3:0). Prerequisites ENGL 464 or equivalent and permission of instructor. Students must submit a typed manuscript of original poetry at least one week before they intend to register. For specific guidelines, consult the department's course description booklet, the instructor, or the department secretaries. Intensive study of and practice in the formal elements of poetry through the analysis of models and weekly or biweekly writing assignments. Intended for students already writing original poetry. Students study rhyme, meter, rhythm and other musical elements of poetry, lineation, stanza pattern, traditional and experimental forms, free verse and open-form composition, lyric, narrative, and dramatic modes.

566 (555) Form of Fiction (3:3:0). Prerequisites ENGL 465 or equivalent and permission of instructor. Students must submit a typed manuscript of original fiction at least one week before they intend to register. For specific guidelines, consult the department's course description booklet, the instructor, or the department secretaries. Intensive practice in the formal elements of fiction, through the analysis of models and weekly or biweekly writing assignments. Intended for students already writing original fiction. Students study description, narration, plot, dialogue, voice, point of view, style, epiphany, and antithesis techniques.

581/PSYC 581 Psycholinguistics (3:3:0). Prerequisite An introductory linguistics or psychology course, permission of instructor. Study of mental and psychological aspects of human language, including aphasia, association, autism, language acquisition, verbal concept formation, and perception.

582 (590) Applied Linguistics (3:3:0). Prerequisite A or B in ENGL 391, 485 or 520, permission of instructor. Study of the applications of linguistic science to the teaching of the English language. Attention is given to linguistic foundations of teaching English as a second language, findings of linguistics with regard to composition instruction, and ways in which linguistics can support the teaching of literature and literary style.

592 (392) History of the English Language (3:3:0). Introduction to the history and development of the English Language, including study of Indo-European language family and various stages of the English language from Old and Middle English to Early and Recent Modern English and American English; emphasis on historical principles and theory of language change as it affects phonology, morphology, syntax, and semantics.

610 Proseminar in Teaching the Reading of Literature (3:3:0). Methods of teaching literature, includes study of methods of literary analysis and ways of developing student responses to literature, with some classroom practice. (Does not satisfy Virginia certification requirement in diagnostic or developmental reading.)

613 Technical and Scientific Writing (3:3:0). Prerequisite ENGL 616 or permission of department. Intensive study of theory and practice of technical and scientific writing, with emphasis on writing for a variety of audiences. Focus on writing and evaluating formal reports, articles for lay as well as technical audiences, proposals, theses, manuals, and other forms of technical prose.

614 Internship in the Teaching of Writing (1:0:0). Prerequisite Open to graduate students currently enrolled in ENGL 615-A. Subject to approval of the CTC director or the Writing Place director. Qualified students serve as tutors for three hours a week in the University's Composition Tutorial Center under the guidance of the CTC director or in the English Department Writing Place under the guidance of the Writing Place director. A journal on the experience is kept and a paper submitted at the end of the semester synthesizing
what students have learned and describing their progress as teachers. Not repeatable for credit.

615 Proseminar in Composition Instruction (3:3:0). Methods of teaching expository writing. Includes consideration of planning of courses, practice in teaching and in grading papers, and study of lab method of instruction.

616 The Writing of Nonfiction (3:3:0). Prerequisite Permission of instructor. Students must submit a typed manuscript at least one week before they intend to register. For specific guidelines, consult the department’s course description booklet, the instructor, or the department secretaries. Writing of original essays, biographies, documentaries, reports, and other forms of nonfiction.

617 Poetry Writing Workshop (3:3:0). Prerequisites ENGL 564 or equivalent and permission of instructor. Students must submit a typed manuscript at least one week prior to registration. For specific guidelines, consult the department’s course description booklet, the instructor, or the department secretaries. Intensive practice in the craft of poetry and study of the creative process. Intended for students already familiar with traditional and contemporary poetic modes and already writing original poetry. At the discretion of the instructor, reading may be required. May be repeated for credit with permission of department.

618 Fiction Writing Workshop (3:3:0). Prerequisites ENGL 566 (565) or equivalent and permission of instructor. Students must submit a typed manuscript at least one week prior to registration. For specific guidelines, consult the department’s course description booklet, the instructor, or the department secretaries. Intensive practice in the craft of fiction and study of the creative process. Intended for students already familiar with traditional and contemporary fiction and already writing original fiction. At the discretion of the instructor, reading may be required. May be repeated for credit with permission of department.

619 Special Topics in Writing (3:3:0). Prerequisites Two graduate writing courses and/or permission of instructor. Students must submit a typed manuscript at least one week prior to registration. For specific guidelines, consult the department’s course description booklet, the instructor, or the department secretaries. A workshop course; intensive practice in creative writing and study of the creative process. Concentrates on a specialized literary type other than the short story or poetry (i.e., the essay, playwriting, film writing, children’s literature, travel literature, autobiography, the gothic novel, translation); the concentration is announced in the department’s course description booklet. Intended for students already writing original creative work. May be repeated for credit with permission of department.

622 The Structure of Contemporary American English (3:3:0). Introductory survey of the phonology, morphology, and syntax of contemporary American English, with discussion of language attitudes and dialect variation due to region, social class and sex. This course is intended primarily for nonlinguistics majors; it cannot be taken for credit by students who have taken both ENGL 520 (620) and ENGL 522.

625 Studies in English Medieval Literature (3:3:0). Selected literary authors, works or movements, generally excluding Chaucer, from between 1300 and 1500, studied in Middle English. Content varies. May be repeated for credit with permission of department.

630 Studies in English Renaissance Literature (3:3:0). Selected literary authors, works, or movements, generally excluding Shakespeare and Milton, of the English Renaissance. Content varies. Recent offerings include Women in Shakespeare; The Golden Age and Earthly Paradise; and The Pastoral Tradition. May be repeated for credit with permission of the department.

631 (765) Seminar in Shakespeare (3:3:0). Intensive study of the achievement of Shakespeare and major critical approaches to his work. Usually comedies and histories are taught one year, and tragedies and romances the next. May be repeated for credit with permission of the department.

635 Studies in Eighteenth-Century English Literature (3:3:0). Selected English literary authors, works or movements of the eighteenth century. Content varies. Recent offerings include Johnson and his Circle; Sympathy, Selfishness, and Self-Realization; and Sexual Motifs in Eighteenth-Century Poetry, Prose, and Drama. May be repeated for credit with permission of department.

640 Studies in Nineteenth-Century English Literature (3:3:0). Selected English literary authors, works or movements of the nineteenth century. Content varies. Recent offerings include Romantic Visionary Poets; Youth and identity; and Jane Austen, Charlotte Bronte, George Eliot. May be repeated for credit with permission of department.

645 Studies in Twentieth-Century English Literature (3:3:0). Selected English literary authors, works or movements of the twentieth century. Content varies. Recent offerings include developments since WW II: Contemporary British Drama; British Novel to WW II. May be repeated for credit with permission of department.

650 Studies in Seventeenth- and Eighteenth-Century American Literature (3:3:0). Selected literary authors, works, or movements of colonial and early federalist America. Content varies. May be repeated for credit with permission of department.

655 Studies in Nineteenth-Century American Literature (3:3:0). Selected American literary authors, works or movements of the nineteenth century. Content varies. Recent offerings include The American Renaissance and The Novel and American Society. May be repeated for credit with permission of department.
660 Studies in Twentieth-Century American Literature (3:3:0). Selected American literary authors, works, or movements of the twentieth century. Content varies. Recent offerings include The Federal Theatre Project; Gothicism in Southern Literature; Physics and Metaphysics in the Modern Novel; and The Wasteland Theme. May be repeated for credit with permission of department.

666 (770) Seminar in Major Figures of English Literature before 1800 (3:3:0). Intensive study of the work of one or two major figures of English literature before 1800. Content varies. Recent offerings include Chaucer; Milton; Blake; Fielding and Sterne. May be repeated for credit with permission of department.

667 (776) Seminar in Major Figures of English Literature after 1800 (3:3:0). Intensive study of the work of one or two major figures of English literature after 1800. Content varies. Recent offerings include Yeats; V. Woolf; Dickens and Gissing; Joyce; Elizabeth Gaskell and C. Bronte. May be repeated for credit with permission of department.

668 (780) Seminar in Major Figures of American Literature (3:3:0). Intensive study of the work of one or two major figures of American literature. Content varies. Recent offerings include Stevens; Hemingway; Eliot and Pound; Melville; Whitman; Bellow and Singer. May be repeated for credit with permission of department.

670 Film History and Theory (3:3:0). Prerequisite Introductory film course or permission of instructor. Advanced study of the history of film art and major theories concerning the nature of film. Specific topic varies. May be repeated for credit with permission of department.

675 Feminist Criticism and Theory (3:3:0). Seminar designed for students who desire an introduction to criticism and theory which studies the role of gender in literature and in the practice of interpretation.

685 Selected Topics, Movements or Genres of Literature in English (3:3:0). Content varies. May be repeated for credit with permission of department.

690 (531) Generative Phonology (3:3:0). Prerequisites A or B in ENGL 391, 520 or permission of instructor. Sound systems of English and other languages from the perspective of generative phonology. Topics include phonetic basis of phonology, distinctive features and phonological notation, natural processes, and rule ordering.

651 (535) Theories of Language (3:3:0). Prerequisite A or B in ENGL 391, 485, 520 or permission of instructor. Study of the history and development of the science of linguistics. Important theories of language are surveyed including those of Saussure, Bloomfield, Chomsky, and others.

695/EDUC 695 Northern Virginia Writing Project Inservice Program (1,2,3:0:0). Prerequisite Admission to the graduate program or permission of department. Offered at the request of a school division or other education agency. Content varies. May be repeated for credit with permission of department, but no more than six semester hours of credit in ENGL 695, EDUC 695 and/or ENGL 699 may be applied toward a master’s degree in English.

696/EDUC 696 Northern Virginia Writing Project Teacher/Research Seminar (3:0:0). Prerequisite ENGL 695/EDUC 695 or NVWP Summer Institute. Designed to acquaint classroom teachers with current findings related to the composing process and methods of studying writing in a school setting. Focus on development of a proposal investigating some aspect of the composing process. Teachers who have developed a proposal prior to enrolling will conduct the research during the course.

697/EDUC 697 Northern Virginia Writing Project Theory of Composition (3:3:0). Prerequisite ENGL/EDUC 695 or NVWP Summer Institute. Designed to acquaint classroom teachers with current theory relating to writing and the teaching of composition. Focus is on making explicit the theories of the participants, on reading the works of leading theorists, and on developing a statement describing the implications of theoretical consistency in the teaching of writing.

699 Workshop in English (1-3:0:0). Prerequisite Admission to the graduate program or permission of department. Concentrated workshops, educational tours, and special seminars dealing with selected topics in writing, linguistics, film, the electronic media, and literature written in English. All tours are optional and may be replaced by specified work conducted on campus. May be repeated for credit with permission of the department, but no more than six semester hours of credit in ENGL 699 may be applied toward a master’s degree in English.

701 Literary Scholarship (3:3:0). Methods and purposes of literary research, including study of library methodology, use of critical bibliographies, techniques of textual criticism, and evaluation of various approaches to literary history.

705 Literary Theory and Criticism (3:3:0). Major theories of literature and methods of analyzing and evaluating literary works. Content varies. Recent offerings include Recent Trends in Critical Theory. May be repeated for credit with permission of the department.

750 Advanced Workshop in Poetry Writing (3:3:0). Prerequisites ENGL 564 and ENGL 617 and permission of instructor. Students must submit a typed manuscript at least one week prior to registration. For specific guidelines, consult the department’s course description booklet, the instructor, or the department secretaries. Intensive practice in the craft of poetry for experienced writers. May be repeated for credit with permission of the department.

751 Advanced Workshop in Fiction Writing (3:3:0). Prerequisites ENGL 566 and ENGL 618 and permission of instructor. Students must submit a typed manuscript at least one week prior to registration. For specific guidelines, consult the department’s course description booklet, the
Foreign Languages and Literatures

Faculty

Aguera, Victorio G., Ph.D., The Catholic University of America, 1971; Professor
Berroa, Rei, Ph.D., University of Pittsburgh, 1983; Assistant Professor
Buñuel, Jose A., Ph.D., George Washington University, 1985; Assistant Professor
Chamberlain, Jeffrey T., Ph.D., University of Illinois, 1982; Assistant Professor
Cordero, Anne D., Ph.D., The George Washington University, 1968; Associate Professor
Elstun, Esther N., Ph.D., Rice University, 1969; Professor
Francescato, Martha P., Ph.D., University of Illinois, 1970; Professor
Goldin, Mark G., Ph.D., Georgetown University, 1968; Associate Professor
Hazera, Lydia D., Ph.D., The George Washington University, 1971; Associate Professor
LePage, Raymond G., Ph.D., The George Washington University, 1972; Associate Professor
Lewis, Paula G., Ph.D., Columbia University, 1973; Professor
Marquez, Roberto, Ph.D., Harvard University, 1975; Professor
Meyer, Henry P., Ph.D., University of Maryland, 1970; Associate Professor
Ricouart, Janine, Ph.D., University of Maryland, 1970; Associate Professor
Wagner, Irmgard, Ph.D., Harvard University, 1970; Associate Professor
Wekerle, Inge B., Ph.D., The George Washington University, 1975; Assistant Professor
Willis, William S., Doctorat de l’Universite, University of Paris, 1951; Professor

Foreign Languages and Literatures, M.A.

The Master of Arts in Foreign Languages is designed to meet the needs and interests of prospective and practicing teachers and other professionals, and to prepare students for doctoral study in foreign languages at other institutions. The program offers the possibility of concentrating in French, German, or Spanish, or in two of those...
languages. A third concentration is also available in Spanish/Bilingual-Multicultural Education.

**Admission Requirements**

In addition to satisfying the general admission requirements of the Graduate School, applicants seeking degree status must hold a baccalaureate degree with a major in French, German, or Spanish; have at least a 3.0 grade point average (on a 4.0 scale) in the major; and submit two letters of recommendation from persons familiar with their 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 to take the appropriate part(s) of the Graduate Record Examination. They may also have undergraduate deficiencies to make up before being advanced to degree status.

**Degree Requirements**

Candidates who elect a concentration in one language must complete a program of 30 semester hours of study. Those who concentrate in two languages must complete a program of 42 semester hours. The concentration in Spanish/Bilingual-Multicultural Education requires 36 semester hours. In all three concentrations, 6 of the total hours may be earned with a thesis. Regardless of the concentration selected, all students must meet the core and distribution requirements given below, and must pass a written comprehensive examination.

**Concentration in One Language**

Thirty semester hours, of which at least 18 must be earned in courses listed under a single rubric (FREN, GERM, or SPAN), to include the following distribution: at least 6 hours in literature courses covering two different periods and at least 6 hours in language/linguistics courses. The remaining 12 hours are electives, of which up to 6 may be used for directed reading (798) and thesis (799).

**Concentration in Two Languages**

Forty-two semester hours, of which 18 must be earned in each of two languages, in courses listed under a single rubric (FREN, GERM, or SPAN), to include the following distribution: at least 6 hours in literature courses covering two different periods; and at least 6 hours in language/linguistics courses. The remaining 6 hours are electives, which may be used for directed reading (798) and thesis (799).

**Concentration in Spanish/Bilingual-Multicultural Education**

Thirty-six semester hours, of which 18 must be earned in courses listed under the SPAN rubric, to include the following distribution: at least 6 hours in literature courses covering two different periods and at least 6 hours in language/linguistics courses: 6 hours of bilingual education seminars, selected from among EDUC 517, 518, 519. The remaining 12 hours are electives, of which up to 6 may be used for directed reading (SPAN 798) and thesis (SPAN 799).

**Foreign Languages and Literatures Courses (FRLN)**

510 Bibliography and Research Problems in Foreign Languages and Literatures (3:3:0).
Prerequisite Graduate standing or permission of department. Use of basic bibliographical tools and methodologies necessary to do scholarly research in French, German, and Spanish. Taught in cooperation with the University library staff. Conducted in English.

525 Literary Translation (3:3:0). Prerequisite Graduate standing or permission of instructor. Advanced work in literary translation. The critical approach to and analysis of diverse literary texts ranging from poetry, drama, and essay to excerpts from novels.

555 Theory of Translation (3:3:0). Lectures on the nature and function of the translating process. Evaluation of theories of translation with respect to text--typology. Critiques of selected translations from the target languages to English and vice versa.

590 Internship and Seminar in Translation (3:3:0). Prerequisite Admission to the Translation Certificate Program. Internships are nonpaying, work-study positions that focus on the practice of translation. Qualified students are placed with area institutions, interest groups, agencies or corporations. Placement depends upon availability of positions.

600 Workshop in Foreign Languages (1-6:0:0).
Prerequisite Graduate standing or permission of instructor. In-service workshops, tours, and seminars dealing with selected topics in literature, language, bilingualism, culture, methodology, etc. May not normally be applied toward the M.A. in foreign languages.

620 Literary Theory and Criticism (3:3:0). Study of the nature of the literary work; analysis of contemporary critical approaches to literature. May not be taken for credit by students who previously received credit for FRLN 615.

645 (545) The Study and Teaching of Literature (3:3:0). Current methodologies of literary analysis. Emphasis on role of literature in foreign language programs and on providing students with various methods of teaching literature. May not be taken by anyone who has previously taken and satisfactorily completed FRLN 545.

650 The Teaching of Culture in Foreign Language Programs (3:3:0). Purpose and methods of the study of culture, with emphasis on strategies and techniques for teaching culture in foreign language programs.

660 Approaches to the Study of Language (3:3:0). The discipline of linguistics and its relationship to other disciplines, including study of generative grammar with syntactic problems drawn from commonly taught foreign languages.
670 (570) Foreign Language Learning and Teaching (3:3:0). Theories, methods, and strategies of second and foreign language learning and teaching. May not be taken by anyone who has previously taken and satisfactorily completed FRLN 570.

French (FREN)

515 Medieval French Literature (3:3:0). Intensive study of the outstanding literary works of the Middle Ages. Course work in French.


518 Studies in Eighteenth-Century Literature (3:3:0). Selected writers, works, themes, or trends of French literature in the eighteenth century. Content varies. Course work in French. May be repeated for credit with permission of department.

519 Studies in Nineteenth-Century Literature (3:3:0). Selected works, themes, genres, and authors of nineteenth-century French literature. Content varies. Course work in French. May be repeated for credit with permission of department.

525 Studies in Modern French Literature (3:3:0). Selected writers, works, themes or trends of French literature in the modern era. Content varies. May be repeated for credit with permission of department. A maximum of six hours of credit may be earned. Course work in French.

550, 551 Special Topics (3:3:0), (3:3:0). Specialized topics relating to French culture and literature. Content varies. Course work in French.


561 Old French (3:3:0). Study of Old French phonology, morphology, syntax, and lexicon, aimed at preparing students to read medieval French literature in original versions. Linguistic study complemented by reading of Old French verse and prose texts from the ninth through the thirteenth centuries.


575 Grammatical Analysis (3:3:0). Study of characteristic features of contemporary French. Examination of spoken and written French, including syntactic analysis, distributional analysis, and generative-transformational grammar. Emphasis on problems areas for the American learner.

576 Advanced Translation (3:3:0). Advanced work in translation of topics selected from the humanities, the social and political sciences. Comparative terminology, sight translation, and precis writing. The importance, function, and techniques of documentation in translation. Translations from French to English and English to French.


798 Directed Reading and Research (3:0:0). Prerequisite: Open only to degree students who have completed at least 18 credit hours. Reading and research on a specific project under the direction of a department member. Oral or written report required.

799 Thesis (3-6:0:0). Students who take FREN 798 and then elect the thesis option receive three credits for FREN 799 upon completion of the thesis. Students who do not take FREN 798 receive six credits for FREN 799 upon completion of the thesis.

800 Studies for the Doctor of Arts in Education (varied credit). Prerequisite: D.A.Ed. admission to study in French. Program of studies designed by the student's discipline director and approved by the student's doctoral committee to prepare the student to do research and writing in the current area of interest of the discipline director. The student presents a research paper in a subsequent D.A.Ed. summer seminar. May be repeated as required.

Also see FRLN listings.

German (GERM)

518 Studies in Eighteenth- and Early Nineteenth-Century German Literature (3:3:0). Major authors, movements, and themes in eighteenth- and early nineteenth-century German literature. Literary theory and practice, historical background and critical reception. May be repeated for credit with permission of department.

525 Studies in Modern German Literature (3:3:0). Writers, themes, or genres of modern German literature. May be repeated for credit with permission of department.

550 Special Topics (3). Study of a special topic in German language, literature, or culture. Specific topics are announced in advance. May be repeated for credit with permission of department.

560 History of the German Language (3:3:0). Development of the German language from the eighth century to the present. Phonological, morphological, and syntactic structures characteristic of the various stages of development.

798 Directed Reading and Research (3:0:0). Prerequisite: Open only to degree students who have completed at least 18 credit hours. Reading and research on a specific project, under the direction of a department member. Oral or written report required.

799 Thesis (3-6:0:0). Students who take GERM 798 and then elect the thesis option receive three credits for GERM 799 upon completion of the thesis. Students who do not take GERM 798 receive six credits for GERM 799 upon completion of the thesis.
Areas of Study

800 Studies for the Doctor of Arts in Education (varied credit). Prerequisite D. A. Ed. admission to study in German. Program of studies designed by student's discipline director and approved by student's doctoral committee which prepares the student to do research and writing in the current area of interest of the discipline director. The student presents a research paper in a subsequent D. A. Ed. summer seminar. May be repeated as required.

Also see FRLN course listings.

Spanish (SPAN)

500 History of the Spanish Language (3:3:0). Scientific study of the evolution of the Spanish language from its origin in vulgar Latin to its present forms.

501 Applied Spanish Grammar (3:3:0). Analysis of Spanish grammar as a basis for teaching language skills. Terminology and methodology for the teaching of syntax are stressed.

502 Hispanic Sociolinguistics (3:3:0). Introduction to sociolinguistics with emphasis on bilingualism and language contact in the Spanish-speaking world including the United States.


520 Studies in Medieval Spanish Literature (3:3:0). Intensive study of a major work or a literary genre of this period.

525 Studies in Renaissance Literature (3:3:0). Study of a literary movement or selected authors of the Spanish Renaissance.


540 Studies in Nineteenth-Century Literature (3:3:0). Study of a writer, genre, theme, or movement of this period.

545 Studies in Hispanic Literature (3:3:0). Study of major writers in a particular generation or movement.

551 Special Topics in Spanish (3:3:0). Special studies in Spanish or Latin American language, literature, or culture. Specific topics are announced in advance. May be repeated for credit with permission of department.


565 Studies in Spanish American Drama (3:3:0). Study of playwrights who have made a major contribution to the development of the genre.

576 Advanced Translation (3:3:0). Prerequisite Graduate standing or permission of instructor.

Advanced work in translation of selected texts from diverse fields. Comparative terminology, sight translation, and precise writing. Emphasis on the function and technique of documentation in translation. Translation from Spanish to English and from English to Spanish.

580 Contemporary Hispanic Institutions (3:3:0). In-depth study of twentieth-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.

635 Seminar in Don Quixote (3:3:0). Intensive study of Don Quixote and the major critical approaches to the work.

650 Seminar in Twentieth-Century Drama (3:3:0). Study of major dramatists in the Generation of 1898 and in the contemporary theater.

655 Seminar in Twentieth-Century Prose (3:3:0). Intensive study of a major writer, theme, or movement in the novel or the essay.


675 Seminar in Literature and Art (3:3:0). Comparative analysis of a literary theme or style in relation to other media (e.g., painting, architecture, film) for an integral understanding of the arts.

680 Seminar in Literature and Society (3:3:0). Intensive 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.

685 Seminar in Literature and Ideas (3:3:0). Study of major ideological-philosophical themes and their artistic expression in literature.

798 Directed Reading and Research (3:0:0). Prerequisite Open only to degree students who have completed at least 18 credit hours. Reading and research on a specific project, under the direction of a department member. Oral or written report required.

799 Thesis (3-6:0:0), (3-0:0). Students who take SPAN 798 and then elect the thesis option receive three credits for SPAN 799 upon completion of the thesis. Students who do not take SPAN 798 receive six credits for SPAN 799 upon completion of the thesis.

800 Studies for the D.A.Ed. (variable credit). Prerequisite D.A.Ed. admission to study in Spanish. Studies designed by student's discipline director and approved by student's doctoral committee which prepare the student to do research and writing in the current area of interest of the discipline director. The student presents a research paper in a subsequent D.A.Ed. summer seminar. Enrollments may be repeated.

Also see FRLN listing.
Geographic and Cartographic Sciences

Faculty
Andrews, Alice C., Ed.D., George Washington University, 1975; Associate Professor
Fonseca, James W., Ph.D., Clark University, 1974; Associate Professor
Haack, Barry N., Ph.D., University of Michigan, 1977; Associate Professor
Lindberg, Mark B., Ph.D., University of Kansas, 1987; Assistant Professor
Rundstrom, Robert A., Ph.D., University of Kansas, 1987; Assistant Professor

Geographic and Cartographic Sciences, M.S.
The Master of Science in Geographic and Cartographic Sciences is offered by the Department of Public Affairs. The program is designed to provide training for students with different professional goals. Students may prepare for further study or for a variety of careers in geography and cartography with federal agencies, state and local government agencies, private corporations, and educational institutions.

Admission Requirements
In addition to meeting all Graduate School requirements for admission, students should have a bachelor’s degree in geography, cartography, or equivalent. An applicant without an undergraduate degree in geography or cartography may be required to take one course in each of the following: physical geography, human geography, regional 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 geography and cartography.

Degree Requirements
In general, students must complete a program consisting of five required core courses and a number of optional electives that are selected in consultation with an adviser. The required core courses are:
GECA 553 Geographic Information Systems
GECA 579 Remote Sensing
GECA 585 Quantitative Methods

GECA 652 Computer Applications
GECA 680 Seminar in Thought and Methodology

In addition to these core courses, students select from a number of GECA electives to complete their programs. With departmental approval, up to six hours of course work from closely related disciplines may also be applied to the degree. A thesis is optional and students may complete a 33-hour program that includes 6 hours of thesis, or they may complete a 36-hour program without a thesis. If the nonthesis option is selected, students are required to submit two papers as evidence of research proficiency at the graduate level. These papers are included in the student’s permanent file.

Geographic and Cartographic Sciences (GECA) Courses

Department of Public Affairs
503 Problems in Environmental Management (3:3:0). Prerequisite 6 hours of geography, including GEOG 102. Case studies of the impacts of human activities on atmospheric, hydrologic, geomorphic, and biotic processes.

505 Transportation Geography (3:3:0). Prerequisite 6 hours of geography. Structure, principles, location, and development of world transportation. Critical role of transportation in moving people, goods, and ideas at the international, national, regional, and urban levels.

520 Geography for Teachers (3:3:0). Prerequisite Graduate standing or permission of instructor. Emphasis on problems and techniques in teaching geography and current developments in research, methodology, and philosophy in the discipline.

540 Medical Geography (3:3:0). Prerequisites Graduate standing or permission of department and a course in statistics. Spatial approaches to the study of health and disease. Topics covered include disease ecology, disease diffusion, and geographic perspectives on improved health care delivery.

551 Thematic Cartography (3:3:0). Prerequisite Graduate standing or permission of instructor. Analysis of the conceptual and perceptual properties of thematic maps. Emphasis on discussion of these properties in relation to problems in data manipulation, design, and map comparisons.

553 Geographic Information Systems (3:3:0). Prerequisite Course in computer science and graduate standing, or permission of department. Sources of digital geographic information, methods of storage and processing for cartographic display and geographical analysis.

554 History of Cartography (3:3:0). Prerequisite Graduate standing or permission of department. History of cartographic portrayal of the earth from ancient times through the nineteenth century, with emphasis on the interrelation of human culture, technological development, and geographical knowledge as reflected in maps.
552 Analytic Photogrammetry (3:3:0). Prerequisite GEG 414, a course in matrix algebra and graduate standing, or permission of department. Analytic treatment of photogrammetric problems, including least squares adjustments, image coordinate refinements, collinearity equation, resection, relative orientation, and analytic aeriatriangle.

579 Remote Sensing (3:3:0). Prerequisites Course in physical geography or geology and course in aerial photo interpretation, or permission of instructor. Analysis of the nature of electromagnetic radiation, principles and operations of sensors, techniques and systems of correction, enhancement, and production of imagery. Interpretation and applications in geomorphic, atmospheric, hydrologic, vegetation, land use and regional analysis.

580 Digital Remote Sensing (3:3:0). Prerequisite GEG 416 or GECA 579 or permission of instructor. Examination of the theory and techniques of using digital remotely sensed data for obtaining geographic information of the earth’s surface. This includes both image enhancement methods and classification strategies for a variety of physical and cultural features.

581 World Food and Population (3:3:0). Prerequisite Graduate standing or permission of instructor. Topics include maldistribution of population, regional disparities in growth rates and income distribution, food production and world hunger. Discussion of population policies, with emphasis on Third World countries.

583 Spatial Dynamics of Political Systems (3:3:0). Prerequisite Graduate standing or permission of instructor. Topics include territoriality, reapportionment, spatial allocation of public facilities, perception of boundaries. Emphasis on the spatial impact of political process upon land use.

585 Quantitative Methods (3:3:0). Prerequisite Course in statistics or permission of department. Survey of quantitative methods commonly used in geographic research. Emphasis on spatial analysis techniques.

590 Selected Topics in Geography and Cartography (3:3:0). Prerequisite Graduate standing or permission of department. Designed to analyze topics of immediate interest. Content varies.

601 Human Ecology and the City (Same as SOCI 621) (3:3:0). Prerequisite Graduate standing. Introduction to urban ecology. Origin and development of various types of cities; shape and structure of urban areas; inner and outer city and spatial patterning of urban institutions.

652 Computer Applications (3:3:0). Prerequisite GEG 310 or equivalent and course in computer programming or permission of instructor. Examination of computer applications for display and analysis of geographical data.

655 Map Design (3:3:0). Prerequisite GEG 310 or equivalent or permission of instructor. Advanced examination of principles of map design, including discussions of map design research.

656 Terrain Mapping (3:3:0). Prerequisite GEG 310 or equivalent or permission of instructor. Advanced methods of relief and landform portrayal, slope mapping, digital terrain models and other forms of terrain representation.

660 Geodetic Cartography (3:3:6). Prerequisites GEG 310 or 413 or equivalent and course in calculus, or permission of instructor. Introduction to science of earth measurement, methods of establishing geodetic control for mapping and geodetic basis of map projections and coordinate systems.

661 Map Projections and Coordinate Systems (3:3:0). Prerequisites GEG 310 or equivalent and course in calculus or permission of instructor. Development of various map projections and coordinate systems; analysis of their properties, distortions, and applications.

670 Applied Climatology (3:3:0). Prerequisite Course in weather and climate or permission of instructor. Application of climatic concepts to natural and man-modified environments. Analysis of climatic change.


698 Directed Readings and Research (1-3:0:0). Prerequisite Permission of program director and instructor. Reading and research on a specific topic, under the direction of a faculty member. Written report is required; oral exam and report may be required. May be repeated.

785 Geographic Fieldwork (3:3:0). Prerequisite Acceptance to degree status or permission of department. Introduction to the nature, scope, and objectives of geographic field methods and
techniques, including the use of base maps, acquisition of data, and field research design. The course is taught, as much as possible, in field situations with the students required to develop and carry out relevant field research projects pertaining to both physical and cultural geography.

795 Seminar in Regional Analysis (3:3:0). Analysis and synthesis of physical and cultural elements of geography in a selected region. Should be taken near the end of the master's degree program and should provide an opportunity for the student to apply selective knowledge gained in previous systematic courses to a specific region.

799 Thesis (3-6:0:0). Prerequisite degree candidacy and departmental approval of thesis proposal.

Health Education

Faculty
Bever, David L., Ph.D., Purdue University, 1978; Associate Professor
Bunker, John F., D.Sc., Johns Hopkins University, 1983; Research Associate Professor
Cooper, John H., P.E.D., Indiana University, 1955; Professor
Metcalf, James A., Ph.D., University of Maryland, 1970; Associate Professor

Health Education, M.Ed.
The program leading to a Master of Education degree in Health Education is designed to serve teachers, community health agency personnel, and health promotion workers in business and industry.

Admission Requirements
In addition to fulfilling the Graduate School admission requirements, the applicant must hold a bachelor's degree in health education or a related field, must submit three letters of recommendation and transcripts of all college course work, and must have completed courses in biology, human anatomy, and physiology. Applicants who do not meet these requirements may be offered provisional or nondegree status in accordance with general regulations of the Graduate School.

Degree Requirements
In addition to fulfilling the Graduate School degree requirements, the candidate must complete the following program:

Core Courses
HEAL 500 Workshop Courses (3-6)
HEAL 511 History and Philosophy of Health Education (3)
HEAL 513 Current Issues in Health Education (3)
HEAL 516 Program Development and Resources in Health Education (3)
HEAL 517 Health Education Process: School and Community (3)
PHED 610 Advanced Exercise Physiology and Sports Medicine (3)
HEAL 612 Scientific Foundations of Health and Fitness (3)
PHED 630 Exercise, Health and Fitness Program Development (3)
EDUC 590 Education Research (3) or EDUC 591 Education Statistics (3)

http://catalog.gmu.edu
HEAL 798 Special Project (3) or
HEAL 799 Thesis (3-6)

Electives (3-6)
Successful Completion of Written Comprehensive Examination

Total: 36

Graduate Assistantships
Administrative, research, and teaching related graduate assistantships are available in the health education program. To be eligible for an assistantship, a student must be admitted to degree status and take a minimum of six semester hours of graduate credit each semester.

Health Education Courses (HEAL)

500 Workshop in Health Education (1,2,3:0:0).
Analysis of selected health problems and issues involving readings, research, and group attention.
Six semester hours of HEAL 500 may be applied to degree.

511 History and Philosophy of Health Education (3:3:0).
Focus on evaluation of significant historical events that affected and contributed to health education development.
Emphasis on personalities, institutions, and philosophical ideas of each area.

513 Current Issues in Health Education (3:3:0).
Analysis of topical and often controversial health issues with emphasis on selected problems of concern to society.

516 Program Development and Resources in Health Education (3:3:0).
Prerequisite Baccalaureate degree in health education or related field or permission of instructor.
Procedures used in planning, development, and organization of health education programs in school and health agency settings.

517 Health Education Process: School and Community (3:3:0).
Prerequisite Baccalaureate degree in health education or related field or permission of instructor. Examination of the health education process in a variety of health promotion, disease prevention, and rehabilitative settings.

540 Advanced Driver and Traffic Safety Education (3:3:0).
Prerequisite 3-hour basic course in driver education; course in general safety education on college level; valid operator's license. Advanced course in driver education for teachers, supervisors, and administrators of driver education and traffic safety programs.

599 Independent Study in Health Education (1-3:0:0).
Prerequisite Permission of department.
Study of a problem area in health education research, theory or practice under direction of faculty. May be repeated, but no more than three hours total credit may be earned.

612 Scientific Foundations of Health and Fitness (3:3:0).
An integrated study of human anatomy, physiology, chemistry, and microbiology, presenting a complete picture of how the body functions and the diseases and disorders that cause the body to malfunction.

798 Project (3:0:0).
An individualized project applying appropriate methodology to a health problem or issue. Under supervision of graduate faculty member(s).

799 Thesis (3-6:0:0).
Exploration of a health problem using appropriate research methodology under supervision of graduate faculty member(s).
Proposal must be approved prior to enrollment for thesis credit.
History

Faculty

Bakhash, Shaul, Ph.D., Oxford University, 1972; Robinson Professor
Bodeker, Hans E., Ph.D., Ruhr University, Bochum, Germany, 1981; Visiting Professor
Cassara, Ernest, Ph.D., Boston University, 1957; Professor
Censer, Jack R., Ph.D., Johns Hopkins University, 1973; Associate Professor
Cohen, Martin B., Ph.D., The George Washington University, 1975; Assistant Professor
Demin, Desmond, Ph.D., National University of Ireland, 1985; Visiting Assistant Professor
Diner, Steven J., Ph.D., University of Chicago, 1972; Professor
Duara, Prasenjit, Ph.D., Harvard University, 1983; Assistant Professor
Gleissner, Richard A., Ph.D., University of Maryland, 1968; Associate Professor
Harsh, Joseph L., Ph.D., Rice University, 1970; Associate Professor
Hawkes, Robert T., Jr., Ph.D., University of Virginia, 1975; Assistant Professor
Henriques, Peter R., Ph.D., University of Virginia, 1971; Associate Professor
Holsinger, Donald C., Ph.D., Northwestern University, 1979; Associate Professor
Jensen, Ronald J., Ph.D., Indiana University, 1971; Associate Professor
Lytton, Randolph H., Ph.D., Pennsylvania State University, 1973; Associate Professor
Pacheco, Josephine F., Ph.D., University of Chicago, 1950; Professor
Rosenzweig, Roy A., Ph.D., Harvard University, 1978; Associate Professor
Saeed, Mian M., Ph.D., University of London, 1965; Associate Professor
Soder, John P., Jr., Ph.D., Georgetown University, 1970; Associate Professor
Spence, Vernon G., Ph.D., University of Colorado, 1968; Professor
Stewart, Jeffrey C., Ph.D., Yale University, 1979; Assistant Professor

History, M.A.

This program is designed to help students understand the discipline of history and to master the methodology of the historian. The program is divided into four tracks and is designed to serve different student needs as outlined in the degree requirements.

Admission Requirements

An applicant for admission to the Master of Arts in History program must fulfill the admission requirements of the Graduate School and the Department of History, including the following: (1) Scores in the GRE, including the subject examination in history. Even for those who have had little or no history, the area exam is required to evaluate deficiencies. This requirement, at the discretion of the department, may be waived when a baccalaureate degree is 10 or more years old or when the applicant possesses another master’s degree. (2) Two letters of recommendation from professors of history with whom the applicant has studied, or from others directly familiar with the applicant’s professional competence and interests.

Degree Requirements

Track I, Predoctoral. This track is intended for students who desire the proper background for doctoral studies. To remedy possible deficiencies in a student’s undergraduate study, up to 21 semester hours of foundation courses (HIST 550, 601-606, Themes in U.S., Latin American, or Modern European history) may be required. In addition, each candidate must successfully complete a minimum of 30 semester hours of graduate-level work with a GPA of not less than 3.00 as follows:

1. Three semester hours of HIST 610, The Study and Writing of History (to be taken within the first nine hours of course work);

2. Twelve semester hours in a major field of concentration (U.S., Latin American or Modern European History), including a research seminar and specialized readings (specialized readings is an individualized readings course designed by the student and a professor in the last semester of course work to round out the student’s general historical knowledge);

3. Nine semester hours in a second field of history. Minor fields in U.S., Latin America, Modern Europe, and World Regions in the Modern Period. The candidate must also:

1. Demonstrate reading proficiency in a modern foreign language;

2. Pass a written comprehensive exam;

3. Complete a thesis (six semester hours).

http://catalog.gmu.edu
Areas of Study

Track II, Applied History. This track is designed for the student who desires to develop expertise in such applied history fields as archival management, museum studies, historic preservation, and editing. This degree would also be suitable for persons professionally employed as historians in business or government who desire to further their professional careers. To remedy possible deficiencies in a student's undergraduate study, up to 21 semester hours of foundation courses (HIST 550, 601-606, Themes in U.S., Latin American, or Modern European history) may be required. In addition, all candidates must successfully complete a minimum of 30 semester hours of graduate-level work with a GPA of not less than 3.00 as follows:

1. Three semester hours of HIST 610. The Study and Writing of History (to be taken within the first nine hours of course work);
2. Fifteen semester hours in a major field of concentration (U.S., Latin American, or Modern European History), including a research seminar and specialized readings (specialized readings is an individualized readings course designed by the student and a professor in the last semester of course work to round out the student's general historical knowledge);
3. Six semester hours in applied areas courses, e.g., museum studies, archives, historical editing;
4. Six semester hours of internship;
5. Pass a written comprehensive exam.

Students must also demonstrate a proficiency in the use of one relevant research tool, i.e., modern foreign language, computer language, or statistics.

Track III, Enrichment. This track is intended for a student who wishes to study history for vocational, avocational, or intellectual self-fulfillment. While a bachelor's degree is necessary to enter this program, it need not be in history. To remedy possible deficiencies in a student's undergraduate study, up to 21 semester hours of foundation courses (HIST 550, 601--606, Themes in U.S., Latin American, or Modern European history) may be required. In addition, all candidates must successfully complete a minimum of 30 semester hours of graduate-level work with a GPA of not less than 3.00 as follows:

1. Three semester hours, HIST 610. The Study and Writing of History (to be taken within the first nine hours of course work).
2. Fifteen semester hours in a major field of concentration (U.S., Latin American or Modern European history), including a research seminar and specialized readings (specialized readings is an individualized readings course designed by the student and a professor in the last semester of course work to round out the student's general historical knowledge).
3. Twelve hours of electives.
4. Six semester hours, HIST 799 (thesis) is optional. If a thesis is elected, then three hours in the major and three hours in electives will be assigned to it.
5. Pass a written comprehensive exam. No relevant research tool is required.

Track IV. M.A. in History, with Emphasis on Teaching (formerly M.A. in Teaching History). In addition to fulfilling the admission requirements of the Graduate School, applicants for this degree should have majored in history. Applicants with undergraduate majors in fields other than history may be admitted if their records demonstrate strong background in history and studies closely related to it. The department may require that undergraduate deficiencies be made up in courses (HIST 550, 601-606) without graduate credit. All candidates must successfully complete 36 semester hours of approved graduate-level course work with a grade-point average of not less than 3.00 as follows:

1. Twenty-four credits in history, including three credits in HIST 610. The Study and Writing of History (to be taken within the first nine hours of course work).
2. Twelve credits in education, including EDCI 567 and EDCI 763.
3. No language requirement.
4. A written comprehensive examination administered by the faculty. Candidates intending to teach at the secondary level must also qualify for the Virginia Collegiate Professional Certificate (or its equivalent) in history.

History Courses (HIST)

520 (670) Social Revolution in Latin America (3:3:0). Analysis of revolutionary forces that are challenging traditional institutions and transforming all aspects of society in contemporary Latin America. Selected countries are studied in depth. This course may not be taken by anyone who has satisfactorily completed HIST 670.

525 (675) Problems in Latin American History (3:3:0). Analysis of selected problems in Latin American history. Emphasis on reading and discussion of historical interpretations and development of bibliography. Maximum of six hours may be earned.

528 (678) Latin American Cultural and Intellectual History, Nineteenth Century (3:3:0). Iberian background and other foreign influences: ideas of independence leaders; midcentury Romanticism, Liberalism, and Traditionalism; secular and religious Positivism; and Marxist socialism. Intellectual developments traced in major Latin American thinkers, writers, and artists. This course may not be taken by anyone who has satisfactorily completed HIST 678.

550 Interpretations of History (3:3:0). Study of development of historical writings in the West from ancient to modern times. Introduction to historical methodology.

555 (655) Problems in Asian History (3:3:0). Subjects announced by instructor. Discussion of readings and historical interpretations and compilation of a comprehensive bibliography on

583 (683) The Cultural History of the Islamic World (3:3:0). Government, science, philosophy, religion, literature, arts and architecture of the Arabs of the Umayyad and Abbasid period, Persians of the Safavid period, Gnazavids of Afghanistan, grand Mughals of India and Pakistan, Timurids of Central Asia, Fatamids of Egypt, Moors of Spain, and the Turks. Important political and cultural movements in different parts of Islamic World are discussed.

585 (685) Problems in Middle Eastern History (3:3:0). Analysis of selected problems in Middle Eastern history. Emphasis on reading and discussion of historical interpretations and development of bibliography. Course may be repeated once when content differs.

601 Themes in United States History I (3:3:0). Survey of U.S. history prior to 1877. Designed for individuals entering the graduate program who need to strengthen their preparation in this area or who seek to enhance their knowledge of the latest interpretations in the field. Factual knowledge and its interpretation will be stressed. This course may not be taken by anyone who has satisfactorily completed HIST 611.

602 Themes in United States History II (3:3:0). Survey of U.S. history since 1877. Designed for individuals entering the graduate program who need to strengthen their preparation in this area or who seek to enhance their knowledge of the latest interpretations in the field. Factual knowledge and its interpretation will be stressed. This course may not be taken by anyone who has satisfactorily completed HIST 612.

603 Themes in Latin American History I (3:3:0). Survey of Latin American history from the pre-Columbian era through the wars for independence. Designed for individuals entering the graduate program who need to strengthen their preparation in this area or who seek to enhance their knowledge of the latest interpretations in the field. Factual knowledge and its interpretation will be stressed. This course may not be taken by anyone who has satisfactorily completed HIST 621.

604 Themes in Latin American History II (3:3:0). Survey of Latin American history since the conclusion of the wars for independence in the early 1820s. Designed for individuals entering the graduate program who need to strengthen their preparation in this area and for those seeking to enhance their knowledge of the latest interpretations in the field. Factual knowledge and interpretation will be stressed. This course may not be taken by anyone who has satisfactorily completed HIST 622.

605 Themes in European History I (3:3:0). Survey of European history from 1500 to 1815. Designed for individuals entering the graduate program who need to strengthen their preparation in this area or who seek to enhance their knowledge of the latest interpretations in the field. Factual knowledge and its interpretation are stressed. This course may not be taken by anyone who has satisfactorily completed HIST 631.

606 Themes in European History II (3:3:0). Survey of European history from 1815 to present. Designed for individuals entering the graduate program who need to strengthen their preparation in this area or who seek to enhance their knowledge of the latest interpretations in the field. Factual knowledge and its interpretation are stressed. This course may not be taken by anyone who has satisfactorily completed HIST 632.

610 The Study and Writing of History (3:3:0). Methodology of the historian, including techniques of research, use of documentation and other sources, development of bibliography, synthesis of material.


614 The Enlightenment in America (3:3:0). Study of Enlightenment as it was reflected in various aspects of American life in the eighteenth and early nineteenth centuries. Impact of the Enlightenment on development of new American nation.

615 Problems in American History (3:3:0). Readings and discussion of bibliographies, interpretations and research trends in topics selected by instructor. Maximum of nine hours may be earned.

616 Attempts to Control the U.S. Westward Movement (3:3:0). Study of attempts by the East to control the West, how and by whom control was attempted, to what extent it was effective, to what extent the need for such control existed, and in what manner the West resisted Eastern domination.

617 Topics in the American Civil War Era (3:3:0). Joint project of instructor and students, into the various aspects of a common topic in the Civil War era with emphasis on historiography and historical method.

618 The Age of Jackson, 1828-1848 (3:3:0). Inquiries, interpretations, and discussions of those elusive qualities of Jacksonian democracy which made the 1820s, 1830s, and 1840s a separate and distinguishable part of the American past. This course, conducted as a seminar, includes readings, discussions, oral reports, and a term paper based upon the issues of that transitional period.

623 Topics in Recent U.S. History, 1945 to Present (3:3:0). Selected political, social, economic, diplomatic, and cultural forces that shaped the post-World War II American experience. Conducted as a seminar.
624 Interpretations in U.S. Diplomatic History (3:3:0). Study of American foreign policy and its analysis by both popular and scholarly interpreters. Conducted as a seminar, with selected issues chosen for special study.


626 Seminar in State and Local History (3:3:0). Prerequisite: HIST 610 or permission of instructor. Exposition of principles and techniques of local history followed by intensive investigation of selected aspects of the region, using area manuscript collections.

627 Urban Development of the United States (3:3:0). Examination of the growth of cities in the United States, the process of urbanization, and the significance of cities in American history. Students will become familiar with major issues and bibliography of American urban history.

635 Problems in European History (3:3:0). Investigation of selected problems in the history of Europe. Readings, discussions, development of bibliographies. Where possible, primary sources are used. Maximum of six hours may be earned.


637 Europe: The Rise of the Nations, 1750-1914 (3:3:0). Focus on changes in social conditions and their ramifications in political life. Attention to urbanization of workers, changes in the peasantry, growth of middle classes, decline of nobility, as well as major political developments and expansion of liberal reforms.

645 The Russian Revolution and the Origins of the Soviet State (3:3:0). The period between 1890 and 1924 with concentration of the sources of Bolshevism, problems of the old regime as they led up to the revolutions of 1905 and 1917, establishment of the new regime and its survival in an environment of foreign and civil war.

679 Seminar on Inter-American Diplomacy (3:3:0). Prerequisite: HIST 610 or permission of department. Seminar on geographic, political, economic, military, and other forces that have influenced inter-American relations. Study of the special relationship between U.S. and Latin America. May be applied toward the major or minor concentration in either U.S. or Latin American history.

690 The Administration of Archives and Manuscripts (3:3:0). Prerequisite: 6 hours of U.S. history or permission of department. Introduction to the principles and practices in the management of records and the administration of archival and manuscript collections, public and private. Designed for graduate students with a special interest in historical sources as well as for those specializing in applied history.

691 Museum Studies (3:3:0). Prerequisite: 6 hours of U.S. history or permission of department. General introduction to museums of history and museum studies in the United States, intended for the interested citizen as well as for assistance to students in course and career choices. Course explores the development, present state, and future possibilities of museums in the United States, with some reference to international developments.

692 Historical Editing (3:3:0). Introduction to the fundamentals of historical editing of documents, including the use of microform, word processing, and computer techniques. Designed for persons seeking an introduction to various areas of applied history and for persons intending to edit historical documents for publication.

693 Historic Preservation (3:3:0). Prerequisite: 6 hours of U.S. history or permission of department. General introduction to historic preservation in the United States, intended for the interested citizen as well as for assistance to students in course and career choices. Course explores the development, present state, and future possibilities of historic preservation in the United States, with some reference to international aspects of preservation.

694 Law, Society and Historical Resources (3:3:0). Prerequisite: 6 hours in field of major historical concentration and 3 hours in applied studies field of concentration or permission of department. General introduction to the processes by which cultural heritage programs are planned, funded, and carried out, and the dynamics of working in and with these processes. Particular attention will be given to program organization for management and funding; legal techniques for creating and using interests in real and personal property, including literary, artistic, and intellectual property; liability for damage and injuries; and strategies for public and private sector support of programs.

695 History Symposium (3:3:0). Subject of academic and community interest pursued through discussions and lectures by distinguished guest instructors.

711 Research Seminar in United States History (3:3:0). Prerequisite: HIST 610 or permission of department. Research in specialized topics using primary sources. Maximum of six hours may be earned.

731 Research Seminar in European History (3:3:0). Prerequisite: HIST 610 or permission of department. Research in specialized topics using primary sources. Maximum of six hours may be earned.
771 Research Seminar in Latin American History (3:3:0). Prerequisite HIST 610 or permission of department. Research in specialized topics using primary sources. Maximum of six hours may be earned.

790 Specialized Readings in United States History (3:3:0). To be taken in the final semester of the program. Designed to integrate the students' past work in the major field and to fill gaps in this area prior to comprehensive exam. After review of graduate experience, student and instructor design a reading list to round out preparation for the exam.

791 Specialized Readings in Latin American History (3:3:0). To be taken in the final semester of the program. Designed to integrate the students' past work in the major field and to fill gaps in this area prior to comprehensive exam. After review of graduate experience, student and instructor design a reading list to round out preparation for the exam.

792 Specialized Readings in European History Since 1500 (3:3:0). To be taken in the final semester of the program. Designed to integrate the students' past work in the major field and to fill gaps in this area prior to comprehensive exam. After review of graduate experience, student and instructor design a reading list to round out preparation for the exam.

794 Internship in Applied History (3-5:0:0). Prerequisite 3 hours of applied history in appropriate area and 12 hours in major field or permission of internship director. All internship placements must be approved by the department to ensure their suitability to the student's program. An introduction to applied history through work and study at a historical museum, site, library archive, editing project, or other approved agency.

796 Directed Readings (3-6:0:0). Independent reading on a topic agreed to by student and faculty member. Maximum of six hours may be earned.

799 Thesis (6:0:0).

800 Studies for the Doctor of Arts in Education (various credit). Prerequisite D.A.Ed. admission to study in history. Program of studies designed by student's discipline director and approved by student's doctoral committee which brings the student to participate in research of discipline director and results in a paper reporting the original contributions of the student. Paper is presented in a subsequent D.A.Ed. summer seminar. Enrollments may be repeated.

---

Information Systems and Systems Engineering

Faculty

Adelman, Leonard, Ph.D., University of Colorado, 1976; Associate Professor
Andriole, Stephen, Ph.D., University of Maryland, 1974; Professor, Department Chair
Aseltine, John, Ph.D., University of California at Los Angeles, 1952; Visiting Professor
Baum, Richard, Ph.D., University of Michigan, 1969; Associate Professor
Beam, Walter, Ph.D., University of Maryland, 1953; Visiting Professor
Das-Gupta, Padmimi, Ph.D., Syracuse University, 1985; Assistant Professor
Fairley, Richard, Ph.D., University of California at Los Angeles, 1971; Professor
Golchoechea, Ambrose, Ph.D., University of Arizona, 1977; Associate Professor
Gomaa, Hassan, Ph.D., Imperial College, 1976; Professor
Hoppie, Gerald, Ph.D., University of Maryland, 1975; Associate Professor
Kerschberg, Larry, Ph.D., Case Western Reserve University, 1969; Professor
Kornreich, Theodore, Ph.D., Polytechnic Institute of Brooklyn, 1965; Visiting Professor
Lehner, Paul, Ph.D., University of Michigan, 1981; Associate Professor
Palmer, James D., Ph.D., University of Oklahoma, 1963; BDM Professor of Information Technology, Associate Dean
Sage, Andrew, Ph.D., Purdue University, 1960; First American Bank Professor, Dean of School of Information Technology and Engineering
Sibley, Edgar, Sc.D., Massachusetts Institute of Technology, 1967; Professor
Stiff, Frederick, Ph.D., New York University, 1974; Associate Professor

Information Systems, M.S.

The Master of Science in Information Systems program (MSIS) provides graduate-level instruction in the design, development, and use of computer systems for information management organizations. Managerial, user interface, and technical aspects of information systems are considered, within application environments, in both private and public sector organizations. A graduate of the MSIS
program will be able to pursue a career in information systems analysis and design, and in managing the development of computer-based management information systems. Through elective courses, the MSIS student may acquire skills in special technical areas, such as management science, information retrieval, decision support systems, software systems engineering, computer languages, artificial intelligence, graphics, robotics, human factors, and simulation. The program is offered by the faculty of the Department of Information Systems and Systems Engineering. Many classes are offered in the late afternoon and evening to accommodate the professionally employed student.

Foundation Requirements
The MSIS program provides strong technical training and basic analysis tools coupled with practical management-oriented applications. To ensure that students have adequate grounding in management disciplines, mathematical methods, and the basic preparation in computer technology, five foundation courses are required. A student who needs to take any of these courses may apply for admission. Upon acceptance, the student will be advised of the necessary foundation courses to be satisfactorily completed, as articulated courses, to meet this requirement. Foundation courses do not earn credit toward the MSIS degree.

These foundation courses are exemplified by the following three George Mason University courses, or equivalent, which are required:
- INFS 610 Computer Systems for Management
- STAT 610 Statistical Foundation for Decision Making
- ACCT 610 Accounting and Reporting

In addition, students must have knowledge equivalent to two of the following courses:
- ECON 602 Economic Analysis
- FNAN 610 Financial Management
- MKTG 610 Marketing Concepts and Practices
- BULE 610 Legal Concepts and Trends Affecting Business
- MGMT 610 Management Theory and Practice

Students may take courses through the Cooperative Graduate Engineering Program in affiliation with the University of Virginia and Virginia Tech. Appropriate courses may be transferred, with adviser approval, into this GMU degree program. Refer to the section on Certificates, Programs, and Additional Graduate Courses in this catalog.

Admission Requirements
Applicants for the MSIS program should meet the following minimum entrance requirements:

1. Hold a baccalaureate degree from an accredited institution.
2. Have earned a grade-point average of 2.9 or better in the last 60 hours.
3. Show proof of a satisfactory score on the Graduate Management Admission Test (GMAT) or the Graduate Record Exam (GRE). The applicable test should have been taken within five years of applying for admission. The GRE/GMAT requirement is waived if the applicant already has a master's degree.

4. Submit the appropriate application form with three letters of recommendation from persons directly knowledgeable of the applicant's professional and academic competence. Note that the MSIS self-evaluation form is essential to evaluation of foundation requirements by the department faculty.

Advising. Each student admitted to the program is assigned a faculty adviser with whom the student confers on matters related to degree requirements. A plan of study for the MSIS degree should be completed and submitted by the student soon after admission to the program.

Degree Requirements
Completion of the MSIS program requires a minimum of 30 approved graduate semester hours (ten courses). This requirement is satisfied by the following:

Required Courses. To provide a common background in the fundamentals of information systems, the following courses are required of all students:
- DESC 611 Quantitative Analysis in Business and Operations Management
- ORAS 500 Mathematical Foundations for Management Science and Systems Analysis
- ORAS 540 Management Science
- INFS 690 Program Design and Data Structures
- INFS 790 Information Systems Policy and Administration

Students must also take at least three of the following four courses:
- INFS 710 Computer Architecture and Operating Systems
- INFS 712 Data Communications and Distributed Processing
- INFS 714 Database Management Systems
- INFS 722 Information Systems Analysis and Design

Electives. To allow for individual variations in interest, students may elect three courses in consultation with their adviser. A thesis option is available; students may elect to complete a thesis for six hours of elective credit.

The following courses are acceptable electives for the degree without prior adviser approval:
- INFS 711, 720, 723, 780, 791, 792, 796
- CS 540, 580, 612
- DESC 535
- IRM 760

To complete a master of science degree, students will complete an approved plan of study. The plan, which serves as a learning contract between the student and the University, must contain a minimum of 30 semester hours of graduate-level course work.
Systems Engineering, M.S.

The graduate program leading to a Master of Science in Systems Engineering is designed to equip students for research and professional practice associated with problem formulation, issue analysis, and evaluation of the consequences of alternative courses of action as they pertain to the design and development of systems of all kinds. The program emphasizes the analytical and behavioral aspects of engineering complex systems of large scale and scope. Students are expected to become proficient in operations research and applied statistics, which supplies an important quantitative basis for systems analysis. Cognitive aspects of systems engineering, systems design methodology, and systems management are also essential studies.

To achieve this objective, the program includes four core courses, electives selected by the student with the aid of a faculty adviser, and a thesis or systems engineering project. To earn the master of science degree, students must complete an approved plan of study. The plan, which serves as a learning contract between the student and the University, must contain at least 30 semester hours of graduate-level course work. Either a thesis or a research project is required for the degree.

Articulation requirements for candidates needing additional work in mathematics or engineering will also be included in the plan of study.

Students may take courses through the Cooperative Graduate Engineering Program in affiliation with the University of Virginia and Virginia Tech. Appropriate courses may be transferred, with adviser approval, into this GMU degree program. Refer to the section on Certificates, Programs, and Additional Graduate Courses in this catalog.

Admission Requirements

In addition to the general admission requirements, the academic background requirements for entrance into the program include (1) an undergraduate degree in engineering, mathematics, physical sciences, economics, psychology, or a related field in which the applicant has successfully completed foundation courses in calculus through differential equations, applied probability and statistics, and a scientific programming language; (2) scores from the Graduate Record Examination (GRE).

Acceptance to the degree program is based on an assessment of the applicant’s capacity to successfully pursue the graduate program, and on factors such as the undergraduate record (a grade-point average of at least 2.9 is required) and professional work experience. Well-qualified students who present minor admissions deficiencies may be admitted subject to completing an articulation program. To this end, students applying to the program are asked to complete a self-assessment form. The primary purpose of this is to ascertain prior background in quantitative methods for engineering systems analysis and design, related engineering problem-solving approaches, and fluency in computer usage. The articulation program, when required, will consist of up to three graduate courses that provide preparation for further graduate study through intensive study in these areas.

Degree Requirements

To obtain a Master of Science degree in Systems Engineering, students must complete an approved plan of study with a minimum of 30 semester hours of graduate-level courses and research. Required courses, constituting 18 credits, are as follows:

1. Two courses in systems engineering concepts and methods (6 semester hours);
2. Two courses in operations research and applied statistics (6 semester hours);
3. Project or thesis.

Option A—SYST 798. Master’s Systems Engineering Project (6 hours), plus four elective graduate-level courses (12 hours)

Option B—SYST 799. Master’s Independent research (6 hours), plus four elective graduate-level courses (12 hours)

Option C—SYST 798, Individual Project (3 hours), plus five elective graduate level courses (15 hours)

Option A, the master’s systems engineering project, is designed to permit the student to carry out systems engineering analysis and design, usually within a multidisciplinary group, under the guidance of faculty members. The emphasis is on bringing a range of skills to bear on a complex, realistic system problem. The final product of the work is a professionally accomplished technical report dealing with a predefined portion of the project activity, and is submitted to the project adviser. During the first semester, the student operates in a supporting role on a phase of the project, and in the following semester assumes primary responsibility for a segment of the project. Although more than six semester hours registration in SYST 798 is possible, only six credits of this registration may be applied toward the degree.

Option B requires a master’s thesis and involves a significant independent research effort. The work is conducted under the guidance of a faculty adviser, and the final written thesis and oral defense are approved by a three-member faculty committee and submitted through the School of Information Technology and Engineering to the dean of the Graduate School. The thesis work is expected to be completed while taking six semester hours of SYST 799. Master’s Thesis Research. Although more than six semester hours’ registration in SYST 799 is possible, only six credits of this registration may be applied toward the degree.

Option C is directed toward students who are employed in systems engineering work, and who consequently would benefit less from the group-intensive experience which is the objective of Option A. A project objective may be selected with the approval of the faculty adviser, usually directed toward analysis of system requirements, development of a prospective system architecture, or use and evaluation of system engineering methodologies. A project report is submitted at the
Areas of Study

end of the semester while registered for SYST 798, and must be approved by the department faculty prior to award of the master's degree.

Curriculum

Systems Engineering Core Courses (6 credits)
SYST 660 Systems Engineering I (Methodology, Analysis & Design)
SYST 661 Systems Engineering II (Economic Systems Analysis)
Operations Research and Applied Statistics (6 credits)
STAT 610 Statistical Foundation for Decision Making
(OR 541 Operations Research I (or approved alternative, for advanced students))
Electives (12-15 credits)
The student should select electives based on personal objectives, developed with the aid and approval of the faculty adviser. It is suggested that no more than two areas of elective study be divided between the 12 semester hours, so that some depth of study in an area may be achieved.
Although many students choose electives from within the SITE departments, selected courses offered by other academic units at GMU are also appropriate.

Appropriate areas of specialization include, but are not limited to the following:
Command and Control Systems Design
Expert Systems and Decision Support Systems
Software Systems Engineering
System Level Architecture
Systems Design and Systems Management Management
Of particular interest to students planning a Ph.D. program in information technology is the set of electives which compose the doctoral core study. Students may wish to include some of these courses in their systems engineering master's plan of study.
Starting in fall 1988, students in the systems engineering and the computer science programs may pursue a specialization in software systems engineering. To complete the software engineering track, students must complete the required courses and Option A, B or C in systems engineering; within Option A, B or C students must complete four graduate-level SYST courses in software engineering rather than completing four electives. The four SYST courses to be completed are SYST 560, Introduction to Software Systems Engineering; SYST 665, Formal Methods and Models; SYST 670, Requirements Analysis, Prototyping, and Design; and SYST 685, Software Project Management.

Information Systems Courses (INFS)

610 Computer Systems and Software (3:3:0).
Prerequisite Graduate standing. Examination of information systems. Lecture and computing lab, including programming in a structured language, such as C or Pascal. Fall, spring, summer.

690 Program Design and Data Structures (3:3:0). Prerequisite Acceptance into MSIS program and INFS 610 (formerly BUAD 580).
Study of the fundamentals of data structures and algorithms applied in programming solutions to application problems. Stresses structured programming in a modern high-level language. Laboratory required. This is the first course in the MSIS program and a prerequisite for all other courses.

699 Advanced Topics in Information Systems (3:3:0). Prerequisite INFS 690.
Special topics not occurring in the regular INFS sequence will be presented. May be repeated for credit where distinct offerings of the course differ in subject.

Fundamentals of technology evaluation for the hardware and software architecture of management information systems. Focuses on modern microprocessor design, assembly language, operating system concepts and their interrelationships. Computing lab.

711 Comparative Programming Languages (3:3:0). Prerequisite INFS 710.
Investigation of the variety of environments for computer applications. Selection of the appropriate computing language for a specific application is demonstrated through case studies. Examples of languages are C, Assembler, PASCAL, COBOL, PL/I, FORTRAN, ADA, LISP, Prolog. Computing lab.

712 Data Communications and Distributed Processing (3:3:0). Prerequisite INFS 710, DESC 611.
Concepts and applications of telecommunications technologies, networks and distributed information systems. Includes regulatory issues, network pricing and management. Case studies.

714 Database Management (3:3:0). Prerequisite INFS 710.
Generalized database management systems: their internal and external structure, development, implementation, management and use. Covers logical and physical database design and access methods. Several commercial systems are examined. Computing lab.

720 Systems and Information Analysis in Organizations (3:3:0). Prerequisite INFS 690.
Analysis of information flow in organizations and the operating context of the various computer-based subsystems of an organizational information system. Fundamental concepts of systems and information are integrated with those of organizational structure and management.

722 Information Systems Analysis and Design (3:3:0). Prerequisite INFS 714, with INFS 712 also recommended. Integration of computing technologies, systems analysis, system design practices and management criteria in the design of large scale information management and decision support systems. Cases and computing lab.

http://catalog.gmu.edu
723 Information Retrieval (3). Prerequisite INFS 714. This course examines models and theories used for the design of information systems for textual and less well structured data bases; covering hardware, software and the design, implementation and evaluation of such systems. Laboratory (computer programming).

780 Technical and Administrative Issues in Office Automation (3:3:0). Prerequisite INFS 690 (may be taken concurrently). Examines office automation as an issue in applying the concepts of MIS in an organization. Focuses on technical issues of hardware and software selection as well as administrative problems associated with successful integration of the appropriate technologies. Lecture and major class project.

790 Information Systems Policy and Administration (3:3:0). Prerequisite Completion of all course work for the M.S. in Information Systems. Capstone course, integrates the technical and executive policy issues of information systems. Critical executive issues are examined through case studies and comprehensive individual project. Computing lab.

791 Special Topics in Group Project Design (3). Prerequisites INFS 690 and INFS 710 (may be taken concurrently). Study of techniques for managing a software engineering or information systems design project. The student selects a project and prepares a detailed project plan with professional guidance. The plan developed in this course will be used in practice in the follow-on course, INFS 792.

792 Special Topics in Group Project Implementation (3). Prerequisites INFS 690, INFS 710, INFS 791. Study of the various techniques for managing a computer-based information system design project. Using the project plan developed in INFS 791, students implement the project with undergraduate students enrolled in INFS 492 as group members.

796 Directed Readings. Prerequisite Graduate degree students in information systems with at least 12 prior credit hours in INFS and CS courses. Research and analysis of a contemporary problem in information system development. Prior approval required by a faculty sponsor who supervises the student's work. Written report or thesis proposal to be prepared.

799 Thesis. Prerequisite 18 hours of credit applicable toward M.S. in CS. Original or compiary work evaluated by a committee of three faculty members.

**Systems Engineering Courses (SYST)**


560/CS 560 Introduction to Software Systems Engineering (3:3:0). Prerequisite Admission to the MSCS or MSSE program or permission of instructor. The software product lifecycle. Process models and metrics. Modern language concepts, including information hiding, inheritance, message passing, and concurrency as exemplified by Ada and other current languages. Design, implementation, and validation of software systems using the Ada programming language. Computer-based tools to support modern software development practices are emphasized.

624 (522) Computer Control Systems (3:3:0). Prerequisite ECE 421 and 521 or permission of instructor. 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. The course may include a simulation and design project.

570 Quality Control (3:3:0). Prerequisite Course in statistics. Statistical and managerial techniques applied to quality control and assurance in both manufacturing and nonmanufacturing applications. Topics include quality considerations in design, process vs. design tolerances, acceptance sampling, control chart methodology, and applications.

659 Judgment and Choice Processing and Decision Making (3:3:0). Intuitive nature of human judgment and decision making, and some methods currently being used for improving individual and group decision. The nature of judgment emphasizing limitations on human information processing abilities. The use of decision-analytic techniques to improve decision making.

660 Systems Engineering—Methods and Design (3:3:0). Prerequisite ENGR 390, MATH 351, or permission of instructor. Introduction to analysis, design, test, implementation, and management of systems. System life cycle, cost/benefit and analysis, comparison of alternatives, and human/social implications are examined.

661 Systems Engineering—Economic Analysis (3:3:0). Prerequisites MATH 351, MATH 304. Introduction to the construction of differential and difference equation models occurring in systems engineering and their solution by transform methods. Elements of system control life cycle and cost–benefit analysis are discussed.

675 Reliability Analysis (3:3:0). Prerequisite STAT 654 or equivalent. Introduction to the concept of system reliability and its relationship to product quality, maintenance costs, and safety engineering. A series of topics are developed that incorporate the statistical and mathematical point of view in reliability as a means of helping students develop the capability to design, model, and make inferences on complex systems.

http://catalog.gmu.edu
Areas of Study

760 Command Control and Communications Systems Engineering (3:3:0). Prerequisites SYST 661 and undergraduate or graduate course in communications engineering or permission of instructor. Hardware, software, and human elements of C-cubed systems. Systems structures and connectivity. Analysis and modeling. Typical large military, civil, and commercial systems.

761 Special Topics in Command Control and Communications Systems Engineering (3:3:0). Prerequisite 760 or permission of instructor. Individual topics selected by the student with professor's approval are studied and discussed. A formal midterm progress report, including bibliography, is submitted with a final report at the end of the semester.

798 Research Project (3:0:0). Prerequisite 9 hours of graduate level course work. Research project is chosen and completed under the guidance of a graduate faculty member, resulting in an acceptable technical report.

799 Master's Thesis (3-6:0:0). Prerequisites 9 hours of graduate level course work and permission of instructor. Research project is chosen and completed under the guidance of a graduate faculty member, which results in a technical report acceptable to a three-faculty-member committee, and an oral defense.

Information Technology

The general doctoral requirements of George Mason University apply to this program.

When the term Information Technology and Engineering is used at George Mason University to describe our school and its activities, it is intended to mean information technology and information engineering. These aspects of technology are emphasized in this geographic region and we will develop excellence in precisely these areas. Our focus is on the information and systems approaches to technology, which complement and enhance the more traditional approaches.

Information technology and engineering at GMU involves an external design function and an internal design function. Electrical and computer engineering and computer science involve the hardware and software aspects of the internal design function. The human element and the external design functions are also important for successful system design and operation. Our efforts in information systems and systems engineering primarily concern working with people to assist them in knowledge organization. These efforts involve systems, including information systems, and the entire life cycle of systems from initial conceptualization and specification of information and architectural requirements through system evaluation and redesign. They include the analysis capability that is needed to quantitatively determine operational characteristics of existing and future systems and processes. Our activities in operations research and applied statistics are focused on these important endeavors.

Our tasks in information technology and engineering vary from requirements definition and specification to conceptual and functional design and development of systems. They concern such topics as architectural definition and evaluation. These occur at considerably different points in the system life cycle and are needed for functional integration, maintainability, reliability, and the appropriate interfaces that ensure system design for human interaction. This human interaction with systems and processes, and the associated information processing activities, may take any of several diverse forms. It may involve human supervisory control of physical processes, such as the robots that are used in automated manufacturing. It may involve typically cognitive tasks at the operational
levels of fault diagnosis, detection and correction, or at the level of strategic planning.

A large number of new mathematical discoveries of the last three decades—especially in applied mathematics, statistics, and the mathematics of operations research—also have much to offer. The challenge is to exploit this knowledge by developing new computer simulation models that humans can use to increase their intelligence through an increase in the perspectives through which they approach a given problem.

Admission Requirements

Doctoral students in information technology 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 is required for admission to the program. Students without an appropriate master's degree who otherwise satisfy admission requirements will usually be encouraged to first seek such a degree in one of the five master's programs offered through this school. Application packets are available from the Office of Admissions and from the Office of the Dean of SITE.

An undergraduate grade average of B and Graduate Record Examination aggregate scores of 1200 on the aptitude tests are minimum requirements for applicants to the program. The admissions process includes submission of the application for admission, undergraduate and graduate transcripts from previous colleges and universities attended, GRE test results when available, three letters of reference, a resume and detailed statement of career goals and aspirations, and a self-assessment of past background. All of an applicant's background is examined prior to making an admissions decision.

Among appropriate fields of study that provide an immediate basis for doctoral study in information technology are engineering, computer science, operations research, statistics, mathematics, the physical sciences, economics, and psychology.

To ensure a common ground of fundamentals, students should have a background in topics such as calculus, differential equations, linear algebra, discrete structures, probability, and statistics. In addition, students entering the doctoral program in information technology 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. Since 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 for the program may be admitted and then required to take appropriate articulation courses.

Plan of Study

The Ph.D. program in information technology is made up of a core curriculum and in-depth study and research in the student's field of concentration, followed by preparation of a dissertation. Generally, a student will have obtained a master's degree in a field appropriate to information technology. This master's program often contains many of the doctoral core courses.

Under the guidance of the doctoral supervisory committee, the student prepares a plan of study. This lists the intended courses and their expected timing in both the breadth and advanced specialty parts of doctoral study. The plan should also contain the intended date of the comprehensive examinations and the tentative subject of the dissertation research.

An evaluation of previous efforts is given to students with an explanation of how these satisfy both the fundamental entrance requirements and the breadth requirements for the Ph.D. degree. Completion of the broad scope and in-depth advanced doctoral studies is followed by a comprehensive examination on the advanced work. In addition, preparation and oral presentation of a dissertation proposal is required. The doctoral program is completed with successful presentation and defense of a doctoral dissertation representing an important contribution to fundamental or applied knowledge in information technology.

Core Curriculum

Students must satisfy the breadth requirement in six subject areas. At least one area must be selected from each of the four departments within the School of Information Technology and Engineering. Each department offers up to five core or breadth subject areas.

Courses taken elsewhere in institutions of recognized standing may be used to satisfy portions of the breadth requirement when the course is equivalent to a GMU breadth course, the grade received in the course was an A or B, and the course was taken within five years of admission to GMU or the student has retained knowledge of the course material through professional experience.

The student grade-point average for courses taken at GMU to meet the breadth requirement must be at least 3.5. Students have the option of taking the final examination in a breadth course at GMU without taking the course itself, but may use this option only once for a given breadth course.

Doctoral Supervisory Committee

Upon admission to the program, a student is assigned a temporary adviser. The student is responsible for working with the temporary adviser or the supervisory committee may be appointed soon after the student's admission to the program. This is especially important for students who have completed a considerable amount of graduate work elsewhere.

The doctoral supervisory committee includes a faculty member from the student's intended major
Area, who is selected by the student to become chair of the doctoral supervisory committee. Other committee members are selected to form a committee of at least four people. At least two of the departments of the School of Information Technology and Engineering must be represented on this committee. Industrial representatives and faculty members from departments outside of the school are highly desirable but are not required on the committee. The doctoral supervisory committee administers the comprehensive examination, the dissertation proposal presentation, and the dissertation defense.

Advanced Specialty Area Requirement

Students must include in the plan of study a well-defined advanced specialty area. Successful completion of this requirement should enable the student to do basic or applied research in a significant contemporary area in information technology.

The doctoral plan of study generally includes at least 48 semester hours of graduate-level course work beyond the master's degree, and at least 16 of these must be information technology courses in the advanced specialty area of study.

Comprehensive Examination

The examination is based upon an area(s) of interest described by the student in a memo written to the examining committee to become a permanent part of the student's record. The memo describes an advanced specialty area(s) and briefly comments upon the courses that the student has taken in the area and upon the independent study taken under the direction of a particular faculty member. This memo also defines the coverage for the comprehensive examination. The objective of the comprehensive examination is to allow the examining committee to assess a student's readiness for and ability to complete doctoral research in an area of specialization.

After completing the advanced specialty part of the studies, the student requests appointment of a comprehensive examination committee and the comprehensive examination. This request is transmitted through the supervisory committee to the Office of the Dean. Generally conducted by the doctoral supervisory committee, the examination covers the student's area of specialization and includes both a written and an oral part. The result of the comprehensive examination is a grade of pass or fail with recommendations for removing any deficiencies.

After satisfactorily completing the written portions of the comprehensive examinations, the student arranges the oral portion. The entire advisory committee meets with the student and asks him or her questions concerning basic and advanced areas of study.

Dissertation Proposal Presentation

Near the end of the course work each doctoral student prepares a written dissertation proposal, which is presented in an oral public presentation to the doctoral supervisory committee. After completing this portion of the doctoral effort, the student is formally admitted as a "candidate" for the Ph.D. degree. The application for candidacy is on a standard form.

Dissertation and Final Defense

With concurrence of the advisory committee, the student proceeds with the doctoral research. When the central portions of the research have been completed to the point that the student is able to describe the original contributions of the dissertation effort, the final oral presentation of the dissertation research may be scheduled. A candidate submits the dissertation to the doctoral supervisory committee one month before the scheduled date of the dissertation defense. The dissertation is then presented to the committee in a public oral presentation.

Following a satisfactory evaluation of the oral defense of 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 information technology. This document must meet format guidelines specified by the Graduate School's Dissertation Guide.

If the candidate successfully defends the dissertation, the dissertation defense committee recommends completion of the final form of the dissertation, and that the faculty of the School of Information Technology and Engineering and the graduate faculty of George Mason University confer on the candidate the doctor of philosophy degree.

Residence Requirement and Research in Industrial Laboratories

The term residence indicates that the student is "at home" intellectually with the faculty community. The student is expected to "reside" at George Mason University and associate with the GMU faculty for at least two full academic years. The advisory committee determines the equivalent of two academic years of effort at GMU. The basis for residency, as here defined, is effort in the intellectual community at GMU to complete the basic or core study area requirements of the comprehensive examinations, completion of the advanced specialty areas of study and the associated advanced specialty portions of the comprehensive examinations, and preparation of a dissertation proposal that defines a definitive research contribution.

Student research in industrial and government laboratories is encouraged to the extent that these facilities support quality "independent" research by the doctoral student. The greater Washington area is home for the largest group of information technology professionals in the world, many of whom have made definitive contributions to research in this area. Area professionals with outstanding credentials and interests in information technology are solicited as Visiting Industrial Professors at GMU. They may serve on doctoral

http://catalog.gmu.edu
advisory committees and, where permitted by available time and interests, direct doctoral dissertations.

**Approved Core Curriculum Courses**

**Computer Science:**
- CS 521 Software Design and Development
- CS 540 Language Processors
- CS 571 Operating Systems
- CS 580 Introduction to Artificial Intelligence
- CS 583 Data Structures and Analysis of Algorithms

**Electrical and Computer Engineering:**
- ECE 500 Signals and Systems: Theory and Applications
- ECE 511 Microprocessors, Microcomputers and Applications
- ECE 521 Modern Systems and Control Theory
- ECE 528 Random Processes in Electrical and Computer Engineering
- ECE 542 Computer Network Architecture and Protocols

**Information Systems and Systems Engineering:**
- SYST 660 Elements of Systems Engineering
- SYST 661 Economic System Analysis
- INFS 712 Data Communications
- INFS 714 Database Management Systems

**Operations Research and Applied Statistics:**
- OR 541 Operations Research I
- OR 542 Operations Research II
- STAT 644 Applied Probability
- STAT 654 Applied Statistics

**Information Technology Courses (INFT)**

Graduate courses listed under the departments of Computer Science, Electrical and Computer Engineering, Information Systems and Systems Engineering, and Operations Research and Applied Statistics are appropriately considered as courses forming an inherent part of this program.

**796, 797 Directed Reading and Research (1-3).** Reading and research on a specific topic in information technology under the direction of a faculty member. May be repeated as needed.

**800, 801 Doctoral Seminar in Information Technology (1).** A weekly seminar in information technology with interactive participation by students, faculty, and invited specialists.

**803, 804 Doctoral Tutorial in Information Technology (3).** Individualized intensive study of particular aspects of information technology. May be repeated as needed.

**811 Machine Learning (3:3:0).** Prerequisite CS 580, CS 681, or permission of instructor. Introduction to machine learning. Topics cover past and current developments in machine learning.

**812 Advanced Topics in Natural Language Processing (3:3:0).** Prerequisite CS 680 or permission of instructor. Advanced treatment of topics in syntax, semantics and generation of linguistic output. Implementation and applications are also discussed.

**815 Parallel Computation (3:3:0).** Prerequisite At least one course numbered above 620 in CS or ECE, Introduction to parallel computation. Topics illustrate some of the contemporary thinking on the relationships between the architectural, algorithmic, and language requirements for parallel computers.

**821 Software Engineering Seminar (3:3:0).** Prerequisite CS 621 or permission of instructor. This seminar studies the application of software engineering principles, design methods, and support tools through real-life problems extracted from faculty/industry projects.

**830 (formerly ECE 634) Detection and Estimation Theory (3:3:0).** Prerequisite ECE 528. 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, Kalman and Wiener filters.

**832 Speech and Image Coding (3:3:0).** Prerequisite ECE 535, ECE 632. Study of waveform coding concepts and algorithms and their applications to the analysis and design of data compression systems. Specific schemes involving speech and image coding are discussed. Topics include statistical properties of speech and image signals, rate distortion theory, predictive and adaptive coding techniques, optimum quantization and bit assignment algorithms.

**833 (formerly ECE 639) Satellite Communication (3:3:0).** Prerequisite ECE 631 or permission of instructor. Introduction to the 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, optical satellite communications.

**835 Architectures for Knowledge-Based Vision Systems (3:3:0).** Prerequisite ECE 644 or equivalent. Introduction to knowledge-based vision systems. Topics include image analysis, vision system architectures (human visual system, homogeneous, heterogeneous, autonomous), vision system operations (focus and zooming), picture recognition languages, introduction to knowledge-based and expert systems, learning algorithmic schemes, applications. Course includes a design project.

**840 (formerly ECE 651) Advanced Robotics (3:3:0).** Prerequisite ECE 650 or permission of instructor. Review of state-of-the-art in theoretical and software aspects of robotics. Topics include compliance, flexible manipulators, intelligent task
planning, collision avoidance, grasping and pushing. Dexterous manipulation with multifingered hands, coordination of multiple manipulators, legged locomotion, autonomous navigation, robot languages, intelligent control, integration of sensory information, visual servoing, robot learning.

841 State Estimation and Stochastic Control (3:3:0). Prerequisite ECE 521 and 528 or permission of instructor. Detailed treatment of stochastic control theory and its applications. Topics include state space models with random inputs, optimum state estimation, Kalman filtering. Linear Quadratic Gaussian problem, minimum variance control, computational issues, and various applications.

843 Computer-Aided Control System Design (3:3:0). Prerequisite ECE 620 or ECE 624. Investigation of available computer-aided design (CAD) methods and current research in application of artificial intelligence to the computer-aided design of dynamic systems. Applications in computer-aided control system design. Topics include control system design using existing CAD methods, representation of design knowledge, integration of algorithmic and heuristic approaches to system design, intelligent user interfaces for computer-aided design, and intelligent design tutors.

844 Pattern Recognition (3:3:0). Prerequisite ECE 521 and ECE 528 or equivalent or permission of instructor. Study of mathematical methods in pattern recognition. Topics include perceptions, categorization, induction, entropy minimization, covariance diagonalization, statistical decision making, discrimination, feature selection, learning, fuzzy objective function clustering, string and high dimensional pattern grammars, stochastic languages, error-correcting automata, grammatical inference.

845 High Frequency Electronics (3:3:0). Prerequisite ECE 520 or permission of instructor. Study of devices and circuits used in high-speed communication systems. Topics include microwave bipolar transistors, GaAs MOSFETs, and high-speed integrated circuits; the design of linear and power amplifiers using S-parameter techniques and computer simulation.

846 Optical Signal Processing (3:3:0). Prerequisite ECE 565. Study of optical systems for processing temporal signals and images. Topics include use of coherent optical systems for image processing and pattern recognition, principles of holography, acousto-optic systems for radar signal processing, and optical computers.

878 Statistical Analysis of Signals (3:3:0). Prerequisites STAT 644 and 658 or equivalent. Advanced course in the analysis of discrete- and continuous-time signals using methods of stochastic differential equations and time series. Familiarity with the methods of harmonic analysis and times series modeling is presumed. 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, array processing and target tracking. Relevant computational architectures such as systolic arrays are also discussed.

880 Queuing Modeling of Computer-Communication Networks (3:3:0). Prerequisite Doctoral standing or permission of instructor. Study of 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. Local area networks, manufacturing systems, and other applications.

881 Numerical Methods for Mathematical Optimization (3:3:0). Prerequisites OR 641 or 642 or 643 or 644 and knowledge of a scientific programming language (preferably FORTRAN). Study of computational issues related to the solution of linear, integer, and nonlinear programming problems. Topics include the use of list processing, AI, parallel processing, efficient inversion techniques, and numerical analysis procedures. Complexity analysis and the structure of algorithms. Recent results relating to the worst case and average case performance of algorithms. Survey of the leading software. Students use, alter, and develop software throughout the course.

882 Advanced Topics in Combinatorial Optimization (3:3:0). Prerequisites OR 641, 642, and admission to Ph.D. Program or permission of instructor. Study of recent advances in the solution of large integer programming problems using the polyhedral structure of the problem. Topics include the facial structure of a variety of real-world problems, methodology for developing cutting planes based on this polyhedral structure, reformulation procedures, group theoretic results, solving equations in integers, and the use of subadditive duality. Topics stress the most recent developments in the field.

883 Advanced Topics in Nonlinear Programming (3:3:0). Prerequisites OR 644 and admission to SITE doctoral program or permission of instructor. Study of algorithms for solving nonlinear constrained and unconstrained problems. Study of current literature on methods for globally solving nonconvex problem and factorable programming techniques. Other possible topics are quasi-convexity, recent duality results, complementary pivot theory, quadratic and stochastic programming, max-min problems and some problems in optimal control.

910 Advanced Topics in Artificial Intelligence (3:3:0). Prerequisite CS 680, 681, or 682. Special topics in artificial intelligence not occurring in the regular computer science sequence. Seminar format requires substantial student participation. Subject matter may include continuation of existing 600- or 700-level courses in artificial intelligence and/or other topics such as machine learning, intelligent tutoring systems, and mechanical theorem-proving. Course may be repeated for credit when subject matter differs.
915 Advanced Topics in Parallel Computation (3:3:0). Prerequisite INFT 815. Seminar 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 a parallel environment, and parallel distributed processing (neural networks).

921 Advanced Software Engineering Seminar (3:3:0). Prerequisites INFT 721 and CS 580. Advanced software engineering topics currently in research laboratories, or which have received only empirical treatment. Topics may include special application areas (as opposed to nontraditional applications), such as artificial intelligence, as well as important industry-related software issues which have far-reaching consequences, like software configuration management.

930 Multichannel Statistical Signal Processing (3:3:0). Prerequisite INFT 830. Study of topics in multichannel estimation and detection theory, with emphasis on the multivariate gaussian noise model. Multivariate distribution theory, including the Wishart, matric-t, and multivariate-beta distributions, considering radar and sonar signal processing applications. The general linear model and its application in adaptive and signal processing. Other topics include spectral analysis via principal components, tests for the dependence of several stochastic inputs, and analysis of covariance structures.

931 (formerly ECE 638) Secure Telecommunication Systems (3:3:0). Prerequisites ECE 632 and 633. Introduction to secure data and voice communications. Topics include theoretic basis of cryptography, random cipher systems, practical security schemes, linear and nonlinear shift registers and encryption algorithms, block encipher and NBS data encryption standard (DES), public key cryptography, RSA, knapsack algorithms, digital signatures and authentication, security of computer networks, cryptographic protocols, key management, speech security, voice scrambling.

932 (formerly ECE 637) Spread Spectrum Communications (3:3:0). Prerequisite ECE 631. Fundamentals of spread spectrum communications. Major topics include pseudonoise spread spectrum systems, acquisition, synchronization, time-hopping, frequency hopping, and multiple-access communication.

933 Modeling and Analysis of Integrated Services Digital Networks (3:3:0). Prerequisites ECE 631 and 642. Study of integrated services digital networks. Topics include queuing, modeling, and analysis of digital circuit-switching systems; integrated data and voice multiple access schemes; ISDN layered architectures; ISDN protocols; transmission technologies and system implementations.

935 Knowledge-Based Systems for Text Translation (3:3:0). Prerequisite INFT 835 or equivalent. Current topics for text processing, analysis and translation. Topics include automatic text reading and reconstruction systems; computational linguistics: syntax analysis; semantic analysis and interpretation; discourse analysis and information structuring; text generation; text abstractions; strategies in machine translation and R & D; sublanguages for automatic translation, knowledge-based machine translation; basic theory and methodologies in EUROTRA and GMTP projects; machine translation as an expert task; human-machine interaction in translation; reflections on knowledge needed to process formed languages.

936 Advanced Computer Architecture Seminar (3:3:0). Prerequisite ECE 641 or equivalent. Current topics of advanced research in computer architecture. Topics include data flow architecture; high-level language (HLL) architectures; multiprocessors: structure, algorithms, operating systems, RISC vs. CISC Architecture, distributed systems. Discussion of commercial advanced architecture systems.

940 Advanced Topics in Control Robotics (3:3:0). Prerequisite Permission of Instructor. Advanced and newly developed topics in control and robotics. Content varies depending on current faculty interests and student demand. Topics such as knowledge-based control, intelligent control, hierarchical and distributed control, robust control, and reasoning under uncertainty.

941 System Identification and Adaptive Control (3:3:0). Prerequisites ECE 528, ECE 624. Advanced treatment of identification and adaptive control. Topics include identification algorithms, their convergence and accuracy, computational aspects. Model reference and self-tuning adaptive control, transients, stability and robustness. Intelligent schemes to improve robustness. Students are also required to study the literature individually and to complete a computer project.

943 Models of Approximate Reasoning (3:3:0). Prerequisite CS 580, STAT 644, or permission of Instructor. Survey of mathematical tools and algorithms for the modeling and utilization of uncertain knowledge in approximate reasoning. Topics include Bayesian theory, fuzzy logic, the Dempster-Shafer theory, evidential reasoning, probabilistic logic, multiattribute utility theory, confirmation theory, theory of endorsements, nonmonotonic reasoning, default reasoning, measures of information, knowledge fusion, propagation of beliefs in networks, and applications to knowledge support systems.

945 Advanced Topics in Microelectronics (3:3:0). Prerequisites ECE 671, ECE 684, and INFT 845. Current topics of advanced research in microelectronics. Topics include Very High Speed Integrated Circuits (VHSCs), Monolithic Microwave Integrated Circuits (MMICs), Optoelectronic Integrated Circuits (OICs), novel device structures and advances in semiconductor device technology.

http://catalog.gmu.edu
Areas of Study

950 Design and Management Aspects of Information Systems (3:3:0). Prerequisite Admission to Ph.D. program in INFT, SYST 661, CS 521, MGMT 610, and ECON 602 or permission of instructor. Impact of organizations and management of information systems (IS) and vice versa. 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; economic analysis.

951 Software Productivity (3:3:0). Prerequisite CS 580, SYS 660 or permission of instructor. Analysis of technologies and methodologies of the systems approach to software engineering theory and application, decision support and knowledge-based systems for enhancing software productivity. Macro-enhancement approaches to increasing the effectiveness and efficiency of software development with particular emphasis on requirements specifications.

952 Knowledge-Based Systems Applications (3:3:0). Prerequisite SYS 660, CS 580, or permission of instructor. Analysis of the framework of applications of knowledge-based systems within information technology. Study of impact of KSS on systems such as computer integrated manufacturing, planning support systems, and distributed information systems. Comparison of procedural and non-procedural computer languages in support of decision processes in large scale systems.

958 Basic & Applied Decision Support Systems Technology (3:3:0). Prerequisite Systems Engineering 660 or 661. Analysis of tools, techniques, and methods that contribute to the design, development, application, and evaluation of interactive computer-based decision support systems. Analysis of the state-of-the-art and state-of-the-expectation of basic and applied decision support systems technologies like requirements definition, software engineering, analytical methods assessment, and structured evaluation.

960 Expert Database Systems (3:3:0). Prerequisite CS 580, INFS 714, or permission of instructor. Study of the concepts, tools, techniques, and architectures of expert database systems, which support the specification, design, prototyping, production and maintenance of applications requiring knowledge-directed processing of shared information stored in large databases.

979 Topics in Statistical Aspects of Information Technology (3:3:0). Prerequisite STAT 652 or equivalent. Study of statistical science—the body of methods and techniques which convert raw data into information. Contents vary. Such topics as high interaction statistical graphics, stochastic methods for parallel computing, cryptography and covert communications, order-restricted inference, treatments of imprecision, and the foundations of inference are covered. Course may be repeated when topics are distinctly different.

998 Doctoral Dissertation Proposal (1-12:0:0). Prerequisite Admission to doctoral candidacy. Work on a research proposal which forms the basis for a doctoral dissertation. May be repeated. No more than 24 credit hours of INFT 998 and 999 may be applied to doctoral degree requirements.

999 Doctoral Dissertation (1-12). Formal record of commitment to doctoral dissertation research under the direction of a faculty member in information technology. May be repeated as needed.

http://catalog.gmu.edu
Interdisciplinary Studies

Faculty
Froman, Wayne J. (Philosophy and Religious Studies). Coordinator, Liberal Studies
Levy, Jack (Educational Leadership and Human Development). Coordinator, Human Resources Program
Kelley, Michael R. (Telecommunications). Coordinator, Telecommunications Program
Sanford, James F. Assistant Dean for Individualized Study Programs

Interdisciplinary Studies, M.A.I.S.
The Master of Arts in Interdisciplinary Studies (M.A.I.S.) is designed for students who seek master's degrees that integrate knowledge from several disciplines. The M.A.I.S. is nontraditional in that students design, with the help of faculty advisers, individualized programs of study that include courses from several academic departments. Therefore, students' programs are individualized, interdisciplinary, and unique.

The M.A.I.S. degree program is divided into two tracks: individualized studies and liberal studies.

Individualized Studies
The individualized studies (IS) track is designed for students who have specific professional or career interests in interdisciplinary areas not served by traditional graduate programs. Students in this track combine courses from various disciplines appropriate to their particular career needs. Since the IS track is for professionally oriented students, applicants should demonstrate their career interests by prior work or educational experience in their proposed areas of concentration. Under the guidance of faculty advisers, students entering the program develop an area of concentration tailored to their particular interests. A major part of the IS track is the completion of a project that integrates knowledge gained within each student's area of concentration. Students in the IS track may earn a maximum of six hours' credit for prior experiential learning related to their field of concentration.

Admission Requirements. Applicants to the IS track must first obtain counseling through the IS office. Application is completed after a student has applied to the Graduate School, submitted all undergraduate and graduate transcripts, submitted three letters of reference, and completed the application to the IS program.

Degree Requirements. The IS track requires that students complete 36 hours of course work. Up to 12 hours of transfer credit may be accepted, provided that each course has a minimum grade of B and that the course work relates to the proposed area of concentration. In all cases, a minimum of 18 hours of course work at George Mason University must be completed with a minimum grade of B (excluding credit for experiential learning and IS project or thesis credits). No more than 12 hours of course work within a single discipline taken at George Mason University may be offered toward the 36-hour requirement in the IS track. The extent to which transfer credit and credit earned at George Mason University in the same discipline may be offered toward the degree is determined on an individual basis.

The proposed course of study must be designed in collaboration with and approved by a full-time member of the George Mason University faculty. A three-credit IS project is required or, with the approval of the faculty adviser and the chair of the adviser's department, a six-credit IS thesis may be substituted.

Within the IS track students may, if they wish, apply to one of two special concentrations, human resources and telecommunications. Students applying to the human resources program must complete GREs or GMATs in addition to the admissions requirements described above.

Human Resources Program. This program is designed for prospective human resource professionals, experienced individuals who wish to change careers, and those currently employed in human resources fields who wish to obtain a master's degree and acquire new skills and knowledge. The curriculum integrates courses from business, communication, conflict management, education, psychology, public administration, and sociology into an 18-hour core curriculum and a 15-hour specialization. Students must also complete a three-hour project.

For more information, contact Jack Levy or Ward Cates, Department of Educational Leadership and Human Development (764-6103), or James F. Sanford, Assistant Dean for Individualized Study Programs (323-2342).

Telecommunications Program. This program is designed for telecommunications professionals, individuals who want to change careers into the telecommunications area, and others who want to broaden their knowledge and earn a master's degree in telecommunications. The curriculum integrates courses from business, communication, computer science, economics, engineering, English, information systems, and law into a 12-hour core curriculum and a 15-hour specialization in one of four telecommunications areas. Students must also complete an internship, directed readings/research and a coordinating seminar.
For more information, contact Michael R. Kelley, Department of Telecommunications (323-3585), or James F. Sanford, Assistant Dean for Individualized Study Programs.

Liberal Studies

The liberal studies (LS) track offers a broad course of study for those who wish to explore the fundamental ideas of Western culture within the context of contemporary society. In addition to appealing to students who wish to broaden the humanistic dimension of their knowledge, this track is also valuable to business and professional people who feel the need for liberal studies to cope with the complex issues posed by modern society. Teachers, librarians, and other professionals often find that this program offers an alternative to graduate work in a single discipline. For the student with comprehensive goals, the program may be more satisfying than participating in a series of unrelated courses. A student in the LS track chooses one broad area of concentration from four interdisciplinary topics: (1) technology and culture; (2) the secular and the sacred; (3) the arts and society; and (4) personal, social, and political values. Within the student's area of concentration, he or she pursues individually designed courses of study.

Admission Requirements. In addition to fulfilling the admission requirements of the Graduate School, an applicant to the LS track is expected to provide three letters of recommendation and a written statement of 750 to 1,000 words detailing the reasons for choosing this degree program rather than a more traditional one. Care should be given to the preparation of the statement. The applicant should cover the following issues in the statement: (1) In terms of your goals and objectives, why is the LS track of the M.A.I.S. program more appropriate than a traditional master's program; (b) in view of the four concentrations listed above, what interests you wish to pursue within this degree; (c) How you see this degree relating to your previous education and life experience.

Degree Requirements. The program is designed to provide students with a common framework for examining and understanding the origins, historical development, and contemporary impact of ideas and values characteristic of Western culture and to provide an opportunity for individually designed courses of study leading to in-depth analysis of particular issues or problems of Western culture in contemporary society. The key factors in this design are core seminars, an interdisciplinary concentration in an approved topical area, supporting course work, and a master's thesis. Credit hours required for graduation total 36, including 6 hours in core seminars and at least 30 hours in course work at the 500-level or above, including the master's thesis. A student must complete all requirements for the degree within six years of matriculation.

Core Seminars. Seminar I. An entering student is required to take an introductory three-hour graduate seminar during the first nine hours of the program. This seminar introduces the student to the study of human culture, as well as to the unique features of Western culture—its origins and continuing historical development.

Seminar II. This seminar is designed to be the last course that the student takes before commencing work on a thesis. Through the vehicle of a problem or theme chosen by the professor, the student again turns to the question of culture. In this case, however, the student applies the knowledge gained from the introductory seminar, as well as from courses completed, particularly those in the area of concentration.

Interdisciplinary Concentration. With the assistance of an adviser, a student chooses an interdisciplinary project and area of study from among the following general topics:

1. Technology and culture
2. The secular and the sacred
3. The arts and society
4. Personal, social, and political values

Since each of these topics can be studied successfully from the perspective of several of the traditional academic disciplines (humanities, social sciences, etc.), students are expected to choose courses from supporting departments to complete their fields of study.

Course Work and Master's Thesis. Courses relating to the student's area of study may be selected, with approval of the student's adviser, from among the graduate offerings of the departments in the College of Arts and Sciences. Courses from other areas may also be selected if they contribute to an understanding of the student's project. At least six of the courses presented for the degree must be in the student's area of concentration.

The thesis is planned as the last major activity in the student's course of study in the chosen area of concentration. The thesis is an interdisciplinary study of a significant problem identified by the student, and approved by the adviser, arising out of the student's course work and research within the chosen area of concentration.

Course Work

Liberal Studies 510: The Phenomenon of Culture (3:3:0). Prerequisites: Graduate standing and/or permission of the instructor. Examination of various concepts of culture (e.g., anthropological, sociological, philosophical), with a view toward arriving at a concept of culture that allows us to account for the difference between cultures as well as the diversity that occurs within a culture. Using this understanding, we explore the unique features of Western culture, paying particular attention to a single idea, e.g., the idea of evolution, and the ways in which it reflects and has influenced the values and ideals of the West.
798 Individualized Studies Project (3:3:0).
Prerequisites Degree candidacy in Individualized Studies Track M.A.I.S., completion of 27 semester hours of graduate course work, approval of faculty adviser, and approval of Assistant Dean for Individualized Study Programs. Research project related to the student's individualized concentration taken under supervision of the faculty adviser.

799 Individualized Studies Thesis (6:0:0).
Prerequisites Degree candidacy in the Individualized Studies Track M.A.I.S., and acceptance by the Graduate School of a thesis proposal. An original research endeavor related to the student's M.A.I.S. program concentration. Research must result in a document meeting the Graduate School's standards listed in the Guide for Preparing Graduate Theses, Dissertations, and Projects.

Mathematics

Faculty
Alligood, Kathleen T., Ph.D., University of Maryland, 1979; Assistant Professor
Colonna, Flavia, Ph.D., University of Maryland, 1985; Assistant Professor
Fischer, Klaus G., Ph.D., Northwestern University, 1973; Associate Professor
Gabel, Michael R., Ph.D., Brandeis University, 1972; Associate Professor
Kiley, W. Thomas, Ph.D., Brown University, 1969; Associate Professor
Lawrence, James F., Ph.D., University of Washington, 1975; Associate Professor
Levy, Ronald F., Ph.D., Washington University, 1974; Professor
Lim, Teck-Cheong, Ph.D., Dalhousie University, 1974; Associate Professor
Lin, Jeng-Eng, Ph.D., Brown University, 1976; Associate Professor
McDaniel, Andrew L., Ph.D., Brandeis University, 1985; Assistant Professor
Saperstone, Stephen H., Ph.D., University of Maryland, 1970; Professor, Department Chair
Shapiro, Jay A., Ph.D., Rutgers University, 1975; Associate Professor
Singman, David H., Ph.D., McGill University, 1980, Assistant Professor
Smith, John A., Ph.D., University of Maryland, 1970; Professor
Thomas, Romeo F., Ph.D., University of Warwick, 1979; Assistant Professor
Trenholme, Alice R., Ph.D., University of Maryland, 1982; Assistant Professor

Mathematics, M.S.
The Department of Mathematical Sciences offers courses in pure and applied mathematics leading to the M.S. in mathematics. The program trains students in areas relevant to the needs of business, industry, government, and the teaching profession and provides the necessary background for advanced graduate work. Two specializations within the program allow the students, if they wish, to concentrate their studies in either operations research or statistics. Limited financial aid is
Admission Requirements

In addition to fulfilling the Graduate School admission requirements, applicants must have the following:

1. Three letters of recommendation.
2. Extensive undergraduate training in mathematics that includes courses similar to MATH 315, 316: Advanced Calculus; MATH 322: Linear Algebra. MATH 611 and 612: Intermediate Analysis and Algebra present some of the highlights of these prerequisite courses and sharpen the skills necessary to enable a student to enter the degree program.
3. GRE exams are recommended but not required.

Degree Requirements

In addition to fulfilling the Graduate School degree requirements, the candidate must:

1. Complete at least 30 semester hours of graduate work. With the approval of the department some of these hours may be from courses in related disciplines.
2. Complete Algebra I (MATH 621) and Linear Analysis I (MATH 675).
3. Complete a research component of the degree: Thes 799/Seminar 795/796. This component must be at least three hours and may not exceed nine hours. No more than six hours of either thesis or seminar may be applied toward the 30-hour minimum requirement for the degree.
4. Pass the departmental examination. This oral exam is to be taken near the completion of the degree and tests the cumulative skills acquired by the student. The exam consists of a basic and advanced unit in each of the areas of pure mathematics, operations research, and statistics. A student must pass two units, one basic and one advanced. The two units are chosen by the student in consultation with the graduate coordinator.

Course Work

The department offers courses in pure and applied mathematics, including Real and Complex Analysis, Algebra, Topology, Geometry, and Differential Equations. These include all courses prefixed by MATH. A complete list appears below. Courses prefixed by OR and STAT are offered by and listed with the Department of Information Systems and Systems Engineering.

Options in Operations Research and Statistics

Students may specialize in operations research or statistics instead of the standard mathematics curriculum.

Operations Research

This specialization allows students to concentrate their studies on mathematical models and methods that are used to analyze complex real-world decision problems in both the private and public sectors.

The following requirements apply to this specialization:

1. In addition to satisfying the general degree requirements of the department, students must complete a minimum of four courses prefixed by OR. Three of these must be at the 600 level or higher. Students must complete OR 541 and 542: Operations Research I and II.
2. The departmental examination must consist of the basic unit in operations research and the advanced unit in any area.

Statistics

This specialization allows students to concentrate their studies in the theory and practice of the methods and techniques of statistical analysis. The following requirements apply to this specialization:

1. In addition to satisfying the general degree requirements of the department, the student must complete MATH 651: Probability, and STAT 752: Mathematical Statistics.
2. The student must complete three of the following courses:
   - STAT 653 Survey Sampling
   - STAT 654 Applied Statistics
   - STAT 655 Analysis of Variance
   - STAT 656 Regression Analysis
   - STAT 657 Nonparametric Statistics
   - STAT 659 Topics in Statistics
3. The department examination must consist of the basic unit in the area of statistics and an advanced unit in any area.

Mathematical Sciences Courses (MATH)

A double number separated by a comma (MATH 771, 772) indicates that both graduate courses normally constitute a sequence and that the first semester is prerequisite to the second. The prerequisite may be waived by permission of chair. See also STAT and OR courses.

601 Principles of Analysis I (2:2:0).
Prerequisites The calculus sequence and permission of instructor. A fast-paced development of calculus including differentiation, integration, numerical methods, Fourier series, vector analysis, multivariate calculus. Prior exposure to some of the topics is assumed. Although open to all graduate students, the course is intended for those entering the graduate programs in the School of Information Technology and Engineering. Credit is not applicable toward the M.S. in mathematics.

602 Principles of Analysis II (2:2:0).
Prerequisites The undergraduate calculus sequence and permission of instructor. A fast-paced development of topics from advanced calculus including ordinary differential equations, complex analysis, Laplace and Fourier transforms. Prior exposure to some of these topics is assumed.

http://catalog.gmu.edu
The course is intended for students entering the graduate programs in the School of Information Technology and Engineering. Credit is not applicable toward the M.S. degree in mathematics.

603 Principles of Linear Algebra (1:1:0). Prerequisite: A course in linear algebra and permission of instructor. A fast-paced development of linear algebra including linear equations, matrices, vector spaces, linear transformations, inner products, and norms. Prior exposure to some of the topics is assumed. The course is intended for those entering the graduate programs in the School of Information Technology and Engineering. Credit is not applicable toward the M.S. in mathematics.

604 Principles of Discrete Mathematics (1:1:0). Prerequisite: Permission of instructor. A fast-paced development of discrete mathematics including combinatorics, difference equations, graphs, trees, and digital systems. Prior exposure to some of these topics is assumed. The course is intended for students entering the graduate programs in the School of Information Technology and Engineering. Credit is not applicable toward the M.S. degree in mathematics.

611 Intermediate Analysis (3:3:0). Development of the number system; review of the highlights of calculus, sequences, and series of functions. Credit not applicable toward the 30 credits required for the M.S. in mathematics, but can be counted toward the master of education.

612 Intermediate Algebra (3:3:0). Linear algebra, vector spaces, linear independence, linear transformations, and matrix operations. Credit not applicable toward the 30 credits required for the M.S. in mathematics but can be counted toward the master of education.

620 Applied Matrix Analysis (3:3:0). Prerequisite: MATH 612, 303 or 322. Review of vector and matrix arithmetic. Gaussian elimination, linear programming, eigenvalues, the Jordan form, linear differential systems, positive definite matrices, Markov processes, game theory, applications to numerical analysis, optimization, economic and ecological systems. Emphasis on modeling using matrix algebra to give full view to its applicability.

621 Algebra I (3:3:0). Groups, linear algebra, matrix groups.

623 Algebraic Coding Theory (3:3:0). Prerequisite: MATH 303 or permission of instructor. Introduction to the mathematical theory of error-correcting codes including linear block codes such as Hamming, Golay, BCH, and Reed-Muller. Also included are the MacWilliams equations and t-designs.

625 Numerical Linear Algebra (3:3:0). Prerequisites: A course in linear algebra and some programming ability. Computational procedures for linear systems, least-square problems, and eigenvalue problems, with an emphasis on error analysis.

629 Topics in Algebra (3:3:0). Prerequisite: Permission of instructor. Special topics in pure or applied algebra not covered in the regular algebra sequence. May be repeated for credit.


637 638 Non-Euclidean Geometry I, II (3:3:0). Prerequisite: Permission of instructor. Affine, projective, hyperbolic, elliptical, differential geometry; transformations and elementary combinatorics.

639 Topics in Topology and Geometry (3:3:0). Prerequisite: Permission of instructor. Special topics in topology and geometry not covered in the regular topology and geometry sequence. May be repeated for credit.

641 Combinatorics and Graph Theory (3:3:0). Prerequisite: Permission of instructor. Study of fundamental concepts in combinatorics and graph theory. Various methods of enumerative combinatorics, including the principle of inclusion-exclusion, the multinomial theorem, generating functions, recurrence relations, graphs and subgraphs, trees, connectivity, planar graphs, coloring, and matching.

644 Combinatorics and Convexity (3:3:0). Prerequisite: Permission of instructor. Separation theory of convex sets, polarity, duality theorems of convex optimization, valuation theory, combinatorial aspects of convexity, and applications to linear and integer programming.

651 Probability Theory (3:3:0). Axioms for a probability space, conditional probability, random variables, distribution functions, moments, characteristic functions, modes of convergence, limit theorems.


671 Fourier Analysis (3:3:0). The study of fundamental ideas in Fourier Analysis. Topics include orthonormal systems, Fourier series, continuous and discrete Fourier transform theory, generalized functions, and an introduction to spectral analysis. Applications to the physical sciences, linear systems theory, and signal processing are used to motivate and integrate these topics.


676 Linear Analysis II (3:3:0). Prerequisite: MATH 675 or permission of instructor. Analysis of bounded and unbounded operators, spectral theorems, differential operators, applications. A brief account of Lebesgue integration theory may be included.
Areas of Study


678 Partial Differential Equations (3:3:0). Prerequisites MATH 303 and 304. Physical examples, characteristics, boundary-value problems, integral transforms, and other topics, such as variational, perturbation, and asymptotic methods.

679 Topics in Analysis (3:3:0). Prerequisite Permission of instructor. Special topics in analysis not covered in the regular analysis sequence. May be repeated for credit.

681, 682 Systems Optimization and Control I, II (3:3:0), (3:3:0). Prerequisites MATH 651 or equivalent and MATH 675 or permission of instructor. Systems of linear differential equations, optimization of linear dynamical systems, controllability and optimal control of linear systems, Gauss-Markov Processes, Kalman filtering, Applications to networks, aerospace, information processing.

685 Numerical Analysis (3:3:0). Prerequisite Linear algebra, advanced calculus or its equivalent and some programming ability. A study of computational methods with an emphasis on error analysis in linear algebra, approximation theory, nonlinear equations, and numerical differentiation and integration.


689 Topics in Applied Mathematics (3:3:0). Prerequisite Permission of instructor. Special topics in applied math not covered in the regular applied math sequence. May be repeated for credit.

697 Independent Reading and Research (1-3:0:0). Prerequisite Graduate standing and permission of instructor. In areas of importance, but insufficient demand to justify a regular course, an individual student may undertake a course of study under the supervision of a consenting faculty member. A written statement of the content of the course and a tentative reading list will normally be submitted by the student as part of the request for approval to take the course. A literature review, project report, or other written product is normally required. May be repeated for a maximum of nine credits.

722 Algebra II (3:3:0). Prerequisite MATH 621 or permission of instructor. Rings, fields, Galois theory.

752 Mathematical Statistics (3:3:0). Prerequisite MATH 651. Sampling distributions, point and interval estimation (Cramer-Rao theorem), testing of hypotheses (Neyman-Pearson tests, uniformly most powerful tests, sequential tests), linear models, distribution free methods.

795, 796 Seminar (3:3:0), (3:3:0).

799 Thesis (1-6:0:0). Original or compulsory work to be evaluated by a committee of three faculty members.

800 Studies for the Doctor of Arts in Education (varied credit). Prerequisite D.A.Ed., admission to study in mathematics. Program of studies designed by student's discipline director and approved by student's doctoral committee, which brings the student to participate in the current research of the discipline director and results in a paper reporting the original contributions of the student. The paper is presented in a subsequent D.A.Ed. summer seminar. Enrollments may be repeated.
Music

Faculty

Brawley, Thomas M., Ph.D., Northwestern University, 1975: Associate Professor
Burton, Stephen D., M.M., Peabody Conservatory of Music, 1974: Professor
di Bonaventura, Sam, D.M.A., Peabody Conservatory of Music, 1964: Professor
Gabriel,Arnald D., M.S., Ithaca College, 1953: Professor
Harrison, Judith L., Ed.D., University of North Carolina at Greensboro, 1980: Assistant Professor
Hill, Thomas H., D.M.A., The Catholic University of America, 1970: Associate Professor
Kanyan, Joseph M., D.M.A., The Catholic University of America, 1972: Associate Professor
Maiello, Anthony J., M.S., Ithaca College, 1967: Professor
Smith, Glenn E., D.Mus., Indiana University, 1973: Associate Professor
Smith, James G., D.M.A., University of Illinois, 1973: Professor

Music, M.A.

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 impact of the arts on public life will continue to expand well into the twenty-first century. Each year, despite the sagging economic situation, opportunities increase for creative work by performers, composers, sculptors, painters, dancers, actors, historians, theorists, and musicologists.

The Master of Arts with Specialization in Music has been developed by the Department of Performing Arts as an educational channel to meet the intellectual and career needs of qualified students. It is a comprehensive and advanced program of study with a choice of concentrations in performance, music education, composition, conducting, and accompanying.

Admission Requirements

In addition to fulfilling the admission requirements of the Graduate School, the applicant is expected to hold a baccalaureate degree in music. Before admission to degree status, students must submit two letters of recommendation.

The following concentration admission requirements must also be met:

Performance: Audition
Music Education: Certification to teach music in the public schools
Composition: Submission of a portfolio of compositions and an interview with a faculty committee
Conducting: Audition
Accompanying: Audition

Degree Requirements

A student must successfully complete 30 hours of credit in graduate music courses. With the approval of the department, three hours of nonmusic graduate credit may be taken.

The student must satisfy the following requirements:

General Requirements (11 credits):
- Introduction to Research in Music (3)
- Analytical Techniques (3)
- History and Literature of Music (3)
- Ensemble (2)

Additional requirements for the concentration in Performance (19 credits):
- Graduate Private Music Instruction—Instrumental/Vocal (9)
- History and Literature of Music (3)
- Graduate Recital (1)
- Electives (6)

Additional requirements for the concentration in Music Education (19 credits):
- Psychology of Music Teaching and Learning (3)
- Aesthetics of Music Education (3)
- Thesis (6) or Orff Schulwerk certification (9)
- Electives (4-7)

Before receiving the degree, students in this concentration must complete the equivalent of one year of full-time public/private school music teaching. Before beginning the thesis or upon completion of Orff Schulwerk certification, students must pass a comprehensive examination in music education.

Additional requirements for the concentration in Composition (19 credits):
- Graduate Private Music Instruction—Composition (9)
- Theory (3)
- History and Literature of Music (3)
- Graduate Recital (1)
- Electives (3)

Additional requirements for the concentration in Conducting (19 credits):
- Graduate Private Music Instruction—Conducting (6)
- Advanced Topics in Conducting (3)
- Orchestration (3)
- Graduate Recital (1)
- Electives (6)

The number of students accepted as graduate conducting majors is limited by the extent to which it is possible to provide them with practical experience in conducting. In most cases, each student accepted is offered an opportunity to gain
conducting experience by serving as assistant conductor of a GMU ensemble.

Additional requirements for the concentration in
Accompanying (19 credits):
Graduate Private Music Instruction—Accompanying (9)
History and Literature of Music (3)
Chamber Ensembles (1)
Graduate Recital (Vocal Accompanying) (1)
Graduate Recital (Instrumental Accompanying or Chamber Music) (1)
Electives (4)

The entering graduate student in this concentration must show evidence of having completed one semester of study (or its equivalent) in each of the following foreign languages: French, German, Italian. Deficiencies in this area can be remedied by completing one semester of undergraduate study for each of the languages not previously studied. The recommended music history and literature courses are in the vocal, operatic, or chamber music areas.

Holbert L. Harris Theatre
The Holbert L. Harris Theatre, in Robinson Hall, is George Mason's Main Campus performance facility for dance, music, and theatre. This 533-seat modified proscenium theatre houses dance events, music concerts, recitals, theatre productions, and major conference events.

Music Courses (MUSI)

511 Analytical Techniques (3:3:0). Prerequisite Baccalaureate degree in music or permission of instructor. A detailed formal and stylistic examination of music selected from the major style periods. Development of the analytical skills necessary for theoretical study at the graduate level.

512 Advanced Orchestration (3:3:0). Prerequisite Baccalaureate degree in music with a minimum of three hours of study in orchestration or permission of instructor. Intensive study through analysis and arranging of advanced methods of instrumentation. Scoring for large forces. Twentieth-century vocal and instrumental techniques such as multophonic. Unusual instruments. New methods of notation. Late twentieth-century performance practices.

513 Advanced Topics in Music Theory (3:3:0). Prerequisite Baccalaureate degree in music or permission of instructor. Intensive study and analysis of music from the theoretical point of view, comparing trends in compositional techniques through various works. May be repeated for credit as topics change.

531 Advanced Topics in Music History and Literature (3:3:0). Prerequisite Baccalaureate degree in music or permission of instructor. Thorough examination of a specific musical style, genre, composer, compositional school, or historical development. Primary and secondary source materials are studied in historical and/or analytical contexts. May be repeated for credit as topics change.

541 Chamber Music Literature (3:3:0). Prerequisite Baccalaureate degree in music or permission of instructor. Historical and analytical study of the extensive literature for chamber ensembles (trios through nonets) in various instrumental combinations, from the seventeenth through the twentieth centuries.

543 Concerto Literature (3:3:0). Prerequisite Baccalaureate degree in music or permission of instructor. Historical and analytical study of the concepts which produced the concerto form and its extensive literature, from the seventeenth through the twentieth centuries.

561 Advanced Topics in Music Education (1-3:1-3:0). Prerequisite Degree in music education or permission of instructor. Intensive examination of specific areas of concern to music educators engaged in teaching vocal, instrumental, and general music at all levels or functioning as private studio teachers. Individual research, group discussions, and participation in related activities. Field experience may be required.

562 The Psychology of Music Teaching and Learning (3:3:0). Prerequisite Baccalaureate degree in music or permission of instructor. 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.

581 Graduate Choral Ensembles (1:0:3). Prerequisite Audition. Performance of works from the choral repertoire. Public concerts are given. May be taken for credit four times.

583 Symphonic Winds (1:0:3). Prerequisite Audition. Performance of works from the band repertoire. Public concerts are given. May be taken for credit four times.

585 Chamber Ensembles (1:0:3). Prerequisite Audition. Performance of works from the chamber music repertoire. Public performances are given. May be taken for credit four times.

587 Symphony Orchestra (1:0:3). Prerequisite Audition. Performance of works from the symphony orchestra repertoire. Public concerts are given. May be taken for credit four times.

597 Advanced Topics in Conducting (3:3:0). Prerequisite Baccalaureate degree in music with a minimum of two semesters' study in conducting, or permission of instructor. Intensive study of an advanced topic in conducting chosen according to interests of students and instructor from such topics as the following: (1) Choral Music Performance Techniques and Score Preparation; (2) Wind Ensemble Performance Techniques and Score Preparation; (3) Orchestral Performance Techniques and Score Preparation; (4) Performance Practices in Choral Music before 1750; (5) Rhythmic Analysis as a Guide to Score Interpretation in Music of All Periods. Maximum of six credits may be earned.

662 Introduction to Research in Music Education (3:3:0). Prerequisite Baccalaureate degree in music with certification to teach music or permission of instructor. Development of skills,
attitudes and understanding necessary in doing and reporting research in the teaching of music, including philosophical bases, scope and organization, stylistic practices in writing the research report, the study of materials and resources in music, education, music education, and the proper use of library and other research services.

663 Aesthetics of Music Education (3:3:0). Prerequisite Baccalaureate degree with certification to teach music or permission of instructor. Study of the philosophical foundations of contemporary music education, as well as a critical examination of music programs and activities in aesthetic education, and efforts by the music education establishment to enhance them.

671, etc. Graduate Private Music Instruction. See descriptions at end of music section.

684 Graduate Lecture-Recital (1-3:0:0). Corequisite Graduate Private Music Instruction at the three-credit level. A combination of musical performance and scholarly presentation on a well-defined topic. A public presentation is required. Preparation of the program is directed by a member of the full-time music faculty in consultation with the student's private music instructor. May be taken for a maximum of six credits.

688 Advanced Musical Theatre Techniques (1-3:1:2-6). Prerequisite Audition and permission of instructor. Preparation and presentation of works or parts of works from the musical theatre repertoire (opera, operetta, musical comedy). One hour of lecture per week and (for each credit pursued) two hours of practicum per week. Students will investigate applicable techniques through topically organized lectures and assignments, and in goal-oriented practicum sessions and rehearsals. Public performance(s) will be given.

699 Independent Study (1-3:0:0). Prerequisites Baccalaureate degree in music and permission of the music faculty and the department chair. Individual research and study in one of the areas of concentration available in the master of arts degree with a major in music. May be taken for a maximum of six credits.

798 Graduate Recital (1:0:0). Prerequisite At least three credits in Graduate Private Music Instruction in the area of concentration at the three-credit level. A public performance in the area of concentration.

800 Studies for the Doctor of Arts in Education (variable credit). Prerequisite Open only to D.A.Ed. students admitted to study in music. Program of studies designed by student's discipline director and approved by student's doctoral committee that brings the student to participate in the research, performing, or creative activity of the discipline director and results in a paper reporting the original contributions of the student. The paper is presented in a subsequent D.A.Ed. summer seminar. Enrollment may be repeated.

Graduate Private Music Instruction
To earn two or three credits per semester, a student takes 14 one-hour private music lessons. In Graduate Private Music Instruction—Accompanying, a number of these may be spent in a group-practicum situation at the instructor's discretion. The three-credit sequence is designed for students who work toward the M.A. degree with a concentration in performance, composition, conducting, or accompanying. Instruction is offered on the following: piano, organ, harp, classic guitar, voice, the standard band and orchestral instruments, composition, conducting, and accompanying. The private music instruction fee applies.

621, 622, 623, 624 Graduate Private Music Instruction—Composition (2:0:1 for each).

625, 626, 627, 628 Graduate Private Music Instruction—Composition (3:0:1 for each). Prerequisite for MUSI 621 and 625: Portfolio of compositions submitted to the faculty and an interview with a faculty committee.

641, 642, 643, 644 Graduate Private Music Instruction—Accompanying (2:0:1 for each).

645, 646, 647, 648 Graduate Private Music Instruction—Conducting (2:0:1 for each). Prerequisite for MUSI 641 and 645: Audition.

671, 672, 673, 674 Graduate Private Music Instruction—Instrumental/Vocal (2:0:1 for each).

675, 676, 677, 678 Graduate Private Music Instruction—Instrumental/Vocal (3:0:1 for each). Prerequisite for MUSI 671 and 675: Audition.

691, 692, 693, 694 Graduate Private Music Instruction—Conducting (2:0:1 for each).

695, 696, 697, 698 Graduate Private Music Instruction—Conducting (3:0:1 for each). Prerequisite for MUSI 691 and 695: Audition.
Nursing

Faculty

Allinger, Rita L., Ph.D., The Catholic University of America, 1974; Associate Professor
Carty, Rita M., D.N.Sc., The Catholic University of America, 1977; Professor
Cherry, Brenda J., Ph.D., University of Nebraska, Lincoln, 1981; Associate Professor
Connelly, Catherine E., D.N.Sc., The Catholic University of America, 1979; Associate Professor
Conti, Roberta M., M.S.N., University of Maryland, 1969; Assistant Professor
Dienemann, Jacqueline A., Ph.D., The Catholic University of America, 1983; Assistant Professor
Griffith, Hurdis, Ph.D., University of Maryland, 1984; Associate Professor
Harper, Doreen C., Ph.D., University of Maryland, 1980; Associate Professor
Johnson-Brown, Hazel J., Ph.D., The Catholic University of America, 1978; Professor
Lambert, Vickie A., D.N.Sc., University of California at San Francisco, 1981; Associate Professor
Liu, Yuen Chou, Ph.D., New York University, School of Education, 1972; Associate Professor
Silva, Mary E., Ph.D., University of Maryland, 1976; Professor
Vall, James D., D.N.Sc., The Catholic University of America, 1980; Associate Professor
Walker, Dorothy J., J.D., Boston College Law School, 1979; Professor

Nursing, M.S.N.

The Master of Science in Nursing program is accredited by the Virginia State Board of Nursing and the National League for Nursing. The program prepares nurses for a variety of leadership roles in the health care delivery system. The Adult or Gerontological Nurse Practitioner in Primary Care major is a collaborative program with George Washington School of Medicine and Health Sciences. The major 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 major in Nursing Administration prepares nurses to function in management positions in hospitals, nursing homes, community health agencies, and other health care facilities. A variety of health care settings are used for clinical practice experiences.

Admission Requirements

In addition to meeting the Graduate School admission requirements, an applicant to this program must have a cumulative grade point average of 3.00 (on a 4.00 scale) for the last 60 hours of undergraduate work, hold an active license as a registered nurse, submit three letters of recommendation, and submit the results of the general test of the Graduate Record Examination. Applicants must have successfully completed undergraduate statistics and research courses.

The Graduate School may offer provisional admission to a degree-seeking applicant even though all admission requirements for degree status have not yet been met if there is sufficient evidence to suggest the capacity to pursue graduate work. Students admitted provisionally must resolve all deficits and be moved to degree status by completion of 12 semester hours of graduate-level study.

Degree Requirements

The master's program in nursing requires 36 semester hours of graduate credit. Of these, a 9-hour core consists of course work in the theoretical foundations of nursing, approaches to data analysis in nursing research, and a seminar in concepts of nursing research. Twelve hours must be completed in the concentration areas of Adult or Gerontological Nurse Practitioner in Primary Care, Advanced Clinical Nursing, or Nursing Administration. The student has the option of writing a thesis or working on a research project.

Core Courses—Required of all students

NURS 755 Theoretical Foundations Related to Nursing (3)
NURS 759 Approaches to Data Analysis in Nursing Research (3)
NURS 790 Seminar in Concepts of Nursing Research (3)
NURS 791 Projects in Nursing Research (3) or
NURS 799 Thesis (3-6)

Nursing Majors—Select one major

Major in Adult or Gerontological Nurse Practitioner in Primary Care
NURS 622 Clinical Management in Primary Care (3)
NURS 746 Practicum in Primary Care I (3)
NURS 748 Practicum in Primary Care II (6)

Nursing Support Courses:
* NURS 552/HCS 205 Clinical Diagnosis and Management of Health Deviations (5)
* NURS 554/HCS 207 Advanced Health Assessment (1)
* Collisted with George Washington University School of Medicine and Health Sciences.

Related Discipline Support Courses:
HCS 206 Clinical Pathological Correlates (2)
PHARM 207 Pharmacology for New Health Practitioners (4)
Major in Advanced Clinical Nursing
NURS 773 Advanced Clinical Nursing I (3)
NURS 775 Advanced Specialty Practice I (3)
NURS 776 Advanced Clinical Nursing II (3)
NURS 778 Advanced Specialty Practice II (3)

Nursing Elective/Support Courses:
NURS 550 Pathophysiological Bases of Health Deviations (3)
NURS Elective (3)
Related Discipline Electives (6)

Major in Nursing Administration
NURS 763 Administrative Theory in Nursing (3)
NURS 765 Practicum in Nursing Administration I (3)
NURS 766 Administrative Strategies in Nursing (3)
NURS 768 Practicum in Nursing Administration II (3)

Nursing Elective/Support Courses:
NURS 654 Nursing Administration Financial Management (3) or
NURS 760 Health Care Finance (3)
NURS Elective (3)

Related Discipline Elective/Support Courses:
MGMT 612 Management Theory (3)
Related Discipline Elective (3)

D.N.Sc. in Nursing Administration

The Doctor of Nursing Science (D.N.Sc.) program in Nursing Administration prepares nurses for executive roles in a variety of educational and health-related settings. The student chooses a concentration in nursing education or nursing service. Objectives of the D.N.Sc. in the Nursing Administration program are to prepare nurse executives who will (1) demonstrate administrative skills that enable effective executive function in the chosen area of concentration, (2) synthesize research knowledge with decision making regarding participation in activities leading to the advancement of nursing science, and (3) analyze societal and governmental functioning to enable the exercise of leadership in the formulation and implementation of public policy in health care.

Admission Requirements

In addition to fulfilling the admission requirements of the Graduate School for degree status, the applicant must have earned a master’s degree from an accredited program and have a minimum grade point average of 3.25 on a 4.00 scale in the master’s program. The applicant must submit evidence of three years of nursing experience, at least one year of which must have been postbaccalaureate and in the selected area of concentration, nursing education, or nursing service. Graduate Record Examination (GRE) scores in the quantitative, verbal, and analytic areas must be submitted, along with evidence of current licensure to practice professional nursing. (Students on a foreign student visa must present evidence of professional standing in their respective countries.) The applicant must also provide evidence of professional liability insurance coverage and submit three letters of recommendation: one from an academic source, one from an administrative superior in the most recent position, and one from an administrative superior in the selected area of concentration. (If the latter two requirements are met by the same letter, the applicant must submit a third letter of recommendation from a professional nursing employment source.)

The Graduate School may offer provisional admission to a degree-seeking applicant even though all admission requirements for degree status have not been met if there is sufficient evidence to suggest capacity to pursue graduate work. Students admitted provisionally must resolve all deficits and be moved to degree status by completion of 12 semester hours of doctoral-level study.

Degree Requirements

In addition to Graduate School doctoral degree requirements, students must satisfy the specific D.N.Sc. degree requirements. To earn the D.N.Sc. degree at George Mason University the doctoral candidate must have earned a minimum of 90 graduate-level semester credits beyond the baccalaureate degree and a minimum of 60 graduate-level semester credits beyond the master’s degree. A minimum of 48 graduate-level semester credits after admission to degree or provisional status in the D.N.Sc. program at George Mason University are required, 36 of which must have been earned at George Mason University. The candidate may transfer a maximum of 12 graduate-level credit hours toward the D.N.Sc. degree, but may present only graduate-level credits in which satisfactory grades have been earned and which meet the requirements of the D.N.Sc. curriculum.

A written qualifying examination must be successfully completed in addition to the program of studies outlined in the curriculum of the D.N.Sc. program in Nursing Administration. Successful completion of a dissertation for which 12 credits are awarded but to which no grade is assigned and the final oral doctoral examination are required.

Program of Study

The curriculum of the D.N.Sc. program in Nursing Administration includes the nursing core (30 semester hours), cognate core (3 semester hours), research core (15 semester hours), and nursing and related discipline electives (12 semester hours). The Student Doctoral Advisory Committee, composed of three graduate faculty members, at least two of whom are in the School of Nursing, is appointed during the first half of the semester in which the student is enrolled in the 15th to 16th graduate-level credits. The Committee approves the student’s program of study for the D.N.Sc. degree, which also must be approved by the dean of the Graduate School by the end of the semester in which the committee is appointed.

Internship in Nursing Administration

Students are required to enroll in a two-semester internship, NURS 865-868, Internship in Nursing
Continuing Nursing Education

See Certificates, Programs and Additional Graduate Courses.

Nursing Courses (NURS)

550 Pathophysiologic Bases for Major Health Deviations of Individuals (3:3:0). Health deviations in individuals occurring in the U.S. which require long-term and/or terminal health care interventions. Presented within developmental framework, as they influence physiologic integrity at the cellular level. Focus on the human being as a whole open system. Complex health programs from the perspective of maintaining homeodynamics.

*552/HCS 205 Diagnosis and Management of Health Deviations (5:5:0). Common health deviations occurring in adults of all ages. Emphasis placed on the normal physiological and pathophysiological aspects of system functioning. Course focuses on the systematic assessment and management of health deviation, which are foundational to clinical decision making for adult and gerontological nurse practitioners in primary care.

*554/HCS 207 Practicum In Advanced Health Assessment (1:0:3). Application of advanced health assessment skills and clinical decision making with adults of all ages in primary care settings. The performance of skills and techniques needed to collect data for comprehensive health assessment is emphasized in this supervised practicum by nurse practitioner faculty preceptors.

570 Cultural Dimension of Aging (3:3:0). Impact of cultural definitions of aging, research methodologies, and findings of cross-cultural studies. Implications for health care and nursing.

611 Anthropology of Health (3:3:0). Cross-cultural issues of health and illness are explored from the standpoint of medical anthropology theory. Cultural dimensions of the developmental cycle and health care systems.

612 Health Care and the Political Process (3:3:0). Explores issues of power, political and legislative action as they relate to nursing. Effects of political establishment on nursing practice.

621 Components of Health Appraisal (3:2:3). Principles, skills and techniques in health appraisal of clients of all ages. Methods of recording, interpreting, and auditing problem-oriented profiles provide a framework for development of a health appraisal data base.

622 Clinical Management In Primary Care Nursing (3:3:0). Students should be currently enrolled in, or have completed, the courses in their nursing major. Students with an M.S.N. from an accredited nursing program will be considered on an individual basis. Analysis of the scope of the advanced nurse clinician role in the management of primary care nursing. An integrated approach to the assessment and management of common physical and psychosocial health problems.

*Colisted with George Washington University School of Medicine and Health Sciences.
Advanced skills in biopsychosocial assessment and development of plans for health maintenance.

625 Entrepreneurial Nursing Practice (3:3:0). Overview of designs for independent practice and their conceptual frameworks. Problems inherent in pioneering a private nursing practice are delineated with opportunities to explore innovative approaches and alternatives for independent nursing practice.

626 Nursing Informatics and Computer Systems (3:3:0). Study of information and data management in nursing and the application of computer systems to solve problems of nursing practice, education, administration, and research. Course focuses on generic concepts of information science and the use of computers to manage nursing health care data, incorporating computing skills for using specific software packages.

640 Interpersonal Dimensions in Nursing (3:3:0). Examination of interpersonal relationships in which nurses are involved in various aspects of nursing leadership and advanced professional practice. Relates theoretical foundations to the effective development of relationships within the framework of the nursing process.


650 Health Care and Law (3:3:0). Survey course designed to introduce students to the impact of courts and legislatures on rights and responsibilities of health care consumers and health care providers. Focus is on definitions of standards of care, legal theories of liability, and legally effectual consent.

654 Nursing Administration Financial Management (3:3:0). Investigation of managerial technologies related to financial planning and control functions of mid-level nurse administrators. Develops knowledge and skills prerequisite to effective participation in financial activities of program development and management.

655 Quality Assurance in Health Care (3:3:0). Issues, trends, and methodologies in nursing quality assurance with particular emphasis on roles and responsibilities of the nurse middle manager in health-related agencies.

656 Seminar In Supervision In Health Care Agencies (3:3:0). Prerequisite Completion of MGMT 301, MGMT 610 or equivalent. Synthesis of role and functions of the professional nurse supervisor and the process of supervision in facilitating the provision of nursing care to clients in health care agencies.

657 Overview in Nursing Education (3:3:0). Prerequisite Admission to the graduate nursing program or post-master's status. Focus on history and philosophy of nursing education; principles and methods of teaching and learning used in nursing; and current issues, trends, and research in nursing education.

658 Practicum and Seminar in Nursing Education (3:6:2:7). Prerequisite Admission to the graduate nursing program or post-master's status; NURS 657 is pre- or corequisite. Analysis and application of the dynamics of nursing education. Emphasis on selected curriculum designs with application of instructional strategies appropriate to implementing selected programs.


690 Independent Study in Nursing (1-3:3:0). Prerequisite Admission to graduate nursing program and permission of associate dean for academic programs. In-depth study of a selected area of nursing theory, research or practice under the direction of faculty. May be repeated but the total credit hours earned may not exceed three.

698 International Nursing: Theoretical and Practical Dimensions (3:3:0). International nursing organizations, programs, and projects in relation to comparative health care systems. Theoretical conceptualization, research approaches, and methodological issues in the development of international nursing.

699 Practicum in International Nursing (3:1:8). Pre- or corequisite: NURS 698, International Nursing: Theoretical and Practical Dimensions. Practicum in International Nursing in a selected international health agency. The nursing programs are analyzed using a health care systems framework.

746 Practicum in Primary Care Nursing I (3:2:7). Analysis of the scope of the nurse practitioner role in the management of adult primary care. An integrated approach to the assessment and management of common physical and psychosocial health care problems. Advanced skills in biopsychosocial assessment and development of plans for health maintenance. Clinical specialty track option for primary care of adults or the elderly.

748 Practicum in Primary Care Nursing II (6:2:16). The nurse practitioner student progressively assumes increased responsibility in the delivery of primary care (to the elderly and other adult medically underserved groups). Clinical specialty track option for primary care of adults or the elderly in a one-semester practicum.

750 Legal Issues Relevant to Health Care Administration (3:3:0). An examination of federal, state, and local statutes and regulations that impinge upon the operation of health-care agencies and health-care education enterprises.

755 Theoretical Foundations Related to Nursing (3:3:0). Prerequisite Admission to graduate nursing program. Assumptions,
concepts, and propositions inherent in selected nursing and related discipline theories.

759 Approaches to Data Analysis in Nursing Research (3:3:0). Prerequisite Admission to graduate nursing program. Examination of uni- and bivariate procedures appropriate for analyzing nursing research data. Emphasis on selection and application of procedures in relation to level of data and type and size of sample in nursing research.

760 Health Care Financial Management (3:3:0). Prerequisite Admission to the Graduate School or master’s degree. Investigation of selected theory, decision analysis, and techniques of accounting and financial management in health care administration. Develops the knowledge and skills prerequisite to effective participation in a health institution’s financial planning and analysis. Course includes lecture, seminar, case study, and microcomputing experience.

783 Administrative Theory in Nursing (3:3:0). Prerequisite Admission to the graduate nursing program; NURS 755 and MGMT 610 or equivalent are pre- or corequisites. Utilization of administrative theory and management principles and processes as related to roles and functions of the nurse in management in health-related agencies.

765 Practicum in Nursing Administration I (3:1:8). Prerequisite Admission to graduate nursing program; NURS 755. NURS 763 is pre- or corequisite. Application of administrative theory and management principles and processes in a selected health-related agency. Roles and functions of the nurse in management. Lab arranged.

766 Administrative Strategies in Nursing (3:3:0). Prerequisite NURS 763. Roles and functions of the nurse in management as the nurse manager develops patterns of nursing care, articulating nursing education and nursing service.

768 Practicum in Nursing Administration II (3:1:8). Prerequisites NURS 763, 765; NURS 766 is pre- or corequisite. Implementation and integration of the roles and functions of the nurse in management. Emphasis on using appropriate management principles and processes in a selected health-related agency. Lab arranged.

773 Advanced Clinical Nursing I (3:3:0). Prerequisites Admission to graduate nursing program, course in health assessment. NURS 755. Foundational theory relevant to the biophysical, psychological, and cultural self-care needs of individuals and families who have long-term care needs. Emphasis on potential long-term problems across the life span; includes elderly and chronically ill.

775 Advanced Specialty Practice I (3:2:7). Prerequisite Admission to graduate nursing program, NURS 755, course in health assessment, pre- or corequisite NURS 773. Opportunity to apply the nursing process as it relates to the care of individuals and families with existing or potential long-term health problems in a selected clinical setting. Lab arranged.

776 Advanced Clinical Nursing II (3:3:0). Prerequisite NURS 773. Expansion of selected content in long-term care as it relates to advanced clinical nursing practice. Collaboration with other health care providers in groups and communities is examined. Emphasis on evaluation of nursing care and advanced standards of practice.

778 Advanced Specialty Practice II (3:2:7). Prerequisite NURS 773, 775; NURS 776 is pre- or corequisite. Opportunity to apply roles of an advanced nurse clinician in a selected clinical setting. Lab arranged.

790 Principles and Methods of Nursing Research (3:3:0). Prerequisite Admission to graduate nursing program. NURS 755, 759. NURS 763, 773, 783 are pre- or corequisite. Principles and methods of nursing research applied to problem identification, research design, and data collection and measurement.

791 Projects in Nursing Research (3:0:0). Prerequisite NURS 790. Research projects by students, individually or in groups, under direction of faculty.

799 Thesis (3:6:0:0). Prerequisite NURS 790. Exploration of a nursing problem using appropriate research methodology under supervision of graduate faculty member(s).

800 Contemporary Health Care Issues Seminar (3:3:0). Focus is on executive decision making related to contemporary issues affecting administration in nursing education and nursing service.

863 Health Care Administration (3:3:0). Focus is on creating awareness of the principal underlying forces that will influence the role of the nurse executive in the care delivery system, including educational and service environments.

864, 866 Internship in Health Care Administration (6:1:17), (6:1:17). Experiential learning in nursing administration in an educational or service enterprise (depending on concentration chosen). The internship spans two consecutive semesters and includes planned seminars.

866 Health Care Public Policy (3:3:0). Focus on the process of formulating health care policy and analyzing its implications for nursing administration in nursing education and nursing service. Current and impending health issues, the legislative process, and program implementation evaluation will be examined.

955 Nursing Science (3:3:0). A critical assessment and synthesis of the process of development and testing of theoretical foundation of nursing science.

990 Advanced Empirical Nursing Research Seminar (3:3:0). An in-depth examination of advanced principles of empirical research methodologies from the formulation of the research question to preparation of data for analysis. The student is expected to develop and defend an appropriate proposal in nursing administration.
999 Doctoral Dissertation (9:0:0). This course provides continued faculty assistance on an individual basis toward the completion of the approved dissertation.

George Washington University Courses:

PHARM 207: Pharmacology for New Health Practitioners. Drugs and their actions. Principles of pharmacology and drugs, including their therapeutic and toxic action and their fate in the body. Admission by permission of instructor.

HCS 205: Clinical Pathological Correlates. Analysis of varied cases using student participation in decision making formulation. Students learn to correlate pathophysiology with symptom manifestation. Emphasis on interpretation of historical and physical examination data, laboratory data and radiographic studies relevant to the health problems discussed. Appropriate pharmacologic and nonpharmacologic therapies are discussed, in conjunction with the theoretical basis for selection of specific therapies.

Continuing Nursing Education

See Certificates and Additional Graduate Courses.

Operations Research and Applied Statistics

Faculty

Boelstein, A. Richard, Ph.D., Purdue University, 1967; Associate Professor
Gantz, Donald T., Ph.D., University of Rochester, 1974; Associate Professor
Greenberg, Irwin, Eng.Sc.D., New York University, 1964; Professor
Harris, Carl M., Ph.D., Polytechnic Institute of New York, 1966; Professor
Hoffman, Karl L., Sc.D., The George Washington University, 1975; Associate Professor
Jo, Kyung Y., Ph.D., North Carolina State University, 1982; Assistant Professor
Miller, John J., Ph.D., Stanford University, 1974; Associate Professor
Nash, Stephen, Ph.D., Stanford University, 1982; Associate Professor
Richey, Michael, Ph.D., Georgia Institute of Technology, 1985; Assistant Professor
Schum, David A., Ph.D., Ohio State University, 1964; Professor
Sofer, Arlela, Sc.D., The George Washington University, 1984; Assistant Professor
Sutton, Clifton, Ph.D., Stanford University, 1987; Assistant Professor
Wegman, Edward J., Ph.D., University of Iowa, 1968; Dunn Professor

Operations Research and Management Science, M.S.

The graduate program leading to a Master of Science in Operations Research and Management Science is designed to equip students for research and professional practice associated with the formulation and analysis of mathematical models for decision making, and their computer implementation. Major components of the program include mathematical programming, queuing and network theories, computer simulation and modeling, applied and computational probability and statistics, and the application of these 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 OR/MS and statistical methods.

http://catalog.gmu.edu
To achieve this objective, the program includes core courses and electives selected by the student with the aid of a faculty adviser. To obtain the master of science degree, students complete an approved plan of study that contains a minimum of 33 semester hours of graduate-level course work.

Students may take courses through the Cooperative Graduate Engineering Program, in affiliation with the University of Virginia and Virginia Tech. Appropriate courses may be transferred, with adviser approval, into this GMU degree program. Refer to section on Certificates, Programs, and Additional Graduate Courses in this catalog.

Admissions Requirements
To be admitted to the program, a candidate must:
1. Fulfill all admission requirements of the Graduate School;
2. Hold a baccalaureate degree and have taken the following courses or their equivalents:
   MATH 113, 114, 213: Calculus, including calculus of several variables
   STAT 344: Applied Probability
   MATH 303 or 322: Matrix Algebra or Linear Algebra;
3. Have a knowledge of at least one scientific computer programming language;
4. Have three letters of recommendation submitted by former professors or supervisors.

A student with deficiencies in preparation may be accepted provisionally pending removal of the deficiencies. Courses taken to remove admission deficiencies cannot be counted toward the degree.

Degree Requirements
The program consists of 33 credits, divided as follows. The core curriculum will consist of the following five courses (15 credits):
   OR 541 Operations Research I
   OR 542 Operations Research II
   OR 743 Seminar in Applications of Management Science
   STAT 644 Applied Probability
   STAT 654 Applied Statistics

Three additional 600-level methodology courses (nine credits) designated OR must be chosen. At least one course must be selected from the group 641, 642, 643, 644; and one from the group 645, 647, 648, 746.

Three additional elective courses are chosen with the concurrence of the student's adviser. These courses may be taken in an area appropriate to the student's interest, such as statistics, business administration, computer science, information systems, systems engineering, electrical and computer engineering, economics, psychology, mathematics, and public administration.

With the permission of their advisers, qualified students may elect to write a thesis in place of three credits of course work from the methodological or applications area.

Students whose primary interest is in statistics may choose a program leading to the M.S. degree in OR/MS with specialization in statistics. In addition to the core curriculum, students must complete three courses with a STAT designation, including STAT 652 plus two electives. One stochastic OR elective must also be selected, together with two more general electives chosen in concurrence with the student's adviser.

A third option is available to students particularly interested in systems applications. For this, the three required OR methodology courses must be chosen from OR 635, 641, 643, 647, 648, and 675. Furthermore, the three additional electives must include OR 677, plus any two other courses selected with adviser's approval from the offerings of the other departments in the School of Information Technology and Engineering.

Of particular importance to students planning a Ph.D. program in information technology are the core courses intended to satisfy the breadth requirement for the Ph.D. In Information Technology.

Operations Research Courses (OR)
540 Management Science (3:3:0). Prerequisite MATH 108 and 110, or equivalent. Operations research techniques and application to managerial decision making. Mathematical programming, Markov processes, queuing theory, inventory models, PERT and CPM, and simulation. Use of contemporary computer software for problem solving. OR/MS majors will not receive credit.

541 Operations Research I (3:3:0). Prerequisite MATH 303 or equivalent. Deterministic methods for solving real-world decision problems. The linear programming model and simplex method of solution, duality and sensitivity analysis, transportation and assignment problems, shortest path and maximal flow problems, introduction to integer and nonlinear programming. Emphasis on modeling and problem solving. Students who have taken MATH 441 will not receive credit.

542 Operations Research II (3:3:0). Prerequisite STAT 344, MATH 351 or equivalent. Probabilistic methods for solving decision problems under uncertainty. Probability review, project networks including PERT and CPM, queuing theory, inventory theory, Markov decision processes, reliability, decision theory and games, simulation. Emphasis on modeling and problem solving. Students who have taken MATH 442 will not receive credit.

635 Discrete System Simulation (3:3:0). Prerequisite STAT 354 and OR 542, or equivalents, and knowledge of a scientific programming language. Computer simulation as a scientific methodology in operations analysis, with emphasis on model development, implementation, and analysis of results. Discrete–event models, specialized languages, experimental design and output statistics. Lecture, project, and lab.

641 Linear Programming (3:3:0). Prerequisite OR 541 or permission of instructor. First, an in-depth look at the simplex method. Next,
computational enhancements: the revised simplex method; sparse-matrix techniques; bounded variables and generalized upper bounds; and large-scale decomposition methods. Computational complexity of the simplex algorithms. The Khachian and Karmarkar algorithms.

642 Integer Programming (3:3:0). Prerequisite OR 641 or permission of instructor. Cutting plane and enumeration algorithms for solution of integer linear programs; knapsack problem, matching problem, set covering and partitioning problems; applications to problems in OR/MS, such as capital budgeting, facility location, political redistricting, engineering design, and scheduling.

643 Network Modeling (3:3:0). Prerequisites OR 541 and OR 542. Introduction to network problems in operations research, computer science, electrical engineering, and systems engineering. Solution techniques for various classes of such problems are developed; students have hands-on experience with state-of-the-art software. Topics include minimal-cost network flow, maximal flow, shortest path, multiple-commodity transshipment, and generalized networks; plus stochastic networks, network reliability, and combinatorially based network problems. The complexity of each problem class is also analyzed.

644 Nonlinear Programming (3:3:0). Prerequisites MATH 213 or equivalent and knowledge of a scientific programming language. Optimization theory and techniques applicable to problems in engineering, economics, operations research, and management science. Convex sets and functions, optimality criteria and duality. Algorithms for unconstrained minimization, including descent methods, conjugate directions, Newton-type and quasi-Newton methods. Algorithms for constrained optimization, including active set methods and penalty and barrier methods.

645 Stochastic Models in Operations Research (3:3:0). Prerequisite MATH 351 or STAT 644; OR 542 is recommended. 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, stochastic networks. Emphasis on applications in practice as well as analytical models.

647 Queuing Theory (3:3:0). Prerequisite OR 542, STAT 644, or permission of instructor. A 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; statistical inference and simulation of queues.

648 Production and Inventory Systems (3). Prerequisites OR 541 and OR 542 or permission of instructor. Analysis of production-inventory systems. Introduction to the use of mathematical modeling for solutions of production planning and inventory control problems. Stochastic inventory systems of lot sized-reorder type; periodic review and single period models. Application of dynamic programming theory to deterministic and stochastic cases. Static and dynamic production-planning models.

649 Topics In Operations Research (3:3:0). Prerequisite Permission of instructor. 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, combinatorics.

676 Dynamic Programming (3:3:0). Prerequisites OR 541 and 542. Introduction to the theory and computational aspects of dynamic programming. The course studies sequential decision processes, optimal resource allocations, continuous-time dynamic programming, network models, Markov decision processes, and production models. Special attention is directed toward applications.

677/STAT 677 Quality Assurance (3:3:0). Prerequisite STAT 610, 654 or equivalent. Introduction to the concepts of quality control and reliability. Acceptance sampling, control charts and economic design of quality control systems are discussed, as is system reliability, fault-tree analysis, life testing, repairable systems, and the role of reliability, quality control, and maintainability in life-cycle costing. The role of MIL and ANSI standards in reliability and quality programs is also considered.

743/DESC 743 Applications Seminar (3:3:0). Prerequisites OR 541 and 542 or DESC 742. Model development and implementation involved in the practice of operations research and management science.

744/DESC 744 Contemporary Issues In Decision Analysis (3:3:0). Prerequisite OR 542 or DESC 611. Application of analytic reasoning and skills to practical problems in decision making. Topics include problem structure, analysis and solution implementation, emphasizing contemporary approaches to decision analytic techniques.

746 Stochastic Models in Operations Research II (3:3:0). Prerequisite OR 645 or permission of instructor. Advanced applied probability models in Markov decision processes, semi-Markov decision processes, Brownian motion, random walks and martingales, stochastic order relations, queuing networks. Recent developments in the area will also be presented.

Statistics Courses (STAT)

610 Statistical Foundations for Technical Decision Making (3:3:0). Prerequisite Six credits of math. The use of statistical methods as scientific tools in the analysis of practical problems. Topics include descriptive statistics, probability theory; distributions; sampling, inference-estimation and hypothesis testing; elementary decision theory; time series analysis; linear regression and correlation; the analysis of variance. Credits not applicable toward M.S. (OR/MS).
612/CS 812 The Use of Computer Statistical Packages (3:3:0). Prerequisite Course in statistics. Introduction to use of computer packages in the statistical analysis of data. Emphasizes techniques common to use of all statistical packages, including data checking, cleaning, manipulation, and transformation. Both simple and complex statistical analyses are covered. Techniques are illustrated by concentrating on one of the major statistical packages such as SAS or SPSS. Other packages are discussed and compared. Students are expected to perform computer statistical analyses of data relevant to their respective fields of study. Credits are not applicable toward the 30 credits required for the M.S. In mathematics or CS, but may be applicable toward a degree in some other fields.

644 Applied Probability (3:3:0). Prerequisite STAT 344 or MATH 351. A course in probability with applications in computer science, engineering, operations research, and systems engineering. Random variables and expectation, conditional expectation, random vectors, special distributions, parameter estimation, limit theorems, stochastic processes. Problems in engineering, operations research, and computer systems.

652 Statistical Inference (3:3:0). Prerequisite STAT 644, ECE 528, or equivalent. Critical aspects of probability, random variables and distributions, characteristics functions, and stochastic convergence. Optimal estimation, maximum-likelihood estimation, asymptotic theory, Bayesian methods, likelihood-ratio tests, statistical decision theory, sequential methods.

653 Survey Sampling (3:3:0). Prerequisite A course in probability or statistics. Review of probability and statistics, basic definitions of sampling, simple random sampling, stratified sampling, systematic sampling, cluster sampling, estimation problems. Emphasizes practical problems encountered in conducting a survey as well as the theoretical background.

654 Applied Statistics (3:3:0). Prerequisite STAT 344, MATH 351, or equivalent. Sampling theory, estimation, hypothesis testing, comparison of data, various classical tests, linear models and analysis of variance, decision theory.

655 Analysis of Variance (3:3:0). Prerequisite STAT 654 and a working knowledge of matrix algebra. Single and multifactor analysis of variance, planning sample sizes, introduction to the design of experiments, random block and Latin square designs, analysis of covariance.

656 Regression Analysis (3:3:0). Prerequisite STAT 654 and a working knowledge of matrix algebra. Simple and multiple linear regression and correlation, polynomial regression, general regression, search techniques for best regression equation, multicollinearity, autocorrelation, normal correlation models.

657 Nonparametric Statistics (3:3:0). Prerequisite STAT 654 or equivalent. Nonparametric procedures for two or more samples (independent as well as correlated), tests of significance and estimation methods, independence problems with nominal and rank data, comparison of parametric vs. nonparametric methods. Emphasis on application of nonparametric techniques to data.


659 Topics in Statistics (3:3:0). Prerequisite Permission of instructor. Topics in statistics not covered in the regular statistics sequence. May be repeated for credit.

677/OR 677 Quality Assurance (3:3:0). Prerequisite STAT 610, 654 or equivalent. Introduction to the 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. The role of MIL and ANSI standards in reliability and quality programs is also considered.
Physical Education

Faculty
Bever, David, Ph.D., Purdue University, 1978; Associate Professor
Crawford, Scott A.G.M., Ph.D., University of Queensland, 1985; Associate Professor
Metcalf, James A., Ph.D., University of Maryland, 1970; Associate Professor
Ruhling, Robert O., Ph.D., Michigan State University, 1970; Professor
Schack, Frederick K., Ph.D., Ohio State University, 1976; Associate Professor
Stein, Julian U., Ed.D., George Peabody College, 1966; Professor

Physical Education, M.S.

This program is designed to serve needs of those currently employed in teaching, sport, or fitness fields; those with baccalaureate degrees in physical education who desire to improve their skills before entering a career; and those who wish to earn a master’s degree as a prelude to additional graduate work in physical education, exercise science, or related areas. Students may emphasize teaching or exercise science in selecting a degree program.

Admission Requirements
In addition to fulfilling Graduate School admission requirements, the applicant must hold a bachelor’s degree in physical education or a related field; must submit three letters of recommendation and transcripts of all college course work; and must have completed courses in human anatomy and physiology, kinesiology, and exercise physiology. Applicants who do not meet these requirements may be offered provisional or nondegree status in accordance with the general regulations of the Graduate School.

Departmental Program Options and Degree Requirements
In addition to fulfilling the Graduate School degree requirements, the candidate must complete the following program:

Core Courses (Semester Hours)
(12 hours required of all students)
EDUC 590 Education Research (3)
EDUC 591 Education Statistics (3)
PHED 508 Seminar in Special Physical Education (3)
PHED 604 History of Sport and Physical Education through the Middle Ages (3) or PHED 605 History of Sport and Physical Education from Renaissance to Present (3)

Support Area Courses (12–18 hours)
HEAL 612 Scientific Foundations of Health and Fitness (3)
PHED 610 Advanced Exercise Physiology and Sports Medicine (3)
PHED 618 Motor Behavior and Development (3)
PHED 630 Exercise, Health and Fitness Program Development (3)
PHED 50 Scientific Principles of Motor Learning (3)
PHED 660 Management and Administration of Physical Education and Sports (3)
PHED 671 Teaching Physical Education in the Secondary School (3)
PHED 673 Program Development in Physical Education and Sport (3)
PHED 680 Seminar in Current Issues in Physical Education and Sport (3)
PHED 799 Thesis (6)

Comprehensive examinations (written) must be completed successfully at the end of course work and prior to beginning the thesis. Students selecting the thesis option are also required to present an oral defense of their thesis.

Two program patterns are available:

Non-Thesis Option

<table>
<thead>
<tr>
<th>Course</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core</td>
<td>12 hours</td>
</tr>
<tr>
<td>Support Area</td>
<td>18 hours</td>
</tr>
<tr>
<td>Thesis Option</td>
<td>30 hours</td>
</tr>
<tr>
<td>Core</td>
<td>12 hours</td>
</tr>
<tr>
<td>Support Area</td>
<td>12 hours</td>
</tr>
<tr>
<td>Thesis</td>
<td>6 hours</td>
</tr>
<tr>
<td>Total</td>
<td>30 hours</td>
</tr>
</tbody>
</table>

Two major options are available:

Teaching including such areas as teaching, administration, supervision, curriculum development, developmental/ adapted physical education. Representative of Support Area courses for this option are:

PHED 660 Management and Administration of Physical Education and Sports (3)
PHED 671 Teaching Physical Education in the Secondary School (3)
PHED 673 Program Development in Physical Education (3)

Exercise Science including such areas as exercise physiology, sport management, and fitness/wellness management. Representative of support area courses for this option are:

PHED 610 Advanced Exercise Physiology and Sports Medicine (3)
PHED 630 Exercise, Health, and Fitness Program Development (3)
HEAL 612 Scientific Foundations of Health and Fitness (3)

These patterns and options enable students to identify their personal goals and professional directions more precisely through 12 hours of core courses and 12-18 hours of support area courses according to personal interests and professional directions of each student.

Graduate Assistantships

Administrative, research, and teaching-related graduate assistantships are available in the Department of Health, Sport, and Leisure Studies. Persons awarded assistantships may be assigned to one or more of the various programs, services, or faculty in the department. To be eligible for an assistantship, a student must be admitted to degree status and take a minimum of six semester hours of graduate credit each semester. Interested students should contact the Department of Health, Sport, and Leisure Studies office for applications. Information about other types of graduate financial assistance is in the Tuition, Expenses, and Financial Aid section of this catalog.

Physical Education Courses (PHED)

500 Workshop in Physical Education (1-3:0:0). Prerequisite Graduate standing or permission of instructor. Concentrated full-time workshops, weekend seminars and workshops dealing with selected topics in physical education and ancillary fields. May be repeated. No more than six semester hours may be applied for degree credit.

508 Seminar in Special Physical Education (3:3:0). Prerequisite Graduate standing or permission of instructor. Discussion of current problems, issues, and research in special physical education. Practica may be included.

599 Independent Study in Physical Education (1-3:0:0). Prerequisite Graduate standing or permission of instructor. Study of a problem area in physical education research, theory, or practice under the direction of faculty. May be repeated, but no more than three hours total credit may be earned.

604 History of Sport and Physical Education through the Middle Ages (3:3:0). Prerequisite Graduate standing or permission of instructor. Role of sport and physical education in ancient civilizations through the Middle Ages.

605 History of Sport and Physical Education from Renaissance to Present (3:3:0). Prerequisite Graduate standing or permission of instructor. Role of sport and physical education in Europe and its impact on developments in America.

610 Advanced Exercise Physiology and Sports Medicine (3:3:0). Prerequisite PHED 450, graduate standing or equivalent or permission of instructor. Lecture, demonstration, laboratory research and seminar experiences in the application of research findings to the understanding of physiological function and the effects of exercise on people.

616 Motor Behavior and Development (3:3:0). Prerequisite Graduate standing or permission of instructor. Human motor behavior development and theory with application to evaluation of skill acquisition.

630 Exercise, Health and Fitness Program Development (3:3:0). Prerequisite Graduate standing or permission of department. Health and exercise program development related to fitness and health of special adult populations. Three to six hours of field experience.

650 Scientific Principles of Motor Learning (3:3:0). Prerequisite Graduate standing or permission of instructor. Biomechanical analysis and application of scientific principles of movement to instructing sport skills in physical education and sport programs.

660 Management and Administration of Physical Education and Sports (3:3:0). Prerequisite Graduate standing or permission of instructor. Advanced study in fiscal management, legal liability, facility planning, and policy development.

671 Teaching Physical Education in the Secondary School (3:3:0). Prerequisite Graduate standing or permission of instructor. Advanced study of methods, materials, content and organization of physical education programs. Emphasis on curriculum planning, current methodologies, and trends.

673 Program Development in Physical Education and Sport (3:3:0). Prerequisite Graduate standing or permission of instructor. Curriculum design and program development with attention to organization and implementation of physical education and sports programs.

680 Seminar in Current Issues in Physical Education and Sport (3:3:0). Prerequisite Graduate standing or permission of instructor. Identify and analyze current issues in physical education and sport.

799 Thesis (3-6:0:0). Prerequisite Graduate standing or permission of instructor. Exploration of a physical education problem using appropriate research methodology under supervision of graduate faculty member(s).
Physics

Faculty
Ceperley, Peter, Ph.D., Stanford University, 1973; Associate Professor
dworzecka, maria, Ph.D., Warsaw University, Poland, 1969; Associate Professor
ehrl ich, Robert, Ph.D., Columbia University, 1984; Professor
eil worth, Robert, Ph.D., University of Rochester, 1965; Associate Professor
kafatos, Minas, Ph.D., Massachusetts Institute of Technology, 1972; Professor

Applied and Engineering Physics, M.S.

The Master of Science in Applied and Engineering Physics is a two-track program. The applied physics track 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, computer science, and other related areas. The engineering physics track, jointly administered with the Department of Electrical and Computer Engineering, allows more flexibility in selecting a larger fraction of courses in electrical engineering.

All courses are offered during late afternoon or evening hours to allow full-time employed persons to attend easily. Persons employed at area high technology organizations may take up to six credits (out of 33) for work done "on the job" under the guidance of a faculty member. This employment-related research may be conducted either under an optional three-credit research project or an optional six-credit master's thesis. Master's students who are not employed full time may apply for financial aid or for a limited number of research assistantships.

Admission Requirements

Those holding a baccalaureate degree in physics or a related field from an accredited institution, and who earned a GPA of 2.75 (out of 4.00) in their last 60 hours are invited to apply for admission. If the baccalaureate degree is in a field other than physics, the applicant should have taken several courses beyond the introductory physics courses, such as junior-level classical mechanics, electricity, and magnetism or electronics. An applicant may be required to make up one or two deficiencies, based on a graduate physics adviser's assessment, and still be permitted to enroll in the program. Two letters of recommendation must be submitted, preferably from former professors. The Graduate Record General examination and the GRE subject test in physics are recommended for applicants who received their baccalaureate degrees within the last five years. A less recent bachelor's recipient may wish to present a statement of his/her work experience in lieu of the GRE.

Degree Requirements

Candidates for the degree must successfully complete 33 credits as follows:

1. For both tracks of the program, a nine-credit core consisting of:
   - PHYS 502 Quantum Mechanics I
   - PHYS 513 Electromagnetic Theory
   - PHYS 613 Physical Modeling and Simulation

   Students who completed PHYS 502 or its equivalent as undergraduates will be required to take PHYS 514 Quantum Mechanics II in its place. (Before 1986 a somewhat different set of core requirements applied—see earlier catalogs.)

2. For the applied physics track only, any three of the following five courses:
   - PHYS 510 Continuum Mechanics
   - PHYS 511 Statistical Mechanics
   - PHYS 512 Solid State Physics
   - PHYS 514 Quantum Mechanics II
   - PHYS 610 Modern Instrumentation

3. Electives to complete the 33-credit program chosen from courses in physics, engineering, mathematics, or computer science subject to the following conditions:
   a. For the engineering physics track, at least nine credits of engineering are required.
   b. For either the applied physics or engineering physics track, no more than six credits may be chosen from areas outside engineering or physics.
   c. Credit may be received for 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 performed at a student's place of employment with the concurrence of a faculty adviser. The thesis is a more substantial piece of work performed under the supervision of a major professor and requires the student to make an oral defense. ECE/PHYS 798 may be taken only once.

All candidates for the degree must pass a comprehensive examination administered once a year in May.

Astronomy Course (ASTR)

505 Fundamentals of Astronomy (3:3:0). Prerequisite Graduate standing or permission of instructor. Emphasis on the connection of astronomy to other disciplines as well as recent developments in astronomy. Planet earth, its origin and past history, and the origin of life. Ancient, Renaissance, and modern astronomers. Basic physics. Tools of the astronomer. The solar
system, the sun, stars, and our galaxy. Quasars, general relativity and cosmology. Recommended for teachers of general science.

Physics Courses (PHYS)

500 Physics for High School Teachers (3:3:0). Prerequisite Certification as a secondary school physics instructor or permission of department. Techniques of teaching high school physics. Introduction to modern physics with emphasis on concepts rather than mathematical formalism. Recent developments in physics.

501 Physics Laboratory Techniques for High School Teachers (3:3:0). Prerequisite Graduate standing. Theory and performance of experiments applicable to high school teaching with practical sessions on use of lab apparatus and computer. Recommended for high school teachers of physics.

502 Introduction to Quantum Mechanics and Atomic Physics (3:3:0) (Same as PHYS 402). Prerequisite PHYS 303 or permission of instructor. Experimental basis of quantum mechanics: the wave function; systems in one, two, and three dimensions.

510 Mechanics of Continuous Media (3:3:0). Prerequisite PHYS 303 and 305. Study of continuous media. Includes physical perspective, mathematical formulation, and solution of problems in ideal fluids, viscous fluids, waves in fluid media, turbulence, thermal convection, stability considerations, elastic deformations, stress-strain tensor and body waves in elastic media.


512 Solid State Physics and Applications (3:3:0). Prerequisite PHYS 402 or 502. Crystal structures, binding, lattice vibrations, the free electron model, metals, semiconductors and semiconductor devices, super-conductivity, magnetism.

513 Applied Electromagnetic Theory (3:3:0). Prerequisite PHYS 305, 306, MATH 313, 314 or equivalent. Classical electromagnetic theory with applications. Topics include electrostatics, magnetic fields and materials, electromagnetic wave propagation, wave guides, transmission lines, radiation, and antennas.


520 The Physics of Energy and Environmental Technology (3:3:0). Prerequisite B.A. or B.S. degree in natural science or mathematics or permission of instructor. Contemporary problems of energy and the environment with emphasis on the underlying principles of physics within the constraints of engineering and economics. Intended for those pursuing careers in energy research and development, business administration, economics, ecology, and high school science instruction.

530 Astrophysics (3:3:0). Prerequisites PHYS 342 or 351 and MATH 113 or 115. Topics include physical concepts, magnitudes of stars, Hertzsprung-Russell diagram, stellar radiation, interstellar matter, dust, molecules, and other topics.

531 Relativity and Cosmology (3:3:0). Prerequisites PHYS 352; MATH 214 or 216, and PHYS 303, 305, or permission of instructor. Special relativity, 4-dimensional space-time, general relativity, non-Euclidean geometries, geodesic 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.


540 Nuclear and Particle Physics (3:3:0). Prerequisite PHYS 502. 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; nuclear science and technology.


590 Selected Topics in Physics (3:3:0). Prerequisite Graduate standing or permission of department. Selected topics from recent theoretical developments and applications. Designed to satisfy the needs of the professional community to keep abreast of current developments.

610 Modern Instrumentation (3:3:0). Prerequisites PHYS 513 and an electronics course. 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.

612 Physics of Modern Imaging (3:3:0). 
Prerequisite PHYS 513. Study of imaging methods using acoustic and electromagnetic waves to probe extended objects, and mathematical transformations to produce images from the scattered waves. Topics include classical imaging, physical optics, Fourier transform, holography, tomography, seismic mapping, underwater acoustic imaging and mapping, side-looking radar, antenna arrays, and applicable computer methods.

613 Physical Modeling and Simulation (3:3:0). 
A study of algorithms used to solve problems in physics and engineering and their computer implementation, data handling and data processing techniques in physics and engineering.

620 Radiation Hydrodynamics (3:3:0). 
Prerequisites PHYS 303 and 305; PHYS 510 recommended or equivalent course in hydrodynamics. Study of high-temperature plasma flows in which radiative processes contribute significantly to the transfer of energy and momentum. Course includes review of tensor calculus and hydrodynamics formulation, dynamics of viscous and heat conducting fluids, relativistic fluid flow, waves, shocks, winds, radiative transfer, radiative contributions to plasma flows. Some applications to computer methods in modeling radiating plasma flows are included.

798 Research Project (3:0:0). Prerequisites 9 hours of graduate-level course work and permission of instructor. Project chosen and completed under the guidance of a graduate faculty member, which results in an acceptable technical report.

799 Master's Thesis (3-6:0:0). Prerequisites 9 hours of graduate-level course work and permission of instructor. Project chosen and completed under the guidance of a graduate faculty member, which results in an acceptable technical report and an oral defense.

800 Studies for the Doctor of Arts in Education (variable credit). Prerequisite D.A.Ed. admission to study in physics. Program designed by student's discipline director and approved by student's doctoral committee, which brings the student to participate in the current research of the discipline director and results in a paper reporting the original contributions of the student. The paper is presented in a subsequent D.A.Ed. summer seminar. Enrollments may be repeated.

---

**Psychology 153**

**Psychology**

**Faculty**

Allen, John A., Ph.D., North Carolina State University, 1971; Associate Professor

Ballas, James A., Ph.D., The Catholic University of America, 1980; Research Assistant Professor

Barocas, Ralph, Ph.D., Pennsylvania State University, 1964; Professor (Director of Clinical Doctoral Program)

Blaha, John, Ph.D., Ohio State University, Associate Professor

Boehm-Davis, Deborah A., Ph.D., University of California, 1980; Assistant Professor

Boneau, Alan C., Ph.D., Duke University, 1957; Professor

Buffardi, Louis C., Ph.D., Kansas State University, 1970; Associate Professor (Director of Applied Experimental Doctoral Program)

Denham, Susanne, Ph.D., University of Maryland, 1985; Assistant Professor

Erdwins, Carol J., Ph.D., Washington University, 1975; Associate Professor

Fleschner, Edwin A., Ph.D., Ohio State University, 1951; D.Sc. (Honorary), University of Edinburgh, 1982; University Professor of Psychology

Flinn, Jane M., Ph.D., The George Washington University, 1974; Associate Professor (Chair)

Friedman, Lee, Ph.D., Rice University, 1986; Assistant Professor

Gessner, Theodore L., Ph.D., University of Maryland, 1971; Associate Professor

Goel, G., Ph.D., State University of New York at Buffalo, 1979; Assistant Professor

Holt, Robert W., Ph.D., University of Illinois, 1978; Associate Professor

King, David J., Ph.D., University of Maryland, 1958; Professor

Lehman, Elyse B., Ph.D., The George Washington University, 1970; Associate Professor (Master's Program Coordinator)

Maddux, James E., Ph.D., University of Alabama, 1982; Associate Professor

Mandes, Evans J., Ph.D., The George Washington University, 1966; Professor

Mellinger, Jeanne C., Ph.D., University of Chicago, 1952; Associate Professor

---

http://catalog.gmu.edu
Areas of Study

Moretz, Walter J., Ph.D., Florida State University, 1970; Associate Professor
Pasnak, Robert, Ph.D., Pennsylvania State University, 1969; Professor
Pence, Earl, Ph.D., Virginia Polytechnic Institute, 1980; Adjunct Assistant Professor
Riskind, John H., Ph.D., Yale University, 1977; Associate Professor
Rugel, Robert P., Ph.D., Florida State University, 1971; Associate Professor
Sanford, James F., Ph.D., Kansas State University, 1971; Associate Professor
Smith, Robert F., Ph.D., University of Wisconsin, 1976; Associate Professor (Undergraduate Program Coordinator)
Smith, Virginia, Ph.D., University of Maryland, 1981; Adjunct Assistant Professor
Tyer, Zita E., Ph.D., Texas Tech University, 1968; Professor
Wahl, Otto F., Ph.D., University of Pennsylvania, 1974; Associate Professor
Weisman, David S., Ed.D., The Catholic University of America, 1979; Adjunct Associate Professor

Psychology, M.A.

The Department of Psychology offers an M.A. degree in industrial, school, life-span development, or general psychology. The department does not offer an M.A. in clinical or counseling psychology; therefore, most M.A. students may not enroll in the clinical skills courses such as psychological assessment and psychotherapy courses.

The industrial psychology specialization is designed to provide training in two areas. Students may specialize in industrial/organizational psychology, which focuses on the application of psychological knowledge and methods to industry, government, or other organizations. The second area of specialization within the industrial psychology specialization is human factors, which focuses on psychological knowledge regarding man-machine interfaces.

The school psychology specialization is designed to prepare students for endorsement as fully certified school psychologists in Virginia and in most other states. It is approved by the Virginia Department of Education and meets the standards of the National Association of School Psychologists and the Division of School Psychology of the American Psychological Association.

The life-span development specialization provides training in two areas. Students may specialize in either child development or gerontology. These specializations focus on the psychological knowledge in these two areas. Students interested in gerontology may also earn a certificate in this area (see section on Certificates in this catalog).

The general master's program is designed to provide students with a knowledge of the basic content areas in psychology. It emphasizes flexibility so that students may enroll in courses fitting their specific needs.

Admission Requirements

In addition to fulfilling the admission requirements of the Graduate School, applicants to the program are expected to have 15 hours in psychology including a course in statistics and a laboratory course in psychology. Results of the Graduate Record Examination, three letters of reference from professors or supervisors, and a departmental application are also required. In addition, applicants are asked to submit a biographical statement outlining their background and experience and describing their future goals in psychology.

Generally, an overall GPA of 3.00 for the last 60 undergraduate hours and a minimum of 3.25 in undergraduate psychology courses are required. Work experience, publications, or special recommendations may compensate for deficiencies in other qualifications.

Applicants must have admissions requirements completed by February 15 if they wish an early decision regarding admission to the program for the fall semester.

Financial Assistance

Financial assistance is available through graduate assistantships and various forms of grants, loans, or employment. Information and forms for financial aid are sent to applicants when their application is received by the Graduate School. The application deadline for financial aid requests is February 15.

Master of Arts in Industrial Psychology Specializing in Industrial/Organizational Psychology

Students must complete the following requirements:

- 30 semester hours of graduate credit
- 3 hours from PSYC 701 or 703
- 4 hours of PSYC 553
- 3 hours of PSYC 653
- 9 hours minimum of specialized courses including PSYC 636 and one of PSYC 631, 637, or 638; and one of PSYC 533, 632, or 635
- Practicum or Thesis: 6 hours, thesis only with permission of chair (optional)
- Electives: no more than 6 hours of department-approved electives from outside the department

Master of Arts in Industrial Psychology with Specialization in Human Factors Engineering

Students must complete the following requirements:

- 30 semester hours of graduate credit
- 3 hours from PSYC 701 or 702
- 4 hours of PSYC 553
- 3 hours of PSYC 653
- 9 hours minimum of specialization courses from PSYC 530, 634, 636, 637, and 638
- Practicum or Thesis: 6 hours, thesis only with permission of chair (optional)
Electives: no more than 6 hours of department-approved electives from outside the department

Master of Arts in School Psychology

Students must complete the following requirements. Specific course requirements are delineated during advising after admittance to the school psychology program.
60 hours of graduate credit
50 hours of required courses. Students must pass core courses with a grade of B or better. These courses must be passed prior to the internship and the awarding of the master’s degree.
One practicum is required during the second year of training at the Psychological Clinic of the University and the second may be completed in the school system.

At the conclusion of course work, students may choose to complete a thesis or practical research project concurrent with the internship. All students must complete a full year of internship.

Master of Arts in Life-Span Development with Specialization in Child Development

Students must complete the following requirements:
30 semester hours of graduate credit
PSYC 702 and 703
PSYC 553
PSYC 704 and 6 hours of specialization courses from
PSYC 508, 513, 565, and 669
Electives: no more than 6 hours of department-approved electives from outside the department
Practicum or Thesis: 6 hours, thesis only with permission of chair (optional)

Master of Arts in Life-Span Development with Specialization in Gerontology

Students must complete the following requirements:
30 semester hours of graduate credit
PSYC 702 and 703
PSYC 553
PSYC 614, 704, and 786
Electives: no more than 6 hours of department-approved electives from outside the department
Practicum or Thesis: 6 hours, thesis only with permission of chair (optional)

Master of Arts in General Psychology

Students must complete the following requirements:
30 semester hours of graduate credit
12 hours of general psychology including PSYC 553 and 9 hours from PSYC 701, 702, 703, 704, and 705
Practicum or Thesis: 6 hours, thesis only with permission of chair (optional)
Electives: Up to 9 hours in graduate courses from other departments with the adviser’s approval.

Psychology, Psy.D.

The goal of the doctoral program is to train students in the principles and applications of psychology. To accomplish this, the program has been developed to provide the student with both a knowledge of the basic content areas in psychology and the practical experience required to apply these principles to problems arising in nonacademic work settings. The program contents are applied experimental and clinical psychology. The applied experimental program with specialization in industrial/organizational and human factors engineering is focused on educating psychologists in the use of psychological knowledge and methods employed in settings such as industry, government, consulting organizations, and research and development organizations. Students develop skills in such areas as human–computer interface design, training, personnel selection, and organizational psychology.

The clinical program focuses on educating clinical psychologists to deal with the unique demands of mental health systems and private practice. A student in the first year of training in the clinical specialization is required to complete a minimum of 30 credits during the calendar year.

Admission Criteria

Space in the program is normally limited to 20 new students per year, of which no more than 10 will be in the clinical specialization and no more than 10 in the applied experimental specialization. No particular set of qualifications can guarantee admission. However, an applicant is expected to meet minimum criteria of a 3.00 undergraduate GPA and a 3.25 GPA in psychology course work.
Admission Requirements

All applicants must provide the Graduate School with the following materials by February 15 to be considered for admission in the fall semester:

1. The documents listed under the general admissions requirements for the Graduate School;
2. A completed Department of Psychology application form to be obtained from the Psychology Department;
3. Three letters of recommendation (these letters should be requested from individuals who have a first-hand knowledge of the applicant's work experience and/or academic capabilities);
4. Two- or three-page typewritten personal statement, describing professional goals, past training history, and reasons for seeking the Psy.D.;
5. GRE scores taken within the past five years;
6. A writing sample (optional). This may be selected from either academic papers, publications, or professional reports.

In addition to fulfilling the admission requirements, applicants in the program are expected to have the following:

For the Psy.D. in Applied Experimental, at least 15 hours in psychology including a statistics course and a laboratory course. A tests and measurements course is recommended.

For the Psy.D. in Clinical Psychology, at least 15 hours in psychology including a statistics course, a laboratory course, and courses in personality and abnormal psychology. Courses in developmental, physiological, and tests and measurements are desirable.

An applicant in the final pool will be required to participate in an interview as part of the admissions process.

Financial Assistance

Financial assistance is available through graduate assistantships; doctoral fellowships; and various forms of grants, loans, or employment. Information and forms for financial aid are sent to applicants when their application is received by the Graduate School. The application deadline for financial aid requests is February 15.

Transfer Credits

Transfer credits will be reviewed by a committee only after acceptance to the Psy.D. program.

Degree Requirements

The program of doctoral training in psychology can be perceived as having four educational components: (1) core courses, (2) upper-level specialty courses, (3) supervised practica, and (4) a dissertation.

Core Courses

The core requirement consists of four proseminars, two quantitative courses, and a course in history and systems. The 12-semester-hour proseminar sequence covers the basic subject matter identified by the American Psychological Association as the sine qua non of doctoral training: biological bases of behavior, social bases of behavior, cognitive-affective bases of behavior, and individual behavior. After successful completion of 30 hours (including core courses), a student is awarded an M.A. in psychology.

Specialty Courses

The 700-, 800-, and 900-level courses are designed to provide doctoral candidates with greater depth of study in specific content areas. These advanced courses focus on the comprehensive study of theoretical, applied, and methodological issues within the different specialty areas.

Practica

Both applied experimental and clinical students are expected to perform at a satisfactory level in all practicum placements. The purpose of these practica is to provide a broad range of experiences in settings related to the students' fields of specialization. For example, individuals in the clinical specialization might take practica in adult assessment, child assessment, individual psychotherapy, and group psychotherapy. An individual in industrial might take practica in survey research, and human factors in applied perception or training program development. One practicum for applied experimental students will be in-house and will culminate in a formal paper.

Dissertation

The dissertation requirement is designed to demonstrate the student's ability to apply psychological principles to practical problems. The dissertation may involve an experimental approach to a basic or an applied problem or may organize and summarize in a scholarly fashion a project done in a practicum or internship placement.

Student Evaluation

A student in the doctoral program is evaluated on the basis of grades, comprehensive examinations, and communication skills. In doctoral courses, A and B are the only acceptable grades. In addition to satisfactory course performance, students in the doctoral program must successfully complete comprehensive examinations after they have completed the core requirements. These exams are administered each year in August and January. A student who successfully completes the comprehensive examinations is admitted to doctoral degree candidacy and is then permitted to begin work on a dissertation. The applied emphasis of this program requires the development of communication skills. Written and oral communication skills will be assessed by faculty continuously throughout the program in the form of papers and reports. Students judged deficient in either communication area will be informed of the deficiency; they may be required to leave the program if the deficiency cannot be remedied.
Psy.D. in Human Factors Engineering

Students must complete 88 hours of graduate credit to include the following requirements:

15 hours of proseminars from PSYC 701, 702, 703, 704, and 705
7 hours of quantitative and methods courses: PSYC 553 and 653
9-12 hours of advanced quantitative and specialized methods including PSYC 637 and 755 and one of the following: PSYC 652, 654 or 756
9-12 hours of theoretical seminars including PSYC 636 and two of the following: PSYC 564, 662, 666, or 668
9-12 hours of applied seminars including PSYC 530 and one of the following: PSYC 634 or 638
12-15 hours of practica and research from PSYC 730 or 897
6-9 hours of interdisciplinary courses taken outside the department from a department-approved list
3 hours of special topics in professional issues: PSYC 892
12 hours of dissertation proposal and dissertation: PSYC 998 and 999 (minimum of 3 hours of 998 and 6 hours of 999)
0-12 hours of electives, 9 of which may be taken outside the department from a department-approved list

Psy.D. in Industrial/Organizational

Students must complete 88 hours of graduate credit to include the following requirements:

15 hours of proseminars from PSYC 701, 702, 703, 704, and 705
7 hours of quantitative and methods courses: PSYC 553 and 653
9-12 hours of advanced quantitative and specialized methods including PSYC 654 and 754 and one of the following: PSYC 541, 633, 637, 652, 755, or 756
9-12 hours of theoretical seminars including PSYC 636 and two of the following: PSYC 533, 632, or 667
9-12 hours of applied seminars including one of PSYC 631 or 638 and one of PSYC 635 or 639.
12-15 hours of practica and research from PSYC 730 or 897
6-9 hours of interdisciplinary courses taken outside the department from a department-approved list
3 hours of special topics in professional issues: PSYC 892
12 hours of dissertation proposal and dissertation: PSYC 998 and 999 (minimum of 3 hours of 998 and 6 hours of 999)
0-12 hours of electives, 9 of which may be taken outside the department from a department-approved list

Psy.D. in Clinical Psychology

Students must complete the following requirements:

12 hours of proseminars: PSYC 701, 702, 703, and 705
7 hours of quantitative and methods courses: PSYC 553 and 650
11 hours of assessment and basic skills: PSYC 810, 811, and 880
12 hours of supervision: PSYC 881
9 hours of Theory and Techniques of Psychotherapy: PSYC 830, 831, and 832
6 hours of Community PSYC: PSYC 840 and 841
6 hours of Psychopathology: PSYC 822 and 823
6 hours of Externship: PSYC 885
6 hours of Professional Seminar: PSYC 890, thesis and electives

Psychology Courses (PSYC)

506 Theories of Personality (3:3:0). Prerequisite PSYC 220. Comparative review of prevalent theories of personality with special emphasis on their fundamental models and their similarities and differences.

508 Theories of Development (3:3:0). Prerequisite PSYC 313 or 211. Major theories of infant and child development including works of Piaget, Freud, Erikson, and Spitz.

513 Infant Development (3:3:0). Prerequisite PSYC 313 or permission of instructor. Examination of current issues, research methods, and clinical evaluation techniques in the field of infant development.

530 Human Factors Engineering (3:3:0). Prerequisite An experimental lab course or permission of instructor. Investigation of complex man-machine interactions found in industry today. Extensive empirical research findings are examined.

533 Seminar in Industrial/Organizational Psychology (3:3:0). Prerequisite PSYC 230 or PSYC 636 or permission of instructor. Rotating topics (e.g., leadership theories and management development, performance appraisal) to be announced in advance. May be repeated for credit.

541 Survey Research (3:3:0). Prerequisite PSYC 300 or SOCI 221 or equivalent. This course is designed to acquaint students with the theory, method, and practice of survey research. The course requires students to complete a survey research project.

548, 549 Practicum in Gerontology (3:0:0), (3:0:0). Prerequisite Completion of two of the required core courses in the gerontology certificate program. Practical experience in a gerontological setting under supervision of a qualified professional. 150 contact hours per three semester hours credits.

553 Quantitative Methods I: Advanced Statistics (4:3:2). Prerequisite A screening test is given on the first evening of the class. This test must be passed to take the course. Topics in introductory psychological statistics from an advanced perspective. Additional topics are included. Lab introduces use of computer packages in data handling and analysis. Required for degree students. Requirement may be satisfied by demonstrating competence on an independent examination.

559 Drugs, Hormones, and Behavior (3:3:0). Prerequisite PSYC 372 or equivalent or permission of instructor. Overview of the chemistry of behavior, including neurotransmitters, mechanisms of action of therapeutic drugs such as antidepressants, actions of hallucinogens and other
Areas of Study

560 Advanced Applied Social Psychology (3:3:0). Prerequisite PSYC 231. Study of major trends in social psychological research with emphasis on the ethical and practical problems posed by human experimentation. Topics include attitude measurement, attitude change, conformity, social perception and small group interaction.

564 Sensory Processes (3:3:0). Prerequisite PSYC 309. Intensive exploration of the neural foundations of sensory experience, with special emphasis on the processing mechanisms at different levels of the various sensory pathways.

565 Cognitive and Perceptual Development (3:3:0). Prerequisite Six hours of developmental psychology or permission of instructor. Experimental study of child development. Topics include biogenetic factors in development, sensory processes, learning, perception, motivation, language, and cognitive development.

581/ENGL 581 Survey of Psycholinguistics (3:3:0). Prerequisite ENGL 391 or PSYC 305 or permission of instructor. Study of the psychological basis of human language acquisition and competence, including research on aphasia, association, autism, second language learning, grammatical transformations and the psychological reality of transformational rules.

592 Special Topics (3:3:0). Prerequisite Permission of instructor. Special topics reflecting interest in specialized areas.

614 The Psychology of Aging 13:3:0. Prerequisite Undergraduate or graduate course in aging. 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.

616 General Psychopathology (3:3:0). Prerequisite PSYC 325. Intensive survey of the current psychiatric nomenclature (DSM-III) of major types of psychopathological disturbances.

617 Child Psychopathology (3:3:0). Prerequisite PSYC 373 or 211 and 325. Intensive survey of major types of psychopathological disturbances of infancy and childhood.


633 Evaluative Research in Psychology (3:3:0). Prerequisite PSYC 300 or permission of instructor. Examination of research techniques that are specifically designed to evaluate the human effectiveness of organizations and mental health programs.

634 Seminar in Human Factors Engineering (3:3:0). Prerequisite PSYC 530 or graduate experimental course in psychology or PSYC 701. Rotating topics (e.g. systems theory, human factors in computer systems, office automation) to be announced in advance. May be repeated for credit.

635 Topics in Organizational Psychology (3:3:0). Prerequisite PSYC 230 or 632, or MGMT 610. Selected topics reflecting interest in a specialized area of organizational psychology, announced in advance. Emphasis on recent experimental research literature related to the selected topic.

636 Survey of Applied Psychology (3:3:0). Prerequisite PSYC 300 or permission of instructor. Intensive survey of the historical and current issues in the major areas of applied (nonclinical) psychology: personnel, social-organizational, human factors/engineer psychology.

637 Techniques in Applied Psychology (3:3:0). Prerequisites PSYC 300 and permission of department. A skills-oriented course in the development and use of job analysis, task analysis, link analysis, performance appraisal, interview, and questionnaire techniques. Emphasis on group/individual projects.

638 Training: Psychological Contributions to Theory, Design, and Evaluation (3:3:0). Prerequisite PSYC 636 or permission of instructor. Focus on the application of learning principles derived from psychological research in the development of training models and techniques of skill acquisition. Discussion of research designs and empirical results appropriate to training evaluation.

639 Organizational Processes (3:3:0). Prerequisite PSYC 230 or PSYC 632. Course trains students at both a theoretical and an experiential level in organizational processes. Includes intrapsychic, interpersonal, intragroup, and intergroup behavior as they exist in the context of organizational settings.

650 Clinical Research Methods (3:3:0). Open only to degree students. Prerequisite PSYC 553 or permission of instructor. Overview and discussion of research design and strategy for the conduct of research on human adjustment processes.

651 Quantitative Analysis of Experiments (3:3:0). Prerequisite PSYC 300. Intermediate statistical techniques and introduction to computer packages. Requirement may be satisfied by demonstrating competence on examination.

652 Quantitative Methods II: Analysis of Variance (3:3:0). Prerequisites PSYC 300 and either 304, 305, or 309. Basic concepts in experimental design, fundamental assumptions in analysis of variance, analysis of variance and covariance designs and multiple comparison tests are also reviewed.
653 Research Methods I: Experimental and Research Design (3:3:0). Open only to degree students. Prerequisite PSYC 553. Overview of the various research designs used in psychology. The use of these designs in applied settings is discussed.

654 Naturalistic Methods in Psychology (3:3:0). Prerequisites PSYC 300 and either 304, 305, or 309. Theory and techniques involved in studying people in their natural environment. Primary emphasis is on quasi-experimental designs and methods of systematic observation.

652 Human Learning and Cognition (3:3:0). Prerequisite PSYC 304 or 305. Literature in verbal learning, transfer, and retention is reviewed with special emphasis on recent research. Topics include paired-associate and serial learning, free recall, organization in memory, concept identification, and psycholinguistics.

656 Perception (3:3:0). Prerequisite PSYC 309. Important issues related to neurophysiological, sensory, and cognitive aspects of perception are surveyed. Topics include the general theories of Gibson, Brunswick, and the Gestaltists, and some specialized models developed in recent years, especially information-processing models.

657 Small Group Behavior (3:3:0). Prerequisite PSYC 231 and 653. Theories, methods and topics relevant to individual behavior in a small group setting. Effects of individual on the group, effects of the group on the individual, and interaction effects among individuals.

658 Seminar in Cognition (3:3:0). Prerequisite PSYC 304, 305, or 309. Discussion of current theories and research on the content of cognition, such as symbols, abstractions and cultural tools; and the nature of human mental processes that enable the acquisition, organization, and use of knowledge, such as attending, remembering and thinking.

659 Social and Personality Development (3:3:0). Prerequisite Six hours of developmental psychology or permission of Instructor. Survey of socialization theory and research relevant to infant social relationships, development of aggressive and altruistic behaviors, sex-role development, moral development, parent and adult influences, social class, and cultural influences.

671 Role and Function of the School Psychologist (3:3:0). Open only to school M.A. students or by permission of instructor. Roles and functions of the school psychologist within the educational environment. Certification and ethical standards of the school psychologist are also considered together with current issues and trends.

678 Topics in School Psychology (1-6:0:0). Open to practicing school psychologists and advanced students in school psychology or by permission of instructor. Selected topics reflecting interest in a specialized area of school psychology. Content varies.

684 Psychological Counseling Techniques (3:3:0). Prerequisite Graduate standing or permission of instructor. Application of various counseling techniques generated by current approaches to counseling. Students will be given experience in techniques used in contemporary practice.

687 Intervention Strategies In Alcohol and Polydrug Dependency (3:3:0). Prerequisites PSYC 616 or equivalent and PSYC 684 or equivalent or permission of instructor. Review of multidisciplinary theory and practice in treatment of the alcohol or polydrug dependent client. Emphasis on coordination of relationship counseling and psychotherapy with interventions derived from corrective education and vocational rehabilitation. Problems of transition from institutional to open community settings.

701 Cognitive and Affective Bases of Behavior (3:3:0). Open only to degree students. A survey of concepts in learning, cognitive, and affective processes, including theories and supporting data and their influences on behavior.

702 Biological Bases of Behavior (3:3:0). Open only to degree students. Survey of physiological bases of behavior, including such topics as neural conduction and role of specific neurotransmitters.

703 Social Bases of Behavior (3:3:0). Open only to degree students. Survey of social influences on behavior, including group processes, person perception, and attitude formation.

704 Life-Span Development (3:3:0). Open only to degree students. Survey of theories and research regarding life-span development and personality formation.

705 Historical and Philosophical Issues in Psychology (3:3:0). Open only to degree students. Important historical and systematic approaches to psychology and their relationship to the philosophy of science, structure of theory and philosophical issues in psychology.

709 (formerly 715) The Measurement of Intelligence (4:3:2). Open only to Psy.D. or M.A. school students. Permission of department required. Prerequisites PSYC 617 or 822 and PSYC 320 or equivalent. Administration, scoring and interpretation of the 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.

710 (formerly 711) Psychological Assessment (4:3:2). Open only to Psy.D. or M.A. school students. Prerequisite or corequisite PSYC 709 (formerly 715) or 822 or PSYC 810 and permission of department. Study of major instruments used in clinical assessment; their nature, problems and predictive value; administration and scoring of the major techniques for evaluation of personality and organicity; principles of interpretation of these procedures.
722 Advanced Child Assessment (4:3:2). Open only to Psy.D. or M.A. school students. Prerequisites PSYC 709 (formerly 715) and 710 (formerly 711) or PSYC 810 and 811 and five intellectual assessments at the Psychological Clinic. Permission of department required. Problems involved in diagnostic assessment of children with various handicapping conditions such as brain dysfunction, learning disabilities, retardation, and emotional disturbances.

730 Practicum in Applied Psychology (1-6:0:0). Open only to degree students in Psychology and permission of department required. Apply in writing to the area coordinator 60 days prior to the beginning of the semester. Practical experience in an organizational setting as assigned. Psy.D. students may repeat this course to a maximum of 15 hours; M.A. students to a maximum of six hours. Course is graded S, NC.

740 Seminar in Psychosocial Issues (3:3:0). Prerequisite Permission of instructor. Intensive examination of selected aspects of the law—psychology interface. Focus on how psychology contributes to the legal process and how law affects the application of psychology. Students select issues relevant to their career goals, search the literature and present their findings to the class.

750 Psychological Practicum (1-6:0:0). Open only to M.A. school students. Prerequisite assessment courses: PSYC 709 (formerly 715), 710 (formerly 711), and 722; and testing experience in the Psychological Clinic. Apply (in writing) for permission of department 60 days prior to the beginning of the semester. Practical experience in a school setting as assigned.

754 Quantitative Methods III: Psychological Applications of Regression Techniques (3:3:0). Prerequisite PSYC 553. Psychological applications of regression techniques will be reviewed in a variety of contexts including experimental, field, and survey settings.

755 Statistical Packages for Psychology (3:3:0). Prerequisite PSYC 553, 652 or 653, or equivalent. Introduction to manipulation techniques of statistical analysis appropriate for applied problems in psychology with three widely used statistical packages—BMD, SPSS and SOUPAC.

756 Quantitative Methods IV: Multivariate Techniques in Psychology (3:3:0). Prerequisite PSYC 553 or equivalent; PSYC 755 recommended. Survey of multivariate statistical techniques as applied to psychological research. Emphasizing analysis of complex designs and interpretation of multivariate data analyses resulting from computer processing.

757 School Psychology Internship (3, 6, 9, 12:0:0). Prerequisites Completion of required courses in school psychology and permission of program coordinator. One-school-year supervised field experience where the advanced school psychology student functions as a full-time staff member within a school system. Student completes a paper on a practical research project which involves an alternative school psychology role in the school system. Enrollment is for a total of 9 hours (thesis option) or 12 hours (nonthesis option) in increments of 3 hours according to placement. Students enrolled in PSYC 799 are not required to complete the practical research project.

772 Seminar in Behavioral Assessment of Toxic Effects (3:3:0). Prerequisite Graduate course in physiological psychology or animal behavior, and a course in drugs and behavior or environmental hazards, or permission of instructor. Intensive introduction to methodology of behavioral assessment of adverse drug or chemical effects. In-depth discussion of major research in behavioral toxicology, such as the effects of heavy metals, inhalants, gases, and abused drugs on behavior.

786 Assessment and Treatment in Gerontology (3:3:0). Prerequisites Course in the psychology of aging, PSYC 320 and PSYC 423, or equivalent courses. Functional assessment of older adults including the conceptual and methodological problems involved. Intervention strategies for older adults are examined, including interviewing, group work with older persons, milieu therapy, reality therapy, and the design of supportive environments.

791 School Psychology Practicum (3:3:0). Prerequisites PSYC 709, 710, 722, 750, and permission of department. Fieldwork with a practicing school psychologist in a school system two days a week. Introduces student to observation, assessment, and consultation within a school system. This pre-internship experience is supervised by University faculty and is a prelude to an internship with the same school system the following academic year.

798 Practical Research in School Psychology (4:0:0). Prerequisites Required courses in school psychology program and permission of program coordinator. Practical project in the school system under the supervision of a faculty member. The student completes a paper on a project and has it approved by adviser and at least one other faculty member. Not available to students enrolled in EDUC 599 or PSYC 799.

799 Thesis (3-6:0:0). Research and approved thesis topic under the direction of a thesis committee with approval of the chair.

800 Studies for the Doctor of Arts in Education (variable credit). Prerequisite D.A.Ed. admission to study in psychology. Program of studies designed by student’s discipline director and approved by student’s doctoral committee, which brings the student to participate in the research of the discipline director and results in a paper reporting the original contributions of the student. The paper is presented in a subsequent D.A.Ed. summer seminar. Enrollments may be repeated.

810 Intellectual Assessment (4:3:2). Open only to Psy.D. students. Course covers administration, scoring, and interpretation of individual adult and child assessment procedures. Problems of assessment and theories of intelligence are reviewed.
811 Personality Assessment (4:3:2). Open only to Psy.D. students. Prerequisite PSYC 810. Course covers administration, scoring, and interpretation of adult and child projective and objective tests of personality functioning.

812 Advanced Assessment (4:3:2). Open only to Psy.D. students. Prerequisites PSYC 810 and PSYC 811. Course covers the interpretation and integration of multiple test findings for purposes of differential diagnosis of mental disorders.


822, 823 (formerly 723) Seminar in Experimental Psychopathology I, II (3:3:0), (3:3:0). Open only to Psy.D. students. A seminar that provides an intensive integration of the psychopathology literature with mastery of the current psychiatric nosology.

830 (formerly 775) Theories of Psychotherapy (3:3:0). Open only to Psy.D. students. Prerequisites 822 and 823. Review of the major approaches to psychotherapy, including the psychoanalytic, humanistic–existential, and cognitive–behavioral approaches. Students study individual, group, and family therapy from each of these perspectives.

831 (formerly 729) Behavior Therapy (3:3:0). Open only to Psy.D. students. Investigation of specific procedures for altering emotional distress and behavioral dysfunction as they are implemented within the conceptual framework of clinical psychology.

832 (formerly 727) Group and Family Psychotherapy (3:3:0). Prerequisites Open only to Psy.D. students. PSYC 822, 823 (formerly 723), and 830 (formerly 755). Review of major approaches to group and family psychotherapy. Group therapy approaches include the psychoanalytic approaches of Slavson and Ezriel, Yalom’s interactionist approach, and Bion’s Tavistock model and the encounter approaches of Schultz and Perls. Family therapy approaches include Bowen’s systems approach, the communication models of Haley and Satir, Minuchin’s structural theory, and Ackerman’s psychoanalytic approach.

840, 841 (formerly 731, 732) Community Psychology: Theory and Practice (3:3:0) (3:3:0). Open only to Psy.D. students. Introduction to the history, concepts, and practice of community psychology. Course work and practical focus on community mental health theory, consultation, prevention, program planning and evaluation and human service management.

880 (formerly 618) Clinical Foundations (3:3:0). Open only to Psy.D. students. Focus on basic clinical/interactional skills, including basic therapy skills, psychodiagnostic interviewing, mental status exam, and interview management skills. Includes exposure to a variety of clinical settings and clients.

881 (formerly 793) Assessment and Psychotherapy Supervision (3:0:0). Prerequisites Open only to Psy.D. students and permission of clinical director. The course entails the administration, scoring, and interpretation of psychological tests for adults and children in a professional setting under supervision. Must be repeated three times for 12 hours of credit and may be repeated for up to 18 hours of credit.

885 (formerly 795) Clinical Externship (3:3:0). Open only to Psy.D. students in the third year of training. Students are placed in a local mental health facility, where they will have the opportunity to develop their psychodiagnostic and psychotherapy skills under the supervision of a clinical psychologist. Presentation of clinical material at department seminars is also required. May be repeated for credit.

890 (formerly 790) Seminar in Professional Psychology (1:1:0). Open only to Psy.D. students. Clinical students are required to enroll for each semester they are in the program. Focuses on the role of psychologists in various work settings. Consideration given to the functions performed by psychologists in those settings; to contributions by psychologists to the overall goals of those settings; to relationships with other professionals, managers, and personnel; and to management and policy issues arising in the various settings. Ethical issues addressed. Course is graded S, NC. May be repeated for credit.

892 (formerly 792) Special Topics in Psychology (3:3:0). Open only to Psy.D. students. Selected topics reflecting specialized areas in psychology. Content varies. May be repeated.

897 (formerly 797) Directed Reading and Research (1-3:0:0). Independent reading on a topic agreed to by a student and a faculty member. May be repeated once, except it may not be repeated for degree credit by students who also register for PSYC 799. (Clinical Psy.D. students may not take this for elective credit.)

998 Doctoral Dissertation Proposal (variable credit). Work on a research proposal which forms the basis for a doctoral dissertation. May be repeated. No more than 24 credit hours of PSYC 998 and 999 may be applied to doctoral degree requirements.

999 Doctoral Dissertation (variable credit). Research on an approved dissertation topic under the direction of dissertation committee. May be repeated. No more than 24 credit hours of PSYC 998 and 999 may be applied to doctoral degree requirements.
Public Administration

Faculty

Alexander, Lenora, Ph.D., State University of New York, Buffalo, 1974; Visiting Commonwealth Professor of Public Affairs

Anderson, Wayne F., M.S., University of Wisconsin, Madison, 1949; Distinguished Professor

Brown, Brack, Ph.D., Syracuse University, 1977; Associate Professor

Clark, Robert P., Ph.D., Johns Hopkins University, 1966; Professor

Cole, John D. R., M.A., University of Redlands, 1951; M.P.A., University of Southern California, 1983; Research Professor

Dawisha, Adeed, Ph.D., London School of Economics, 1974; Professor of Government and Politics

Fisher, Joseph L., Ph.D., Harvard University, 1947; Visiting Distinguished Professor

Friedlander, Melvin A., Ph.D., The American University, 1982; Assistant Professor

Gortner, Harold F., Ph.D., Indiana University, 1971; Associate Professor (Department Chair)

Hart-Nibbrig, Nand E., Ph.D., University of California, Berkeley, 1974; Visiting Commonwealth Professor

Heclo, Hugh, Ph.D., Yale University, 1970; Robinson Professor

Knight, Barbara B., Ph.D., The George Washington University, 1971; Associate Professor

Mahler, Julianne G., Ph.D., State University of New York at Buffalo, 1976; Associate Professor

Nguyen, Hung M., Ph.D., University of Virginia, 1965; Associate Professor

Ostrowski, John W., Ph.D., Kent State University, 1980; Assistant Professor

Paden, John, Ph.D., Harvard University, 1968; Robinson Professor

Pffiffner, James P., Ph.D., University of Wisconsin, Madison, 1975; Associate Professor

Plant, Jeremy F., Ph.D., University of Virginia, 1975; Associate Professor (Director, Doctoral Program in Public Administration)

Rubenstein, Richard E., J.D., Harvard Law School, 1963; Professor

Sacco, John F., Ph.D., Pennsylvania State University, 1973; Associate Professor


courses are taught by a distinguished full-time faculty, part-time instructors who hold advanced degrees and positions of responsibility in the public sector teach some classes. Thus, a good balance between theory and practice is maintained, which is valuable to everyone in the M.P.A. program.

Admission Requirements

In addition to fulfilling the entrance requirements of the Graduate School, applicants must submit:

1. A grade point average of at least 3.00 on a 4.00 scale the last 60 hours of undergraduate work or the major field of study;

2. Three letters of recommendation (letters should assess the applicant's academic and career potentials);

3. A resume detailing work and civic activities undertaken if the applicant is employed;

4. Training certificates or other work-related or postbaccalaureate training information (no credit need be given for this experience, but the information will be used in helping to plan the student's education program);

5. GRE General Test scores (not required of persons who have completed another graduate degree, e.g., master's, J.D.). GMAT or LSAT scores may be substituted for the GRE.

Degree Requirements

The M.P.A. program requires 42 semester hours of graduate course work. In addition, a student must demonstrate proficiency in statistics by completing an appropriate course or by satisfying the M.P.A. faculty that his or her work experience clearly demonstrates proficiency. The structure of the program is based on four levels of course work:

- core courses (24 hours), distributive requirements
(9 hours), issues seminar (3 hours), and elective courses (6 hours). Four concentrations—public management, policy analysis, public financial management, and public personnel management—predominate in the program, but others may be tailored to meet the needs of students with special interests. A concentration in international management became available in 1985-86.

Courses Outside the Public Administration Program

Courses from another graduate program of this University may be allowed, provided they are from a related field and prior approval is received from the faculty adviser and director of the public administration program.

With the approval of the student’s adviser, the chair of the Department of Public Affairs, and the dean of the Graduate School, graduate credits earned at other accredited colleges or universities may be accepted for transfer. Normally, six hours of graduate credit may be transferred at the time of admission. With prior approval, an additional six hours may be earned at other institutions while enrolled in the program. In a few cases, equivalency credit (six credits maximum) may be granted for training received outside of an academic setting if it can be proved that the training is equal in quality to graduate course work. A maximum of 12 semester hours from all sources (including extended studies) will be accepted.

M.P.A.—Management and Analysis Track

All students are required to take eight M.P.A. core courses that provide a common body of knowledge about public administration, its political environment, and the special tools required in its study and practice. These courses are:

- PUAD 502 Theory and Practice of Public Administration
- PUAD 610 Computer Uses In Managing Public Organizations
- PUAD 611 Methods of Analysis for Public Managers I
- PUAD 612 Methods of Analysis for Public Managers II
- PUAD 615 Administrative Law
- PUAD 620 Organization Theory and Management Behavior
- PUAD 640 Public Policy Process
- PUAD 700 Ethical Dimensions of Public Administration

Each student is expected to complete an education plan, with the help of his or her adviser, after completing the first 12 hours of the M.P.A. course work. This plan may be revised as needed, but it must be completed prior to enrollment for further courses. The education plan covers the courses to be taken in addition to completing the core courses, and includes three courses chosen from the following list, one issues seminar, and two electives.

Choose three courses from:

- PUAD 621 Principles and Practices in Government Organization and Management
- PUAD 622 Program Planning and Implementation

Choose one issues seminar:

- PUAD 641 Policy Analysis
- PUAD 642 Program Evaluation
- PUAD 650 Intergovernmental Relations in the United States
- PUAD 660 Public Financial Management
- PUAD 661 Public Budgeting Systems
- PUAD 662 State and Local Financial Management
- PUAD 670 Personnel Administration in the Public Sector
- PUAD 671 Public Employee Labor Relations
- PUAD 572 Methods in Public Personnel Administration

Choose one concentration:

- PUAD 729 Issues in Public Management
- PUAD 749 Issues in Public Policy Analysis

The two elective courses are to be chosen, with the help of an adviser, building upon the student’s concentration whenever possible and looking outside the public administration program when appropriate courses are available. A thesis option is available and encouraged as one way of fulfilling the last six hours of the program. An internship is encouraged for preprofessional students.

M.P.A.—International Management Track

The International Management Track in the M.P.A. is designed to serve those individuals who are working for, or wish to work for, government agencies, third-sector organizations, or businesses that are active in the international arena. The program requires 42 hours distributed in the following manner:

Core Courses

- PUAD 502 Theory and Development of Public Administration
- GOVT 504 Theory and Practice of International Relations
- PUAD 611 Methods of Analysis for Public Managers I
- PUAD 612 Methods of Analysis for Public Managers II
- PUAD 701 Cross-Cultural and Ethical Dimensions of International Management

Distributive Core Courses

- PUAD 620 Organization Theory and Management Behavior
- PUAD 641 Policy Analysis
- PUAD 660 Public Financial Management
- PUAD 670 Personnel Administration in the Public Sector

Concentration

Concentrations are composed of seven courses chosen with the advice of the student’s faculty adviser. The courses should be selected to support each candidate’s chosen emphasis within the general area of international management. They should include both substantive courses and courses developing analytical and practical skills, and focus on one of the following three fields:

1. Development Administration
2. Management of International Organizations

http://catalog.gmu.edu
3. Management of National Security
The concentration program must include at least two additional courses from within the international relations and public administration graduate curricula.

Courses
GOVT 504 Theory and Practice of International Relations
GOVT 631 The Dynamics of Development
PUAD 632 Managing Development Programs and Projects
PUAD 633 Management of International Organizations
PUAD 634 Management of National Security
PUAD 701 Cross-Cultural and Ethical Dimensions of International Management
PUAD 739 Issues in International Management

Doctor of Public Administration, D.P.A.
The goal of the Doctor of Public Administration degree is the education of individuals who intend to devote their life's work to the study and practice of public affairs. Doctoral education in public administration is characterized by inquiry into basic issues of public policy and management that confront the field today and are likely to emerge in the future. Its purpose is to develop leaders who understand the intellectual traditions of their culture and who have the moral and intellectual capacity and resiliency to understand, analyze, and influence public affairs. To reach these goals, the program stresses the development of conceptual and analytical capacities; an understanding of administrative institutions and behavior in a wide variety of social and cultural settings; an appreciation of the basic ethical and substantive questions faced by society; the discernment of future challenges to public administration knowledge and action; the enhancement of administrative and managerial competency; and the development of opportunities for ongoing personal and professional development.

Admission Requirements
While the requirements are stated generally, an applicant should be aware that the class size each year is limited to 20 participants. Therefore, only individuals with outstanding records and potential will be chosen. Admission to the D.P.A. program depends on the following criteria:

1. An applicant's previous academic record should demonstrate high intellectual capacity, indicating to the graduate public administration faculty that the applicant is capable of completing the doctoral degree.
2. An applicant must have an M.P.A., M.B.A., M.S., M.A., J.D., or equivalent postbaccalaureate work at the time of entry into the D.P.A. class.
3. An applicant to the D.P.A. who does not have a master's degree or equivalent postbaccalaureate work may apply, but should have outstanding credentials to justify direct entry into the D.P.A. programs. Students who have completed 30 hours toward the M.P.A. are considered along with all other applicants. If accepted into the D.P.A. program, participants are awarded the M.P.A. upon completion of the core seminar (PUAD 801-802).

Application For Admission
In addition to fulfilling the general admission requirements of the Graduate School, applicants must submit:

1. Scores from the GRE General Test, GMAT, or LSAT;
2. Three letters of reference;
3. A detailed resume (not the SF171) including information on all work, civic activities, and interests;
4. An essay of 1,500 to 2,000 words that describes how the applicant believes the D.P.A. program at GMU can help achieve stated intellectual and professional objectives.

Applications, including all supporting materials, must be received by the Graduate Admissions office no later than April 1 to be considered for the annual D.P.A. class to be admitted for the following fall semester, or November 1 for the spring.

Degree Requirements
The D.P.A. program requires 90 semester hours of work beyond the baccalaureate degree. A participant must show proficiency in two analytic managerial tools before being advanced to candidacy. Although all participants admitted to the D.P.A. program must have the equivalent of a master's degree, they must take at least 36 hours of course work (the core seminars, intensive seminars, and work spelled out in their individual education plans) and pass two comprehensive examinations before being advanced to candidacy. A dissertation is required, and it must be defended in an oral examination. These and other requirements for the D.P.A. degree are described below.

Residency
A participant in the D.P.A. program must establish academic residency at GMU before being advanced to candidacy. Residency is established by:

1. Participating in the introductory seminar held prior to the fall semester;
2. Completing the core curriculum, two six-hour seminars taken consecutively during the first two semesters of the D.P.A. program;
3. Passing the core comprehensive examination given after the completion of the core curriculum.

Analytical Managerial Tools Proficiency
To satisfy the analytic and managerial tools component of the D.P.A. degree, two sets of requirements must be met. First, a participant must demonstrate a working knowledge of the principal research and management tools applicable to public administration. This includes
1. Successfully completing a graduate course and an intensive seminar in the logic of research;
2. Showing knowledge of basic statistical methods (descriptive statistics, probability, sampling, hypothesis testing, and correlation-regression);
3. Showing knowledge of advanced analytical methods (microeconomics, decision analysis, systems theory, and modeling), which may be done by taking PUAD 612 or by passing the course's final exam.

Second, a participant must demonstrate competence in those research and management methods related to the dissertation topic by successfully defending the dissertation proposal.

Curriculum Requirements
A participant in the D.P.A. program should normally complete the core seminars during the first full year of study. After completing the core seminars and the core comprehensive examination, a D.P.A. participant focuses on an individual special area of study designed in consultation with an adviser and the D.P.A. director. Courses are chosen from graduate courses in the 600, 700, and 800 series. Courses used as core courses for the M.P.A. (502, 503, 610, 611, 615, 700) may not be used for the D.P.A.

A D.P.A. participant is required to take the core seminar sequence 800–801–802 and the research logic sequence 612–603–804. Additional courses are selected to represent the objectives of the individual as outlined in the educational plan. A typical program would include seminars in at least two of the activity areas of analysis and evaluation; leadership and change and innovation; a tutorial in the activity area that forms the special area of study; and additional advanced course work relevant to the education plan.

The planning matrix serves as a guide for understanding the options open to participants in the program. Seminars and tutorials are offered the activity areas and in the perspective of organizations. Each participant is expected to show a mastery of one activity area and one perspective in the special area of study comprehensive examination, and a general understanding of the field of public administration.

The educational plan prepared by each participant is the guide to the special area of study. Using the matrix as the focus, the individual prepares an initial draft of the education plan in the first year of study. The plan for the special area of study is periodically updated as the participant proceeds through the program. This plan must be worked out jointly between the participants and their advisers and the advisory committees. The plan is reviewable by the graduate public administration faculty, which retains ultimate authority in such matters.

Each plan identifies a particular focus and an activity area and perspective from the matrix. For example, a special area of study called health policy might focus on the activity area of analysis and evaluation and the perspective of society. A special area focusing on federal executive development would examine leadership and the individual perspective. The goal of the program is to provide structure through the matrix and individualized learning opportunities through the education plan and the special area of study.

Model for Special Areas of Study Portion of D.P.A. Program at George Mason University

<table>
<thead>
<tr>
<th>Perspectives</th>
<th>Analysis and Evaluation</th>
<th>Leadership</th>
<th>Change and innovation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individual Perspective</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organizational and inter-organizational Perspective</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Societal and Environmental Perspective</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Work at other universities must be approved by the dean of the Graduate School on the recommendation of the director of the public administration program. No more than six hours of work from other universities taken subsequent to the D.P.A. core seminars may normally be counted toward the degree.

Doctoral Examinations
A participant in the D.P.A. program must complete the following three doctoral examinations:
1. Core comprehensive examination. Upon completion of the two core seminars, a participant must pass a written comprehensive examination covering the material included in the core of the program.
2. Special area of study comprehensive examination. Upon completion of the special area of study, the participant must complete a written examination as the final step in advancing to candidacy.
3. Oral defense of dissertation. A candidate must defend his or her research in a presentation to the graduate faculty.

Advancement To Candidacy
A participant is advanced to candidacy for the D.P.A. after establishing proficiency in the analytic and managerial tools, completing the required course work as specified in the core and intensive seminars and in the plan for the special area of study, and passing the two comprehensive examinations. In addition, a formal plan of study must be approved and filed with the graduate school.
Dissertation

Each doctoral candidate must present a dissertation on a subject connected with the special area of study. The dissertation must represent technical mastery of the subject, originality in research, independent thinking, and scholarly ability. Its conclusions must be logical, its literary form must be acceptable, and its contribution to knowledge must be recognizable to others in the field.

Government and Politics Courses (GOVT)

504 Theory and Practice of International Relations (3:3:0). Prerequisite Acceptance in M.P.A. or permission of department. Theoretical and empirical examination of the international system which both affects, and is affected by, the decisions, behaviors, and subsystems of state and nonstate (organizational) actors.

537 Selected Problems of Third World Development (3:3:0). Prerequisite Graduate standing or permission of department. Third World development problems, including development management, a new international economic order, foreign aid, multinational corporations and international organizations. May be repeated with permission of department.

631 The Dynamics of Development (3:3:0). Prerequisite Graduate standing or permission of department. Internal and external factors and forces that affect the political development of Third World countries, including North-South relations, dependence theory, and development strategy within the context of resource scarcity.

Public Affairs Course (PUAF)

850 Studies for the Doctor of Arts in Education (variable credit). Prerequisite D.A.Ed. admission to study in public affairs. Program of studies designed by student's discipline director and approved by student's doctoral committee, which allows the student to participate in the research of the discipline director and results in a paper reporting the original contributions of the student. The paper is presented in a subsequent D.A.Ed. summer seminar. Enrollments may be repeated.

Public Administration Courses (PUAD)

502 Theory and Practice of Public Administration (3:3:0). Prerequisite Graduate standing or permission of department. Survey and review of the field of public administration to include development of U.S. governmental administration, theories of administrative organization and behavior, administrative processes, management of people and money, administrative responsibility, and the public policy-making/public policy-implementation nexus.

503 The Political Environment of Public Management (3:3:0). Prerequisite Graduate standing or permission of department. Skills involved in a public manager's interaction with private groups, legislative bodies, advisory committees, the press, other administrative agencies, political executives and other levels of government. Case studies of administrative participation in the political process of public policy making.

610 Computer Uses In Managing Public Organizations (3:3:0). Prerequisite Admission to graduate school or permission of instructor. Examines how managerial and analytical functions in public organizations can be performed via end-user computer applications. Provides in-depth coverage of selected data base and decision support packages. Gives attention to logic and integration of application software.

611 Methods of Analysis for Public Managers I (3:3:0). Prerequisite Statistics proficiency. Techniques and skills available to, and used by, public managers to solve policy-related problems or to analyze policy-related data. Focus on problem definition, research design, and problem solving under conditions of uncertainty in the public sector.

612 Methods of Analysis for Public Managers II (3:3:0). Prerequisite PUAD 611. Techniques and skills available to, and used by, public managers to solve policy-related problems or to analyze policy-related data. Focus on data gathering and analysis, use of computers, systems theory and analysis, and operations research.


620 Organization Theory and Management Behavior (3:3:0). Consideration of behavior within the context of public organization and the consequent changes required in management. Focus on such issues as perception, attitude formation, motivation, leadership, systems theory, communication and information flow, conflict theory, and decision theory.


622 Program Planning and Implementation (3:3:0). Prerequisite PUAD 620. Practical exploration of operationalizing public legislation in the American federal system. Construction of organizational apparatus, development of operational plans, and systems of control and evaluation necessary to implement government programs. Emphasis on coordination of tasks and resources required for effective program implementation.
632 Managing Development Projects and Programs (3:3:0). Prerequisite PUAD 502. Design, implementation, and evaluation of development projects and programs, with emphasis on management and organizational strategies and processes to accomplish development goals. Particular attention to socioeconomic-political environments and organizations' structures and routines in the Third World context.

633 Management of International Organizations (3:3:0). Prerequisites PUAD 502 and PUAD 504. Structure of decision making within international organizations; their internal structures, behavior of individuals and groups working within these organizations, and impact of external pressures on their management. Emphasis on factors and procedures that promote or hinder effectiveness of international organizations.


640 Public Policy Process (3:3:0). Processes of making public policy, including detection of public issues, consideration of alternatives, and adoption and implementation of solutions. Highlights the major actors in the policy process, as well as the environment within which they work.

641 Policy Analysis (3:3:0). Prerequisite PUAD 611. Substantive issues in the conceptualization and practical applications of policy science and other formal perspectives to policy articulation, program formulation and program evaluation in the public sector.

642 Program Evaluation (3:3:0). Prerequisite PUAD 611. Practical exploration of assessment techniques utilized by central analytical units in government, including program impact and program strategy evaluations, cost analysis, field experiments, productivity studies and evaluation research.

650 Intergovernmental Relations in the United States (3:3:0). In-depth study of intergovernmental relations, with emphasis on contemporary patterns of fiscal relations and operational grant programs.

651 Administration in the Commonwealth of Virginia (3:3:0). Cultural, demographic, constitutional, and socioeconomic environment of public administration in Virginia. Governmental agencies, legislative functions, executive leadership, staff agencies, state-local relationships, intrastate regionalism and administrative customs peculiar to Virginia.

660 Public Financial Management (3:3:0). Analysis of revenue forecasting, revenue strategy, impact of inflation, interest rates, taxation, accounting, budgeting, "back door" spending, pension funding, user charges and other aspects of governmental finance.


662 State and Local Financial Management (3:3:0). Prerequisite PUAD 660 or permission of department. Systems of public finance at state level. Impact of budgetary systems and taxation on state government, impact of federal grants-in-aid, revenue sources, and the relationship of national, state and local jurisdictions as partners in a federal system. Program auditing and new budgetary techniques are examined for their applicability at the state level.


671 Public Employee Labor Relations (3:3:0). Prerequisite PUAD 670 or permission of department. Public employee labor relations, including unionization, representational elections, bilateral policy negotiations, administration of agreements, management rights, union and membership security, the strike issue and grievance procedures, impact on public administration, and assessment of future developments.

672 Methods in Public Personnel Management (3:3:0). Prerequisite PUAD 670. Introduction to some of the more important basic methods used in public personnel management and administration, including workforce planning and analysis; job evaluation and compensation; examining and selection; workforce management; and training and development.

700 Ethical Dimensions of Public Administration (3:3:0). Prerequisite Final semester of a student's M.P.A. program. 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.

701 Cross-Cultural and Ethical Dimensions of International Management (3:3:0). Prerequisite PUAD 504. Examination of normative issues in management of programs in international context. Emphasis on interplay of cultural, sociopolitical, legal, and ethical factors and on management and policy problems arising from conflicting goals, values, and inequities among nations and regions.

### Areas of Study

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Prerequisites</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>739</td>
<td>Issues in International Management</td>
<td>3:3:0</td>
<td>-</td>
<td>Examination of significant current issues in public international management. Emphasis on practical applications of theories and analysis of problems in the public international management arena. Competence in improving management practices in international management settings.</td>
</tr>
<tr>
<td>749</td>
<td>Issues in Public Policy</td>
<td>3:3:0</td>
<td>Prerequisite PUAD 641</td>
<td>Examination of significant current issues in public policy in contemporary American government. Emphasis on practical applications of theories and analysis to policy problems. Competence in improving policy analysis in selected government settings.</td>
</tr>
<tr>
<td>759</td>
<td>Issues in Local Government Administration</td>
<td>3:3:0</td>
<td>-</td>
<td>Contemporary problems—such as land use, transportation, economic development, growth management, and environmental impact—in the management of counties, cities, towns, and special districts. Credit is determined by the department.</td>
</tr>
<tr>
<td>784</td>
<td>Internship</td>
<td>2–3:0:0</td>
<td>Prerequisite Open to authorized graduate majors only, contact the department one semester prior to enrollment. Internships are work-study programs with specific employers. Credit is determined by the department.</td>
<td></td>
</tr>
<tr>
<td>795</td>
<td>Research Design</td>
<td>3:0:0</td>
<td>Prerequisite PUAD 612 and at least 12 hours of approved graduate credit and completion of proficiency tools. Review of project-related background material. The research design must include a statement of purpose, identification of data sources, data collection strategies, possible alternate hypotheses to be tested, the framework of analysis and a statement of anticipated results.</td>
<td></td>
</tr>
<tr>
<td>796</td>
<td>Directed Readings and Research</td>
<td>3:0:0</td>
<td>Prerequisites Permission of department and instructor. Reading and research on a specific topic under the direction of a faculty member. Written report required; oral examination over the research and report may be required. May be repeated once.</td>
<td></td>
</tr>
<tr>
<td>798</td>
<td>Research Project</td>
<td>3:0:0</td>
<td>Prerequisites PUAD 795 and permission of department. Completion of an original research project related to public sector administration. On the basis of the approved research design each student prepares and defends a final report that is the result of the research project. Final report must be approved by the Department of Public Affairs.</td>
<td></td>
</tr>
<tr>
<td>800</td>
<td>Introductory Doctoral Program Seminar</td>
<td>2:2:0</td>
<td>Prerequisite Permission of department accepted in DPA program. Intensive orientation, self-appraisal and planning seminar for individuals entering the DPA program.</td>
<td></td>
</tr>
<tr>
<td>803</td>
<td>Doctoral Seminar in Issues in Public Administration</td>
<td>1–2:0:0</td>
<td>Prerequisite PUAD 800.</td>
<td>MAJOR PROGRAMMATIC, FUNCTIONAL, OR OPERATIONAL ASPECTS OF PUBLIC ADMINISTRATION, AND THE PRINCIPAL HISTORICAL, CURRENT, AND PROSPECTIVE ISSUES OF CONCERN TO THE FIELD. LEARNING DESIGN ENTAILS FORMATION OF SMALL TEAMS FOR FACT-FINDING, ANALYSIS, AND PRESENTATION ON IMPORTANT ISSUE AREAS, AS WELL AS FULL-GROUP SESSIONS. THE INTENSIVE FORMAT SCHEDULE IS FOLLOWED. MAY BE REPEATED.</td>
</tr>
<tr>
<td>804</td>
<td>Conduct of Social Inquiry</td>
<td>3:3:0</td>
<td>Prerequisite PUAD 800.</td>
<td>EMPHASIZES THE ASSUMPTIONS AND LOGIC OF DIFFERENT RESEARCH DESIGNS AND DATA COLLECTION TECHNIQUES AND RESEARCH AS AN EXERCISE IN THEORY BUILDING. DESIGNED TO ENABLE CANDIDATES TO DO ORIGINAL RESEARCH AND TO CRITIQUE THE RESEARCH OF OTHERS.</td>
</tr>
<tr>
<td>810</td>
<td>Doctoral Seminar in Change, Innovation and Public Administration</td>
<td>3:3:0</td>
<td>Prerequisites Permission of instructor and adviser; doctoral students from other programs may enroll only by permission of instructor.</td>
<td>EMERGING AND TRADITIONAL LANDMARKS IN INNOVATION AND PUBLIC ADMINISTRATION—HISTORICAL, CURRENT, AND PROSPECTIVE. IMPORTANCE OF THEORIES, CONCEPTS, AND METHODOLOGIES FOR GENERATING AND EVALUATING INNOVATIONS AND POLICIES. DETERMINATION AND IMPLEMENTATION OF INNOVATIVE PRACTICES. CRITICAL ANALYSIS OF THE ORGANIZATIONAL, POLICY, AND OPERATIONAL ENVIRONMENTS FOR INNOVATION. FOCUS ON THE NATURE OF LEADERSHIP AND THE SKILLS AND TECHNIQUES RELEVANT TO THE FIELD. LEARNING DESIGN INCLUSIVELY ENABLES CANDIDATES TO ENGAGE IN THEORETICAL DISCUSSION AND PRACTICAL ACTIVITY IN ORGANIZATIONAL change, innovation, and creativity in society with the object of enhancing student sensitivity to and knowledge about the future. WAYS FOR DESIGNING THE STRUCTURES AND PROCEDURES OF PUBLIC ORGANIZATIONS SO THEY CAN ADAPT TO CHANGE.</td>
</tr>
<tr>
<td>819</td>
<td>Doctoral Tutorial in Change, Innovation, and Public Administration</td>
<td>1–3:0:0</td>
<td>Prerequisites Permission of instructor and adviser; doctoral students from other programs may enroll only by permission of instructor.</td>
<td>INDIVIDUALIZED, INTENSIVE STUDY OF PARTICULAR FEATURES OF CHANGE, INNOVATION, AND PUBLIC ADMINISTRATION. STUDY ARRANGED AND SUPERVISED WITH TUTORIAL PROFESSOR.</td>
</tr>
<tr>
<td>820</td>
<td>Doctoral Seminar in Leadership</td>
<td>3:3:0</td>
<td>Prerequisites Permission of instructor and adviser; doctoral students from other programs may enroll only by permission of instructor.</td>
<td>LEADERSHIP IN THE POLITICAL AND ADMINISTRATIVE WORLD, WITH SPECIAL EMPHASIS ON THE LEADER'S SOCIAL INFLUENCE, INTELLECTUAL GUIDANCE, AND ROLE IN POLICY MAKING AND ORGANIZATIONAL CREATION AND DIRECTION. INQUIRY IS ALSO MADE INTO THE EFFECT OF INTERNAL AND EXTERNAL FORCES UPON LEADERSHIP STYLES AND EFFECTIVENESS.</td>
</tr>
<tr>
<td>821</td>
<td>Doctoral Seminar in Theories of Organization and Bureaucracy</td>
<td>3:3:0</td>
<td>Prerequisites Permission of instructor and adviser; doctoral students from other programs may enroll only by permission of instructor.</td>
<td>EXAMINATION OF KEY ISSUES IN ORGANIZATION THEORY AND BEHAVIOR. ISSUES INCLUDE ORGANIZATION DESIGN, INTERORGANIZATIONAL COORDINATION, INTELLIGENCE AND DECISION-MAKING SYSTEMS, LEADERSHIP AND MOTIVATION THEORIES, AND</td>
</tr>
</tbody>
</table>
theories of organizations as agents of political and social change. Case studies are used.

829 Doctoral Tutorial in Leadership (1-3:0:0). Prerequisites Permission of instructor and adviser; doctoral students from other programs may enroll only by permission of instructor. Individualized, intensive study of particular features of leadership. Study is arranged and supervised with the appropriate tutorial professor.

840 Doctoral Seminar in Analysis and Evaluation (3:3:0). Prerequisites Permission of instructor and adviser; doctoral students from other programs may enroll only by permission of instructor. Quantitative and qualitative approaches and techniques used in recognizing, defining, and assessing public issues and problems. Conceptualizing and assessing problems, employing and judging the strengths and weaknesses of tools and techniques, and identifying and categorizing the information required for competent analysis and evaluation.

849 Doctoral Tutorial in Analysis and Evaluation (1-3:0:0). Prerequisites Permission of instructor and participant’s advisory committee; doctoral students from other programs may enroll only by permission of instructor. Individualized, intensive study of particular features of analysis and evaluation. Study is arranged and supervised with the tutorial professor.

999 Doctoral Dissertation (18-24). To be taken only with permission of participant’s dissertation committee. Registration for the total credit hours may be spread over a multisemester contiguous period. D.P.A. candidates must register for at least three hours each semester until completion of the dissertation.

Sociology

Faculty

Avrukh, Kevin A., Ph.D., University of California at San Diego, 1978; Associate Professor

Bateson, Mary Catherine, Ph.D., Harvard University, 1963; Robinson Professor

Black, Peter W., Ph.D., University of California at San Diego, 1977; Associate Professor

Borkman, Thomasina S., Ph.D., Columbia University, 1969; Associate Professor

Burns, Tom R., Ph.D., Stanford University, 1969; Robinson Professor

Colvin, Mark W., Ph.D., University of Colorado, 1985; Assistant Professor

Dietz, Thomas M., Ph.D., University of California at Davis, 1979; Associate Professor

Gittler, Joseph B., Ph.D., University of Chicago, 1941; Visiting Professor

Golomb, Louis, Ph.D., Stanford University, 1976; Associate Professor

Horton, Lois E., Ph.D., Brandeis University, 1977; Associate Professor

Jacobs, Mark, Ph.D., 1987, University of Chicago; Assistant Professor

Kolker, Alliza, Ph.D., Columbia University, 1975; Associate Professor

Krech, Shepard, Ph.D., Harvard University, 1974; Professor

Laue, James H., Ph.D., Harvard University, 1966; Vernon M. and Minnie I. Lynch Professor of Conflict Resolution

Palkovich, Ann M., Ph.D., Northwestern University, 1978; Associate Professor

Rader, Victoria F., Ph.D., University of Chicago, 1973; Associate Professor

Rosenblum, Karen E., Ph.D., University of Colorado, 1979; Associate Professor

Scimecca, Joseph A., Ph.D., New York University, 1972; Professor

Tavani, Nicholas J., Ph.D., University of Maryland, 1969; Associate Professor

Williams, Thomas R., Ph.D., Syracuse University, 1956; Professor
Sociology, M.A.
The Department of Sociology and Anthropology offers a master’s degree in sociology. A student may choose a concentration in general sociology, applied sociology, sex and gender, race and ethnicity, or conflict analysis and management. The general sociology concentration allows maximum flexibility in the application of sociological knowledge to the analysis of social processes and systems. The applied concentration serves as a professional degree for the practitioner. The concentrations in race and ethnicity, sex and gender, and in conflict analysis provide advanced training in these areas. All five concentrations are appropriate for those anticipating further graduate study leading to the Ph.D. in sociology. The department provides opportunities for students to develop expertise in a variety of areas, including applied methods, community, criminology and juvenile delinquency, development and social change, deviance, environmental sociology, gerontology, medical sociology, occupations and professions, policy analysis, race and ethnicity, sociology of science and technology, and survey research.

Admission Requirements
In addition to meeting the general admissions requirements of the Graduate School, applicants must present:
1. A minimum of three semester hours each in undergraduate sociological theory, statistics, and research methods. Equivalent courses in other disciplines may be substituted for some of these requirements with permission.
2. Three letters of recommendation.
Acceptance of applicants to the program will depend upon assessment by the departmental graduate committee. While the Graduate Record Examination is not required for admission, it is recommended.

Nondegree Status
Students who do not wish to pursue a degree or who have not supplied all required documents may be admitted to nondegree status. Nondegree students may later apply for degree status. With approval, a maximum of 12 graduate credit hours earned in nondegree status may be applied to a master’s degree.

Degree Requirements
General Sociology. The degree requires 33 semester hours, including a core of 6 hours of social theory (Sociology 611, 612) and 6 hours of research methods (Sociology 620, 630). Students are also required to complete a master’s thesis or equivalent.

Applied Sociology. The degree requires 33 semester hours, including a core of 3 hours of social theory (Sociology 612), 6 hours of research methods (Sociology 620, 630), and 9 hours of applied sociology (Sociology 515, 632, 640). Students are also required to complete a master’s thesis or equivalent.

Sex and Gender. The degree requires 33 semester hours, including a core of 6 hours of social theory (Sociology 611, 612), 6 hours of research methods (Sociology 620, 630), and 9 hours in the sex and gender concentration. Students are also required to complete a master’s thesis or equivalent.

Conflict Analysis. The degree requires 33 semester hours, including a core of 6 hours of social theory (Sociology 611, 612), 6 hours of research methods (Sociology 620, 630), and 9 hours in the sociology of conflict and conflict management. Students are also required to complete a master’s thesis or equivalent.

Race and Ethnicity. The degree requires 33 semester hours, including a core of 6 hours of social theory (Sociology 611, 612), 6 hours of research methods (Sociology 620, 630), and 9 hours in the race and ethnicity concentration. Students are also required to complete a master’s thesis or equivalent.

The Master’s Thesis
A master’s thesis or equivalent, such as a research report, will be required for the M.A. degree in sociology to demonstrate a candidate’s capacity to carry out independent research. The thesis or its equivalent will consist of a substantial sociological research or theoretical project that will contribute to sociological knowledge.

Financial Aid
The Department of Sociology/Anthropology has a limited number of graduate assistantships. For information, please contact the department at 323-2900.

Sociology Courses (SOCI)
503 Family Law (3:3:0). Prerequisite Undergraduate senior status in sociology, graduate standing or permission of Instructor. An examination of the salient aspects of the law as it affects the family in our dynamic society. Topics include the nature and formalities of the marital relationship, intra-family torts and crimes, termination of the marital relationship, child custody and support, adoption, separation agreements, and the economic and sociological aspects of marriage, separation, and divorce.

505 Sociology of Sex and Gender (3:3:0). Prerequisite Graduate standing or permission of instructor. An advanced study of sex roles in contemporary society. Using historical and comparative data, course examines perceived, prescribed, and actual sex-differentiation in social, political, and economic roles.

510 Employees, Employers, and the Changing Labor Force (3:3:0). Prerequisite Graduate standing or permission of instructor. Focusing on the nature and origin of recent developments, e.g., in technology, affirmative action policy and debates, migration and immigration, and public and private job training programs, the course examines their impact on the social structure of work.
515 Applying Sociology (3:3:0). Prerequisite Undergraduate senior status in sociology; graduate status. Course provides overview of the ways sociologists have applied their theoretical and methodological skills and understanding in sociological practice in nonacademic settings.

523 Racial and Ethnic Relations: American and Selected Global Perspectives (3:3:0). Prerequisite Graduate standing or permission of instructor. Demographic purview of racial and ethnic groups in the United States: nature and meaning of 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 and ethnic minorities to minority status, programs, methods, social movements, and philosophies seeking to change minority group status.

525 Current Research in Sex and Gender (3:3:0). Prerequisite Graduate standing or permission of instructor. An advanced study of current social science research and research methodology used in the study of sex and gender.

541 Survey Research (3:3:0). Prerequisite PSYC 300 or SOCI 221 or equivalent. Course acquaints students with the theory, method, and practice of survey research design and analysis. Students must complete a survey research project.

599 Issues in Sociology (3:3:0). Prerequisite Undergraduate senior status in sociology; graduate status. Course explores topics of contemporary interest in sociology. Topics change from one semester to next and include issues in sociological theory, crime and delinquency, advanced research methods, social and cultural change, urban sociology, medical sociology, sociology of aging, rural sociology. May be taken only once for credit.

602 Sociology of Formal Organizations (3:3:0). Prerequisite Graduate standing or permission of instructor. Classical and contemporary theories governing formal organization, and issues such as nature of authority, implementation of change, and relationship between formal organization and society.

604 Sociology of Occupations and Professions (3:3:0). Prerequisite Graduate standing or permission of instructor. Theories of occupations and professions. Issues include educational patterns and social mobility, occupational status and prestige, importance of the work setting, work satisfaction and alienation, and impact of the professions on society.

606 Socialization Processes (3:3:0). Prerequisite Graduate standing or permission of instructor. Selected aspects of the cultural transmission process in specific local cultures selected from various world culture regions—e.g., Oceanic, Sub-Saharan Africa, India—emphasizing the origins, course of development, and present structure and functions of the intergenerational transmission of culture.

607 Criminology (3:3:0). Prerequisite Graduate standing or permission of instructor. Crime and crime causation. Topics include social basis of law, administration of justice, and control and prevention of crime.

608 (508) Juvenile Delinquency (3:3:0). Prerequisite Graduate standing or permission of instructor. Sociology of adolescent behavior. Sociological factors that determine which behaviors and social categories of adolescents are likely to be labeled and treated as delinquent.

609 Corrections (3:3:0). Prerequisite Graduate standing or permission of instructor. Critical assessment of American adult and juvenile correctional systems. In-depth analysis of current American correctional ideology of punishment and incarceration. Alternative models are advanced which stress community-based, community-controlled programming.

610 Qualitative Research Methods (3:3:0). Prerequisite Graduate standing or permission of instructor. Examination of basic research methods involving observational techniques and procedures used in description and analysis of the patterns, configurations, ethos, eldos, structures, functions, and styles typical of whole societies and cultures, with an emphasis on case studies, unobtrusive methods, participant observation, long-term 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.

611 Classical Sociological Theory (3:3:0). Prerequisite Graduate standing or permission of instructor. In-depth examination of major issues in classical (pre-1930) sociological theory. Durkheim, Marx, Weber, Mead and others are analyzed and the social and intellectual context of their theories is emphasized.

612 Contemporary Sociological Theory (3:3:0). Prerequisite Graduate standing or permission of instructor. Schools in contemporary sociological theory such as structural-functionalism, conflict, exchange, symbolic interactionism, ethnmethodology, humanist sociology and critical theory are examined. Contemporary theorists are analyzed in relation to the schools.

615 Social and Cultural Change (3:3:0). Prerequisite Graduate standing in sociology or permission of instructor. Social and cultural change in a transsocietal and transcultural (or comparative) perspective, with particular attention to theories, research methods, and conclusions concerning development and modernization in post-Colonial and "Third World" societies and cultures.

616 Society, Culture, and Personal Character (3:3:0). Prerequisite Graduate standing in sociology or permission of instructor. Transcultural (comparative) examination of the interrelations between social and cultural actors and individual personal character; focus on life history of individuals in particular social and cultural settings. Readings and discussions center upon theoretical
concerns, methodological approaches, and current research in study of social/cultural factors in personal character.

619 Conflict and Conflict Management: Perspectives from Sociology (3:3:0).
Prerequisite: Graduate standing in sociology or conflict management or permission of instructor. The course deals with the sociology of conflict. Such major sociological theories of conflict as those of Marx, Weber, Simmel, Dahrendorf, Coser, and Collins are presented. The role that sociological conflict theory plays in undergirding conflict management practices is stressed.

620 Design of Social Research (3:3:0).
Prerequisite: Graduate standing and undergraduate statistics and research methodology, or permission of instructor. Introduction to advanced strategies of social research used in the area of social policy analysis, including sample design, theory and techniques of measurement, questionnaire design, and data collection. Includes an introduction to various types of social research: survey, participant observation, case study, and evaluation research.

621 Human Ecology and the City (3:3:0).
Prerequisite: Graduate standing or permission of instructor. Introduction to urban ecology. Origin and development of various types of cities, shape and structure of urban areas, inner and outer city, and spatial patterning of urban institutions.

622 Metropolitan and Regional Development (3:3:0).
Prerequisite: Graduate standing or permission of instructor. Process of social development in the context of metropolitan and regional social change. Social development is considered in the light of economic, political, demographic, and human resource dimensions.

623 The Suburban Community (3:3:0).
Prerequisite: Graduate standing or permission of instructor. Systematic sociological study of the suburb: (a) its evolution and development (demographic and geographic); (b) its varied types; (c) its relation to the inner city; (d) as part of the metropolitan area and megalopolis; (e) its structure as a community including its formal and informal social groupings, organization and voluntary associations, family and social institutions, social stratification, and social mobility; (f) social change.

630 Analytic Techniques of Social Research (3:3:0).
Prerequisite: Graduate standing and undergraduate statistics and research methodology, or permission of instructor. Advanced strategies of social research used in the area of social policy analysis, focusing on analytic techniques such as analysis of variance and covariance, multiple regression and correlation, path analysis and elaborative contingency table analysis.

Prerequisite: SOC 620, 630 or permission of instructor. Study of methodological issues related to the evaluation of social programs. Conceptual and research design issues are explored in relation to social programs, particularly the delivery of social services. Includes the examination of methods used to assess the need for the programs, impact of delivery systems, and the efficiency and effectiveness of social programs.

633 Special Topics in Sociology (3:3:0).
Prerequisite: Graduate standing or permission of instructor.

640 Social Theory and Social Policy (3:3:0).
Prerequisite: Graduate standing or permission of instructor. Major theories of social organization and social change as a means of understanding social policy development. Concentration is on social policies in American society.

650 Health Systems Delivery (3:3:0).
Prerequisite: Graduate standing or permission of instructor. Analysis of the social factors associated with the delivery of health care. Several theoretical perspectives are used to highlight relevant elements. Planning for health from individual to federal processes is studied. The processes and problems of measuring the quality of health care are investigated.

651 (551) Medical Sociology (3:3:0).
Prerequisite: Graduate standing or permission of instructor. Social context of disease and medical care, the position of the professions in the medical care structure, the delivery of medical care, and the physician-patient relationship under different systems of practice.

680 Clinical Sociology (3:3:0).
Prerequisite: Graduate standing or permission of instructor. Introduction to theoretical principles, methods and procedures necessary to practice clinical sociology as an independent consultant or within private or public organizations. Such specialized applications as family counseling, organizational change, medical sociology and educational sociology are covered.

685 Sociology of the Disabled (3:3:0).
Prerequisite: Graduate standing or permission of instructor. Overview of social movements relating to the disabled including questions on how persons with handicaps manage living in their homes, schools, and workplace. Analysis of legislation and public programs as they relate to various disabling conditions.

686 Sociology of Aging (3:3:0).
Prerequisite: Graduate standing or permission of instructor. Analysis of sociological issues in aging. Issues include class and cultural factors, problems of work, of retirement, of attachment and of loss and ageism. Different theories of aging are examined.

696-697 Independent Study (3:0:0), (3:0:0).
Prerequisite: Graduate standing or permission of instructor. Theoretical and research literature chosen by student and instructor.

799 Thesis (3-6:0:0).

800 Studies for the Doctor of Arts in Education (variable credit).
Prerequisite: D.A.Ed. admission to study in sociology. Program of studies designed by student’s discipline director and approved by student’s doctoral committee, which brings the student to participate in the current research of the discipline director and results in a paper reporting the original contributions of the student. The paper is presented in a subsequent D.A.Ed. summer seminar. Enrollments may be repeated.
Certificates, Programs, and Additional Graduate Courses
Certificates, Programs, and Additional Graduate Courses

Certificates

Teaching of English as a Second Language (TESL)

Admission Requirements
Applicants interested in a Certificate in the Teaching of English as a Second Language must be admitted to graduate study through the Graduate School or approved for graduate course enrollment through the School of Continuing and Alternative Learning. Students who initially enroll in the certificate program through the School of Continuing and Alternative Learning must apply for regular admission through the Graduate School no later than the second semester of study. At the time formal admission to graduate study is sought, applicants must submit one copy of a writing sample of approximately 1,000 words 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 Services, the Department of English, and the Department of Foreign Languages and Literatures, and part of the work toward the certificate may be applicable toward degrees in those departments.

Students enrolled in another graduate degree program who wish to work for the certificate must apply to the English Department for admission into the certificate program.

Certificate Requirements
Certificate candidates must complete the following series of graduate English courses, earning a grade of B or better in each.

1. ENGL 520, 522, 582, and 521 (EDCI 519 may be substituted for ENGL 521)
2. One of the following courses: ENGL 507 (EDCI 507), 581, 615, 690, 784. (Additional courses, including some from other departments, may be used to fulfill this requirement. Apply to the Department of English for a list of approved electives.)

Graduate Certificate in Gerontology

Committee
Doreen Harper, Mary Montebello, Robert Ruhling, Aliza Kolker, Jeanne Mellinger, Molly Davis

The Graduate Certificate in Gerontology is administered by the School of Continuing and Alternative Learning through the Office of Individualized Study Programs.

Five departments, including the Departments of Sociology, Psychology, Nursing, Education, and Health and Physical Education, have developed a graduate certificate program in gerontology. This program combines theoretical and applied course work in aging with the student’s graduate curriculum in one of these departments. Since gerontology is by definition multidisciplinary, the certificate program requires students to take course work outside their major field.

A student applying to the certificate program must be in graduate degree status or hold a master’s degree in psychology, education, nursing, or a service-related discipline (e.g., social work, recreational therapy, physical therapy). A student who already holds a master’s degree must choose an area of specialization. As a prerequisite, a student must have had an undergraduate or graduate survey course in aging. The certificate requires 18 hours of graduate courses: 6 in the major area of specialization, 6 outside the major, and 6 hours of practicum (if applicable).

Students may obtain counseling and an application form from the Office of Individualized Study Programs, Room 124 East Building, 323–2342.

Graduate Certificate in Information Management and Expert Systems

The graduate certificate in Information Management and Expert Systems has been designed for persons in fields such as business, education, government, law, liberal arts, medicine, or nursing who wish to learn how to manage information resources that use computer technology. The program is designed to offer professional development for persons whose responsibilities include the management of a computer-based system of any size. It offers a broad group of tools and techniques, stressing the important role of expert systems to help individuals and organizations harness the full potential of the computer in applied settings.

Program Requirements
An applicant to the certificate program should have a bachelor’s degree with a 2.75 GPA or higher for the last 60 semester hours of course work leading to an undergraduate degree and have completed the Graduate Management Admission Test (GMAT) with a grade of 500 or higher. Application is made...
Graduate Certificate in Nursing Administration

The certificate program is designed for the student with a master’s degree in nursing who wishes formal study in theory and practice in nursing administration in the health care delivery system.

Program Requirements

An applicant to the certificate program must have a master’s degree in nursing from an NLN accredited program. Application is made through the Graduate School of the University. A requirement for the certificate is 18 credits of graduate courses in which a 3.00 GPA is maintained.

Program Content

The program for the certificate (18 credits) consists of the following required courses:

- MGMT 610 (formerly BUAD 660) Management Theory and Practice, or equivalent (3)
- NURS 763 Administrative Theory in Nursing (3)
- NURS 766 Administrative Strategies in Nursing (3)
- NURS 768 Practicum in Nursing Administration I (3)
- NURS 769 Practicum in Nursing Administration II (3)

Graduate Certificate in Nursing Education

The graduate certificate in nursing education combines foundation courses in education with courses in the principles and practices of nursing education. The program prepares students to function in nursing educational roles in both academic and nonacademic settings.

Program Requirements

Individuals applying to the graduate certificate in nursing education must be in degree status in the graduate nursing program or hold a master’s degree in nursing from an NLN-accredited program. Application is made through the Graduate School of the University.

Program Content

- NURS 657 Overview in Nursing Education (3)
- NURS 658 Practicum in Nursing Education (3-6)
- (Students must complete 15 credits with a 3.00 GPA. Those who, by virtue of their educational experiences, qualify for a three-credit practicum may choose the remaining three credits from courses designated by the School of Nursing.)
- EDUC 531 Educational and Psychological Measurement (3)
- EDUC 701 Educational Program Development (3)
- Total 15 credits

A student must complete all required courses and two electives with a 3.00 GPA to achieve the certificate.

Required Courses (9 credits)

- NURS 698 International Nursing (3)
- NURS 699 Practicum in International Nursing (3)
- NURS Elective (3)

Suggested Electives (15 credits)

- GOVT 536 Context of Development
- GOVT 537 Selected Problems of Third World Development
- ECON 765 Economics of Development
- ECON 766 Seminar in Latin American Development
- NURS 670 Cultural Dimensions of Aging

Graduate Certificate

Required Courses

IRM 610 Computer Systems for Management
IRM 720 Analysis and Design of Computer Systems
IRM 795 Business Expert Systems

Plus two of the following:

IRM 730 Decision Support Systems
IRM 735 Management Information Systems
IRM 740 Data Base and Data Communications
IRM 750 Managerial Applications of Microcomputers
IRM 760 Human Engineering Issues in Computer System Design
IRM 770 Legal Issues in Information Resource Management
IRM 780 Knowledge-Based Systems for Business
IRM 790 Advanced Issues in Information Resource Management
IRM 792 Topics in Information Resource Management

Technical Foundation Courses (9 credits)

- MGMT 610 (formerly BUAD 660) Management Theory and Practice, or equivalent (3)
- NURS 763 Administrative Theory in Nursing (3)
- NURS 766 Administrative Strategies in Nursing (3)
- NURS 768 Practicum in Nursing Administration I (3)
- NURS 769 Practicum in Nursing Administration II (3)

Electives

- NURS Elective (6)

In addition, the student must complete a minimum of 3 credits of electives in areas of specialization.

Program Content

Fifteen hours of course work are required for the certificate. Students without a strong background in information management must first take the introductory course, IRM 610, or its equivalent before any of the remaining course work. At most, three semester hours may be transferred from previous work at other universities toward this program.

Graduate Certificate in International Nursing

The graduate certificate in international nursing provides an opportunity for students to enrich their understanding of international health through a sequence of courses including, but not limited to, international nursing, anthropology, international relations, and economics.

Program Requirements

A student applying to the certificate program must be in degree status in the graduate nursing program or hold a master’s degree from an NLN-accredited program. Application is made through the Graduate School of the University.

Required Courses (9 credits)

- NURS 698 International Nursing (3)
- NURS 699 Practicum in International Nursing (3)
- NURS Elective (3)

Suggested Electives (15 credits)

- GOVT 536 Context of Development
- GOVT 537 Selected Problems of Third World Development
- ECON 765 Economics of Development
- ECON 766 Seminar in Latin American Development
- NURS 670 Cultural Dimensions of Aging

A student must complete all required courses and two electives with a 3.00 GPA to achieve the certificate.
Continuing Nursing Education

Continuing nursing education is an important commitment of the School of Nursing at the University and activities are planned so that individuals can grow personally and professionally.

The School of Nursing, in cooperation with the School of Continuing and Alternative Learning, offers opportunities for credit and noncredit courses representing a variety of subjects focusing on the concerns of nurses and health care consumers.

When planning and presenting continuing education program activities, the School of Nursing utilizes the wealth of available resources in the Northern Virginia area. Comments and suggestions for programming from the health care community are welcomed and encouraged. To be placed on the mailing list to receive notice of specific activities scheduled throughout the academic year, contact either the School of Nursing or the Division of Continuing Education.

Northern Virginia Cooperative Graduate Engineering Program

Graduate programs in engineering and information technology are offered under the auspices of a Cooperative Network in Northern Virginia. This network includes George Mason University (the host institution), Virginia Polytechnic Institute and State University (VPI), and the University of Virginia (UVA), and employs a mix of direct classroom laboratory instruction from GMU and live interactive televised lectures from VPI and UVA. Afternoon and evening instruction is provided at several classroom sites, including the GMU Fairfax Campus, the GMU Metro Campus, the UVA/VPI Telestar Northern Virginia Academic Center, and additional off-campus locations, including corporate televised receive sites.

Master's degrees are offered by either UVA, VPI, or GMU following successful completion of the appropriate program of study. Students apply to a degree program at one of these three institutions based upon course offerings and programs sponsored by an institution and the individual direction a student wishes to follow. Program requirements are the responsibility of the degree-granting institution and, subject to these requirements, courses may be taken from any of the three universities. Within the framework of departmental and graduate school approval, the majority of courses must be taken through the student's home institution, and additional courses approved by the home institution may be transferred among the three cooperating institutions. UVA and VPI degree programs are composed primarily of televised courses and are supported by additional courses from the host institution, GMU. These degree programs do not have a thesis or research component. GMU degree programs do have a research project or thesis component and are composed primarily of live classroom instruction, with the possibility of transferring televised courses into these degree programs from VPI and UVA.

Discipline areas of the degree programs from the University of Virginia include the Master of Materials Science, the Master of Engineering in Chemical Engineering, Mechanical and Aerospace Engineering, Electrical Engineering, Systems Engineering, or Civil Engineering (Structural Focus). From VPI the following degree programs are offered: Master of Engineering Administration, Master of Science in Mechanical Engineering, Electrical Engineering, Civil Engineering (Environmental Focus) and Aerospace and Ocean
Engineering, and the master of science and master of engineering in Systems Engineering. GMU offers master of science degree programs (described within this catalog) in Computer and Electronics Engineering, Computer Science, Information Systems, Operations Research and Management Science, and Systems Engineering. Also offered from GMU is the doctor of philosophy in Information Technology.

Qualified students who wish to take particular graduate courses for professional development may enroll without pursuing formal graduate degree programs. Admission is based on the student's background and space available. The Northern Virginia Cooperative Graduate Engineering Program is one of three cooperative efforts in the commonwealth, the others hosted by Virginia Commonwealth University in Richmond and Old Dominion University in Tidewater. This statewide network, with five participating major universities, is also supported by the Virginia Department of Information Technology and the State Council of Higher Education in Virginia, and provides expanded academic resources to three major urban communities of the commonwealth.

For program information, contact the Cooperative Graduate Engineering Program, School of Information Technology and Engineering, GMU, (703) 323-3194.

American Studies Courses (AMST)

502 Problems in American Culture (3:3:0). Prerequisite Graduate standing. Interdisciplinary study of a particular aspect of American culture. Limited to 15 students. Specific content varies and is announced before registration. May be repeated with permission of chair.

690 Internship (2-6:0:0). Prerequisite Permission of chair. Internships are nonpaying, work-study positions established by AMST program with employers involved in interdisciplinary AMST issues. Qualified students are placed with area schools, interest groups, agencies, museums, parks or corporations. Placement depends upon availability of positions.

Art History Courses (ARTH)

592 Exhibitions Projects (3:3:0). Prerequisite B.A. or equivalent or permission of instructor. Planning, promotion and production of visual art presentations and related events on the GMU campus. Exhibitions are produced by students who alternately serve in all operational capacities from proposal research and budget planning to the graphic design of announcements and the installation of exhibitions.

593 Art Apprenticeships (3-6:0:0). Prerequisite B.A. or equivalent or permission of instructor. Seminar followed by an apprenticeship or internship project with a professional individual or organization in the field of visual arts in the D.C. area. An apprenticeship may provide an introductory work experience in the professional area in which the student is considering a career.

596 Independent Study (3:3:0). Prerequisite B.A. or equivalent or permission of instructor. Independent reading and research on a specific project under the direction of a department faculty member. A written report is required. May be repeated for credit.

599 Special Topics in the History of Art (3:3:0). Prerequisite B.A. or equivalent or permission of instructor. Topics vary and include women in art, art patronage, art criticism, and others.
Communication Courses (COMM)

Communication courses at the 500 level are open to postbaccalaureate students or communication majors with advanced undergraduate standing and other seniors with permission of department.

501 Communication in Professional Relationships (3:0:0). Theoretical perspectives and relevant research related to communication techniques useful in various professional roles and situations. Relates theoretical foundations to practice, allowing individual students to assess theories of communication and their applications in individual professional fields.

502 Theories of Interpersonal Communication (3:0:0). Prerequisite COMM 301 or permission of instructor. Contemporary theories of interpersonal communication. Analysis of theories, concepts and approaches to the improvement of interpersonal communication. Extensive examination of interpersonal communication research is included.

504 Communication and Interpersonal Conflict (3:0:0). Prerequisite Admission to Graduate School or senior standing and permission of instructor. This course provides a theoretical introduction and experiential learning in the role of communication in conflict and conflict management. The focus is upon interpersonal interactions, including dyadic and small group levels in various settings such as friendships, marriage, family, and the workplace. The course examines the factors that generate conflicts and the communication strategies and skills that help shape conflict interaction toward productive ends. Class activities include lectures, guided discussions, case analyses, exercises, and simulations.

505 Intercultural Communication (3:0:0). Analysis of communication variables as they relate to communication across cultures. Topics include nonverbal communication, time conceptualizations, perceptual and attitudinal foci, values, social organization patterns, cultural norms, language ethics, conflict across cultures and research in intercultural communication.

506 Communication in International Organizations (3:0:0). Analysis of communication variables as they relate to organizational and managerial functions within international organizations. Focus on interpersonal aspects of government and business relations both outside the U.S. and with foreign visitors in the U.S., with extensions being made to management of subcultural differences within U.S. national organizations. Emphasis on developing an understanding of how cultural differences influence managerial activities, and upon learning to deal effectively with these cultural differences.

510 Studies in Oral Interpretation (3:0:0). A comprehensive examination of the role of the oral communicator in the selection, adaptation and performance of literature. Seminar course topics vary depending upon genre being considered. May
be repeated three times for credit if each course is devoted to a different genre.

530 Theories of Small Group Communication (3:3:0). Advanced levels of theory and practice of small group interaction. Examination of current research in small group communication; a focus on learning the theory and application of the theory to relevant setting.

531 Approaches to Group Facilitation (3:3:0). Introduces various theoretical and practical approaches to group facilitation with indepth focus and practice with one approach. Students participate in group sessions, analyze videotapes of decision-making groups, and practice different methodologies for facilitating group interaction.

535 Organizational Communication (3:3:0). An analysis of communication systems and processes within organizations, both public and private. Specific topics include conflict management, group decision making, interviewing, technical presentations, and use of various channels to improve internal and external communication for the organization.

536 Communication Consulting (3:3:0). Prerequisite COMM 335. Investigation of theories which serve as the foundation for communication consulting. Designed to provide both the theoretical information and mechanisms for application necessary to modify communicative behavior within organizations.

540 Directing Forensics Programs in Individual Events (3:3:0). An investigation of the role of the individual events forensics educator in developing a high school or college program, coaching and judging competitive original speaking and oral interpretation events, and tournament management.

542 Directing Debate Activities (3:3:0). Theory and practice of competitive debate. Emphasis on traditional and contemporary theories of debate, administrative activities related to the direction of a debate program, and methods of instruction in debate, including analysis of current debate topic. Designed for both novice and experienced debate coaches.

543 Advanced Debate Theory (3:3:0). Prerequisite Prior debate and/or debate coaching experience or permission of instructor. Theoretical issues involved in the practice of debate. Critical examination of new issues in theory and discussion of revisions in theories designed to enhance academic debate.

550 Communication in the Classroom (3:3:0). Prerequisite 84 hours. Examination of both verbal and nonverbal elements in the classroom which produce meaning among teachers and students. Communication theories and skills needed to manage the communication environment in the classroom. Nonverbal aspects of space, time, action, and form are considered as they impact teaching choices. Verbal patterns for skills of classroom management: questioning skills, enhancing students' self-concept, systematic feedback, parental communication and student development.

551 Developing Students' Speaking and Listening Skills (3:3:0). Prerequisite 84 hours. Speaking and listening skills which develop the oral communication competency of children and adolescents. Emphasis on development of assignments that both directly and indirectly develop communication competence. The five functions of communication and steps in developing them are developed in the context of integrating the basic skills at the elementary level and direct teaching at the secondary level. Issues of definition in terms of philosophies of communication education and curriculum development, as well as competency assessment are covered.

555 Theories of Telecommunications Production (3:3:0). Prerequisite Approval of M.A.I.S. or permission of instructor. Telecommunications production theories involving computers, computer graphics, television cameras, computerized editing, audio mixing, and other production tools available for electronic communication. Explores problems of fitting messages to various media, including aesthetic demands on product imposed by new technologies.

590 Seminar in Communication (3:3:0). Intensive study of specific topics in interpersonal, public and mass communication. Specific content varies. May be repeated for credit with permission of department.

596 Directed Readings and Research (1-3:0:1-3). Prerequisite Graduate standing and permission of department. Reading and research on a specific topic, under the direction of a faculty member. A written report is required; an oral or written examination over the material may be required. Course may be repeated for a maximum of six credits.

597 Independent Production (1-3:0:1-3). Prerequisite Graduate standing and permission of department. Media or creative production activities, under the direction of a faculty member. A completed production is required; a written report and an oral examination may be required. Course may be repeated for a maximum of six credits.

800 Studies for the Doctor of Arts in Education (variable credit). Prerequisite D.A.Ed. student admission to study in communication. A program of studies designed by student's discipline director and approved by student's doctoral committee. Course work allows the student to participate in the research activity of discipline director and results in a paper reporting original contributions of the student. The paper is presented in a subsequent D.A.Ed. summer seminar. Enrollment may be repeated.
Dance Courses (DANC)

510 Independent Study (3:0:0). Prerequisite Dance major with 84 hours, graduate standing in dance or theatre or permission of instructor. Individual research or a creative project in close consultation with an instructor. Projects selected from performance, choreography, technical theatre as it applies to dance management, dance history, or criticism.

527 Advanced Modern Dance (3:0:6). Prerequisite Audition. Course provides the advanced student the opportunity for continued training. Emphasis and importance is placed on the attainment of high technical quality and performing skills. Six hours per week. May be taken for a total of 16 credits.

560 Advanced Choreography (3:3:0). Prerequisite DANC 360 or permission of instructor. Intensive study and exploration of advanced choreographic forms culminating in a public performance of a complete dance work. Three hours per week. May be taken for a total of 12 credits.

570 Advanced Dance Performance (3:0:6). Prerequisite Audition or permission of instructor. Advanced exploration into performance, repertory, and/or production skills through participation in University dance productions, special guest artist programs, or professional dance companies. May be taken for a total of 12 credits.

598 Philosophy and Aesthetics of Dance (3:3:0). Prerequisite DANC 390 and 391 or permission of instructor. A study of the philosophical theories and aesthetic principles of dance as a performing art. What dancing is, what it expresses, what it creates, and how it is related to other arts and artists are explored.

Geology Courses (GEOL)

500, 501 Selected Topics in Modern Geology (1-3:1-3:0), (1-3:1-3:0). Prerequisite Baccalaureate degree in geology or permission of instructor. Lecture/lab/field trip. Topic is designated in the class schedule.

514 Biostratigraphy and Biofacies Analysis (4:3:3). Prerequisite Baccalaureate degree in geology or permission of instructor. Use of fossils in correlating and dating rock units in various fields of energy exploration. Relationships between fossils and paleoenvironments. May include field trips.

515 Advanced Structural Geology (4:3:3). Prerequisite Baccalaureate degree in geology or permission of instructor. The concepts of stress and strain in rock materials, and the application of this theory to understanding complex three-dimensional structures in deformed rocks. Emphasis is placed on a quantitative approach to resource deposits. May include field trips.

516 Appalachian Stratigraphy (3:3:0). Prerequisite Baccalaureate degree in geology or permission of instructor. Analysis of the stratigraphy and tectons of sedimentary rocks of the Appalachian Mountain system, with emphasis on the stratigraphic provinces that contain energy resources.

518 Geochemical Methods of Analysis (4:3:3). Prerequisite Baccalaureate degree in geology or permission of instructor. Principles and application of geochemical analysis as applied to rocks found in areas of energy resources. Concentration on techniques of x-ray and optical spectroscopy and atomic absorption.

800 Studies for the Doctor of Arts in Education (variable credit). Prerequisite D.A.Ed. admission to study in geology. Program of studies designed by student's discipline director and approved by student's doctoral committee, which brings the student to participate in the current research of the discipline director and results in a paper reporting the original contributions of the students. The paper is presented in a subsequent D.A.Ed. summer seminar. Enrollments may be repeated.

Philosophy and Religious Studies Courses (PHIL)

505 Professional Ethics (3:3:0). Advanced study of ethical theory as it applies to moral problems that arise in business and professional contexts.

510 Seminar in the Ethics of Health Care (3). Prerequisite Junior–senior or graduate standing or permission of instructor. An examination of moral dilemmas within the health care profession based on ethical theories and principles. Special emphasis on patients' rights, social justice of health care and evolving health care technologies.
555 Environmental Ethics (3). Prerequisite Junior-senior or graduate standing, and 3 credits in philosophy plus a combined total of 9 additional credits in philosophy and science or permission of instructor. Examination of ethical principles affecting environmental issues with special emphasis on the problems encountered by environmental biologists.

574 Current Issues in Philosophy of Psychology (3:3:0). Prerequisite A combined total of at least 12 credits in philosophy or psychology, at least 3 of which must be in philosophy and at least 3 of which must be at 300 level or above, or permission of instructor. A careful examination of some issue or issues of current interest to both philosophers and psychologists. Typical of issues examined are the mind-body problem, philosophical and psychological implications of work in artificial intelligence, and philosophical issues in psycholinguistics.

591 Special Topics in Philosophy (3:3:0). Prerequisites Graduate standing and permission of instructor. Examination of specific topics in philosophy which are of central interest in that field and of interdisciplinary interest as well. Topics will be selected with special reference to the areas of philosophy of technology, aesthetics, philosophy of religion, and ethics and social and political philosophy. Course may be repeated for credit up to three times (when the course content differs) with permission of the instructor and the student's adviser.

800 Studies for the Doctor of Arts in Education (variable credit). Prerequisite D.A.Ed. admission to study in philosophy. Program of studies designed by student's discipline director and approved by student's doctoral committee which brings the student to participate in the current research of the discipline director and results in a paper reporting the original contributions of the student. The paper is presented in a subsequent D.A.Ed. summer seminar. May be repeated.
General Policies
General Policies

Conduct

The University respects and protects the individual dignity, integrity, and reputation of its students. Students are required to comply with the conventions and regulations of University life that are necessary to maintain order, protect individuals and property, and fulfill the purposes and responsibilities of a university.

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) confers upon the University the responsibility for maintaining order within the University and the right to exclude those who are disruptive.

The Office of the Associate Vice President and Dean for Student Services is administratively responsible for supervising student conduct on campus. A system of courts administers nonacademic discipline. In addition to these courts, the student Honor Committee, described in Graduate Policies and Procedures, is responsible for adjudicating violations of the Honor Code that relate to academic matters. Questions regarding student conduct should be directed to the Office of the Associate Vice President and Dean for Student Services, in Room 302 of Student Union I (323-2522).

Privacy of Student Records

Annually, George Mason University informs students of the Family Educational Rights and Privacy Act of 1974. This Act, with which the institution intends to comply fully, was designed to protect the privacy of education records, to establish the right of students to inspect and review their education records, and to provide guidelines for the correction of inaccurate or misleading data through informal and formal hearings. Students also have the right to file complaints with the Family Educational Rights and Privacy Act office (FERPA) concerning alleged failures by the institution to comply with the Act.

Questions concerning the Family Educational Rights and Privacy Act may be referred to the Office of the Registrar.

Statement on Drugs and Alcohol

The abuse of drugs and alcohol by members of the George Mason University community is incompatible with the goals of the University. By defining standards of behavior and by providing educational programs to create an awareness of drug and alcohol-related problems, the University attempts to prepare individuals to act responsibly. Those in need of assistance in dealing with such problems are encouraged to seek the confidential services of the University’s counseling center or the student health service.

Drugs. The University prohibits the possession and use of illegal drugs. Possession, sale, use, or distribution of controlled substances, including marijuana, is a violation of both federal and state laws and University regulations.

Alcohol. The use of alcoholic beverages on campus is at the discretion of the University and is subject to state alcoholic beverage regulations. Unless the University has specifically sanctioned the location and condition of alcohol use, the possession and consumption of alcohol on campus is prohibited.

Individuals involved in the sale, use, or distribution of controlled substances (drugs and alcohol) are subject to arrest and University disciplinary action. The University imposes a variety of sanctions, which include eviction from University housing and suspension or dismissal from the University.

Adopted by the Board of Visitors on May 12, 1987.

Motor Vehicles Policy

The privilege of operating and parking a motor-driven vehicle at George Mason University is extended to all students, subject to the following procedures:

Vehicles must be registered with the Parking Services Office. At the time of registration, operators must certify that (a) vehicles have a valid state registration and valid insurance from a recognized insurance company, evidencing coverage for public liability in conformance with the laws of the Commonwealth of Virginia; (b) they have a valid state driver’s license; and (c) they understand that they are governed by University Motor Vehicle and Traffic Rules and Regulations, a copy of which is furnished at the time of
registration of the vehicle. A state vehicle registration card must be provided at the time of registration. Vehicular registration decals may be purchased for the full academic year or by the semester or summer session.

The Parking Services Office is at the rear of the West Building in T-102, and in Student Union I, second floor, old Patriots Locker.

Registered vehicles must display in full view the University's vehicular registration decal, affixed immediately upon issue as per the instructions on the reverse side of the decal.

See Motor Vehicle Fees in the Tuition, Fees, and Financial Aid section for decal fees.

Other Regulations

Firearms

The unauthorized possession, storage, display, or use of any kind of ammunition, firearms, fireworks, explosives, air rifles, air pistols, or other lethal instruments is prohibited on University property. Any questions regarding this regulation should be directed to the Campus Police (323-2158).

Smoking

Smoking is not permitted in classrooms, lecture halls, theaters, or in the University libraries. Lounge areas in the student union buildings and other University buildings have been set aside for this purpose.

Bicycles/Skateboards

Bike racks are provided at various locations on campus for the convenience of students who bike to and from the University. For resident students, storage areas for bikes are near Buildings 2, 4, and 8. Bikes may be parked only in these areas.

Bikes and skateboards are not permitted on sidewalks, ramps, footpaths, or grassy areas of campus or inside University buildings.

Pets

No pets are permitted in University buildings at any time. Additionally, pets that are on campus grounds must be on a leash and under supervision at all times.

Solicitors and Salesmen

Solicitors and salesmen, except on official business with the University, are not permitted on the campus without prior approval of the Business and Finance Office.
Campus Map, Telephone Directory, and Index
Campus Map, Telephone Directory, and Index

Campus Map

http://catalog.gmu.edu
The general information number for George Mason University is (703) 323-2000. The University exchange is "323" except where indicated.

Graduate School
Charles K. Rowley, Dean ........................................ 2123
102 Finley Building
James W. Fonseca, Associate Dean ............................. 2124
100 Finley Building
Amelia A. Rutledge, Acting Associate Dean ................... 2124
100 Finley Building
Anne M. Miner, Office Manager, Admissions ................... 2105
100 Finley Building
Admitted Student Adviser ........................................ 2708
100 Finley Building
Admissions Adviser ............................................... 2105
100 Finley Building

Departments and Chairpersons
Accounting/Business Legal Studies Department ................ 2752
Kenneth Heller, Chair, 4639 Robinson Hall
Art Department .................................................. 2076
Carol Mattusch, Chair, 1110 Robinson Hall
Biology Department ............................................. 2181
Larry L. Rockwood, Chair, 3005 David J. King Hall
Business Administration Program ................................ 2764
Richard L. Coffinberger, Associate Dean
4611 Robinson Hall
Chemistry Department ........................................... 4327
Louis Meltes, Chair, 343A Science and Technology Building
Communication Department ...................................... 3575
Don Bolleau, Chair, 212C Thompson Hall
Computer Science Department ................................... 2713
David C. Rine, Chair, 209A Thompson Hall
Curriculum and Instruction Department ....................... 6086
Robert Gilstrap, Chair, 3307 Robinson Hall
Decision Sciences Department ................................... 2758
Barry Render, Chair, 4661 Robinson Hall
Economics Department ........................................... 2344
Karen Vaughn, Chair, 3655 Robinson Hall

Educational Leadership and Human Development ................ 6103
Albert Edgemon, Chair, 3334 Robinson Hall
Electrical and Computer Engineering Department ............. 2302
W. Murray Black, Chair, 2067 David J. King Hall
English Department ............................................. 2221
Johannes Bergmann, Chair, 4565 Robinson Hall
Finance Department ............................................. 2756
Michael Ferrl, Chair, 4634 Robinson Hall
Foreign Languages and Literatures Department ............... 2231
Martha P. Francescato, Chair, 231 Thompson Hall
Geology Department ............................................. 2260
Douglas Mose, Chair, 2080 David J. King Hall
Health, Sport and Leisure Studies Department ................. 2322/2829
Robert Ruhling, Chair, 204 Physical Ed. Building I
History Department .............................................. 2242
Marion Deshmukh, Chair, 2535 Fenwick
Information Systems and Systems Engineering Department ... 3530
Stephen Andriole, Chair, 203 Science and Technology Building
Management Department ......................................... 2750
John A. Pearce II, Chair, 3658 Robinson Hall
Marketing Department ........................................... 2754
Kevin McCrohan, Chair, 4635 Robinson Hall
Mathematical Sciences Department ............................. 2577
Stephen N. Saperstone, Acting Chair, Module A
Mathematics Department ......................................... 2759
Catherine E. Connelly, Associate Dean, 3376 Robinson Hall
Operations Research and Applied Statistics Department ...... 6200
Arnold Gabriel, Chair, 417 Humanities Building
Physics Department .............................................. 2303
Robert Ehrlich, Chair, 142 West Building
Psychology Department .......................................... 2203
Jane M. Flinn, Chair, 2003 David J. King Hall
Public Affairs Department ....................................... 2272/2273
Harold F. Gortner, Chair, 2203 Robinson Hall
Social Work Department .......................................... 2910
Jirina S. Polivka, Chair, 3537 Fenwick
Sociology and Anthropology Department ........................ 2900
Peter W. Black, Acting Chair, 3603 Robinson Hall
<table>
<thead>
<tr>
<th>Administrative Offices</th>
</tr>
</thead>
<tbody>
<tr>
<td>The general information number for George Mason University is (703) 323-2000. The University exchange is &quot;323&quot; except where indicated.</td>
</tr>
<tr>
<td>Academic Affairs, Vice President</td>
</tr>
<tr>
<td>Administration, Vice President</td>
</tr>
<tr>
<td>203 Finley Building</td>
</tr>
<tr>
<td>Admissions, Dean</td>
</tr>
<tr>
<td>Law, Metro Campus</td>
</tr>
<tr>
<td>Bookstore-Main Campus</td>
</tr>
<tr>
<td>Benn Crandall, Student Union II</td>
</tr>
<tr>
<td>George R. Umberger, Dean, Cooperative Education</td>
</tr>
<tr>
<td>Cooperative Graduate Engineering Program</td>
</tr>
<tr>
<td>George R. Umberger, 101 Science and Technology Building</td>
</tr>
<tr>
<td>Counseling Center</td>
</tr>
<tr>
<td>Ralph K. Roberts, 364 Student Union I</td>
</tr>
<tr>
<td>Dean, College of Arts and Sciences</td>
</tr>
<tr>
<td>Paula Gilbert Lewis, 206 Thompson Hall</td>
</tr>
<tr>
<td>Dean, College of Education and Human Services</td>
</tr>
<tr>
<td>Larry S. Bowen, 2373 Robinson Hall</td>
</tr>
<tr>
<td>Dean, School of Continuing and Alternative Learning</td>
</tr>
<tr>
<td>Robert T. Hawkes, Jr., 204 East Building</td>
</tr>
<tr>
<td>Dean, School of Business Administration</td>
</tr>
<tr>
<td>Coleman Raphael, 4610 Robinson Hall</td>
</tr>
<tr>
<td>Dean, School of Information Technology and Engineering</td>
</tr>
<tr>
<td>Andrew P. Sage, 103 Science and Technology Building</td>
</tr>
<tr>
<td>Dean, School of Law</td>
</tr>
<tr>
<td>Henry G. Manne, 269 Metro Campus</td>
</tr>
<tr>
<td>Dean, School of Nursing</td>
</tr>
<tr>
<td>Rita M. Carty, 3350 Robinson Hall</td>
</tr>
<tr>
<td>Disabled Student Services</td>
</tr>
<tr>
<td>Paul F. Bousel, 345 Student Union I</td>
</tr>
<tr>
<td>Finance and Planning, Vice President</td>
</tr>
<tr>
<td>Maurice W. Scherrens, 201 Finley Building</td>
</tr>
<tr>
<td>Financial Planning and Resources</td>
</tr>
<tr>
<td>Rita Bodie, 354 Student Union I</td>
</tr>
<tr>
<td>Housing Services</td>
</tr>
<tr>
<td>Bonnie Hankins, Assistant Director, 310 Student Union I</td>
</tr>
<tr>
<td>International Student Services</td>
</tr>
<tr>
<td>Hamdesa Tuso, Acting Coordinator, 304 Student Union I</td>
</tr>
<tr>
<td>Library-Fenwick</td>
</tr>
<tr>
<td>Charlene Hurt, Director, 2226 Fenwick</td>
</tr>
<tr>
<td>Library-Law</td>
</tr>
<tr>
<td>Philip C. Berwick, Director, Metro Campus</td>
</tr>
<tr>
<td>Minority Student Services</td>
</tr>
<tr>
<td>Charles Smith, 352 Student Union I</td>
</tr>
<tr>
<td>Placement</td>
</tr>
<tr>
<td>Cynthia Sedgwick, 348 Student Union I</td>
</tr>
<tr>
<td>President</td>
</tr>
<tr>
<td>George W. Johnson, 208 Finley Building</td>
</tr>
<tr>
<td>Public Relations</td>
</tr>
<tr>
<td>Helen J. Ackerman, Assistant Vice President, 214 Finley Building</td>
</tr>
<tr>
<td>Registrar</td>
</tr>
<tr>
<td>Michael J. McDermott, Jr., Krug Hall</td>
</tr>
<tr>
<td>Recorder, Law</td>
</tr>
<tr>
<td>Mandy Euen, Metro Campus</td>
</tr>
<tr>
<td>Student Financial Aid</td>
</tr>
<tr>
<td>Rita Bodie, 354 Student Union I</td>
</tr>
<tr>
<td>Student Government</td>
</tr>
<tr>
<td>252 Student Union I</td>
</tr>
<tr>
<td>Student Health Services</td>
</tr>
<tr>
<td>Carol J. Sudol, 232 Student Union I</td>
</tr>
<tr>
<td>Student Publications</td>
</tr>
<tr>
<td>Broadside/Phoebe/By George!</td>
</tr>
<tr>
<td>Student Union I/II</td>
</tr>
<tr>
<td>Student Teaching and Field Experiences</td>
</tr>
<tr>
<td>Jeremy Burnham, 3393 Robinson Hall</td>
</tr>
<tr>
<td>Summer Session</td>
</tr>
<tr>
<td>Donna R. Bafundo, Director, 129 East Building</td>
</tr>
<tr>
<td>Testing Center</td>
</tr>
<tr>
<td>Elizabeth Murnane, 117 Finley Building</td>
</tr>
<tr>
<td>Tutorial Services</td>
</tr>
<tr>
<td>Diane Knight, 350 Student Union I</td>
</tr>
<tr>
<td>University Development</td>
</tr>
<tr>
<td>Elizabeth Carlson Dahlin, Vice President, 4520 Roberts Road</td>
</tr>
<tr>
<td>Veterans Services</td>
</tr>
<tr>
<td>Carol A. Eilstad, 354 Student Union I</td>
</tr>
</tbody>
</table>

http://catalog.gmu.edu
Index

Academic calendar, 2
Academic dismissal, 24
Academic load
  full-time, part-time, 22
Academic testing, 19
Accounting, faculty, 45
Accounting courses: ACCT, 46
Accounting, M.S., 45
Accreditation, 8
Activities, student, 42
Adding a course, 23
Admission, 18
  change in field, 20
  international students, 19
  offer of, 19
  policy, 18
  readmission, 20
  requirements, 18
  summer session, 21
  second master’s degree, 19
  termination of, 20
Advancement to candidacy, 28
Advising, 21
Alcoholic beverages, 183
American Society of Cybernetics/The Cybernetics Center, 13
American Studies courses: AMST, 177
Appeals, 25
Application for admission
  deadlines, 18
  deferred, 20
Application for degree
  doctoral, 29
  master’s, 26
Applied and Engineering Physics, M.S., 151
Art History courses: ARTH, 177
Art Studio courses: ARTS, 178
Astronomy course: ASTR, 151
Auditing a course, 23

Bicycles/Skateboards, 184
Bilingual/Multicultural Education, 81
Biology, 47
  courses: BIOL, 49
  faculty, 47
Biology, M.S., degree requirements, 48
Business Administration, 53
  courses:
    ACCT, 46
    BULE, 55
    DESC, 55
    FNAN, 56
    IRM, 57
    MGMT, 58
    MKTG, 59
    degree requirements, M.B.A., 54
    faculty, 53
Business Administration, M.B.A., 54
Business Legal Studies courses: BULE, 55

Calendar, 1
Career Services, 41
Center for Behavioral and Cognitive Studies, 13
Center for Bilingual/Multicultural Teacher Preparation, 13
Center for Conflict Resolution, 13
Center for Economic and Social Education, 13
Center for Government, Society, and the Arts, 13
Center for Health Promotion, 13
Center for Interactive Educational Technology, 14
Center for Interactive Management, 14
Center for Middle East Studies, 14
Center for Productive Use of Technology, 14
Center for Real Estate and Land Use Analysis, 14
Center for Robotics and Control, 14
Center for Study of Public Choice, 14
Center for the Beginning Teacher Assistance Program (BTAP), 13
Center for the Study of Constitutional Rights, 14
Center for the Study of Market Processes, 14
Certificates, 174
Challenge of grade, 24
Change of grade, 24
Character Recognition Center, 14
Checks, 35
Chemistry, 60
  M.S., 60
  courses: CHEM, 60
Citizens Applied Research Institute, 14
Commencement
  doctoral degree recipients, 29
  master’s degree recipients, 27
Communication courses: COMM, 178
Computer and Electronics Engineering, 62
  faculty, 62
Computer and Electronics Engineering, M.S., 62
Computer Science, 67
  courses: CS, 68
  faculty, 67
Computer Science, M.S., 68
  degree requirements, 68
Computer system, 7
Conduct, 183
Conflict Management, 71
  courses: CONF, 71
  faculty, 71
Conflict Management, M.S., 71
Counseling Center, 40
Course symbols, 11
Course approval form, 21
Course numbering, 11
Courses at other institutions, 25
Creative Writing, M.F.A., 102
Credit, transfer of, 25
Curriculum and Instruction
  faculty, 78
190  Campus Map, Telephone Directory, and Index

Dance courses: DANC, 180
Decision Sciences courses: DESC, 55
Deferred Payment Plan, 34
Degree application
doctoral, 29
master’s, 26
Degree requirements
doctoral, 27
master’s, 25
Disabled persons, services to, 40
Dismissal, academic, 24
Dissertation, doctoral, 28
Doctoral
advancement to candidacy, 28
commencement exercises, 29
degree application, 29
degree requirements, 27
dissertation, nondissertation, 28
final examination, 28
guide for preparing dissertations and projects, 28
program of study, 28
research skill requirements, 28
residence, 27
supervisory committee, 27
time limit, 27
Domicile, legislation, 35
Dropping a course, 23
Drug and Alcohol Policy, 183

Economics, 73
courses: ECON, 75
faculty, 73
Economics, M.A., 73
Economics, Ph.D., 74
Education
courses:
EDAS, 98
EDCI, 85
EDGC, 98
EDRD, 87
EDSE, 88
EDUC, 89
Education, D.A.Ed., 93
Interdisciplinary courses: DAED, 94
Education, M.Ed. programs, 78, 95
degree requirements, 78
general, 94
counseling and development, 96
in administration and supervision, 95
in elementary education, 79
in reading, 82
in secondary education, 79
in special education, 83
Educational Centers, 13
Educational Leadership and Human Development
faculty, 95
Educational Study Center, 15
Electrical and Computer Engineering Courses:
ECE, 64
Electronics Engineering. See Computer and Electronics Engineering
Electron Microscopy Laboratory, 49
Elementary Education, 79
Engineering Physics. See Applied and Engineering Physics
English, 100
courses: ENGL, 103
faculty, 100
English, M.A., degree requirements, 101
linguistics, 102
English, M.F.A., degree requirements, 102
English Language Institute, 15
Entrepreneurship Center, 15
Environmental Biology–Public Policy, Ph.D.,
degree requirements, 48
Examinations, final, 23
Extended Studies enrollment, 20

Faculty Writing Project, 15
Failure to meet financial obligations, 35
Federal assistance programs, 36
Federal Theatre Project Collection, 15
Fees
application, 18
doctoral degree, application, 29
graduation, 27
readmission, 20
special registration, 28
summer session, 21
final examination policy, 23
Finance courses: FNAN, 56
Financial Planning and Resources Office, 36
Financial suspension, 35
Firearms, regulations, 184
Foreign language requirement, master’s, 26
Foreign Languages and Literatures, 107
courses: FRLN, 108
faculty, 107
French courses: FREN, 109

Geographic and Cartographic Sciences, 111
courses: GECA, 111
faculty, 111
Geographic and Cartographic Sciences, M.S., 111
degree requirements, 111
Geology courses: GEOL, 180
George Mason Institute of Science and Technology, 15
George Mason University Faculty Writing Project
(FWP), 15
George Mason University Press, 8
German courses: GERM, 109
Gerontology, certificate program, 174
Government and Politics courses: GOVT, 166
Grading system, 23
change of grade, 24
grade point average, 23
reports, 24
Graduate Management Admission Test: GMAT, 19
Graduate Record Examination (GRE), 19
Graduate School Foreign Language Tests (GSFLT), 19
Graduation fees, 27
Guaranteed Student Loan Program, 36
Guest Matriculant, 20
Guidance and counseling, 40
Health Education, 113
courses: HEAL, 114
faculty, 113
Health Education, M.Ed., 113
Health Insurance and Dental Plan, 40
History Research Center, 15
History, 115
courses: HIST, 116
faculty, 115
History, M.A., 115
Holbert L. Harris Theatre, 138
Honor Code, 29
Honor Committee, 29
Housing, 36, 40
Human Resource Development Program, 131
Identification card, 22
Incomplete grade, 23, 24
Indochina Institute, 15
Information Management and Expert Systems, certificate program, 174
Information Resource Management courses: IRM, 57
Information Systems and Systems Engineering, 119
courses: INFS, 122
faculty, 119
Information Systems, M.S., 119
Information Technology, 124
courses: INFT, 127
Ph.D. program, 125
In Progress Grade, 23, 24
Institute for Cross-Cultural Understanding, 15
Institute for Humane Studies, 15
Institute for Information Technology, 15
Institute on the Federal Theatre Project and New Deal Culture, 15
Interdisciplinary Studies, 131
faculty, 131
Individualized studies, 131
liberal studies, 132
master of arts (M.A.I.S.), 131
International Student Services, 42
International students admission of, 19
Test of English as a Foreign Language (TOEFL), 19
visa, 19
Law and Economics Center, 16
Law, School of, 8
Libraries and special collections, 7
Management courses: MGMT, 58
Marketing courses: MKTG, 59
Master of Education Programs, M.Ed., 78, 95
Master's commencement exercises, 27
degree application, 26
degree requirements, 25
foreign language requirement, 26
residence, 26
time limit, 26
transfer of credit, 25
Mathematical Sciences
courses: MATH, 134
faculty, 133
Mathematics, M.S., 133
Metropolitan Area Assessment Center, 16
Metro Campus Professional and Conference Center, 8
Minority Student Services, 41
Motor Vehicles
Policy, 183
Fees, 36
Music, 137
courses: MUSI, 138
faculty, 137
Music, M.A., 137
Nondegree status, 18, 24
Nonthesis option, 26
Northern Virginia, 8
Northern Virginia Cooperative Graduate Engineering Program, 176
Northern Virginia Regional Center for the Beginning Teacher Assistance Program (BTAP), 13
Northern Virginia Writing Project, 16
Nursing, 140
accreditation, 140
certificate in international nursing, 175
certificate in nursing administration, 175
certificate in nursing education, 175
continuing education, 176
courses: NURS, 142
faculty, 140
Nursing, M.S.N., 140
degree requirements, 140
Nursing Administration, D.N.Sc. in, 141
Operations Research and Applied Statistics, 145
courses: OR, 146
courses: STAT, 147
faculty, 145
Operations Research and Management Science, M.S., 145
Parking, See Motor Vehicles
Performing arts, 42, 137
Perkins Loan, 36
Pets, 184
Philosophy and Religious Studies courses: PHIL, 180
Photographic collections, 8
Physical Education, 149
courses: PHED, 150
faculty, 149
Physical Education, M.S., 149
Physics, 151
Applied and Engineering Physics, M.S., 151
courses: ASTR, 151
PHYS, 152
faculty, 151
Privacy of student information, 22
Privacy of student records, 183
Program of study, 28
Project for the Study of Young Children, 16
Provisional status, 18
Psychology, 153
courses: PSYC, 157
faculty, 153
Psychology, M.A., 154
Psychology, Psy. D., 155
Psychology Clinic, 16
Public Administration, 162
courses: GOVT, 166

http://catalog.gmu.edu
PUAD, 166
PUAF, 166
Public Administration, D.P.A., 164
Public Administration, M.P.A., 162
degree requirements, 162
Public Affairs course: PUAF, 166
Public Management Institute, 16

Rare Books, 8
Reading, 82
Readmission, 20
Records maintenance and disposal, 20
Refunds, 35
Registration, 21
Repeating a course, 23
Request forms, 25
Research skill requirements, 28

Satisfactory performance, 23, 24
Schedule of Classes, 21
School Counseling, 97
School of Law, 8
Secondary Education, 79
Secondary Education Certification Program, 80
Self-Care Institute, 16
Senior citizens enrollment, 21
Small Business Development Center, 16
Smoking, 184
Sociology, 169
courses: SOCI, 170
faculty, 169
Sociology, M.A., 170
Solicitors and salesmen, 184
Spanish courses: SPAN, 110
Special registration fee, 28
Statistics courses: STAT, 147
Student activities, 42
Student Health Services, 40
Student information, 22
Student Organizations, 42
Student requests and appeals, 25
Student Unions, 40
Student visa, 19
Summer Session, 4
Supervisory committee, 27
Supplemental Loan Program (SLS), 37
Systems Engineering
courses: SYST, 123
faculty, 119
Systems Engineering, M.S., 121

Teacher certification, 80
Teacher Education Programs,
accreditation, NCATE, 78
Teaching of English as a Second Language (TESL),
certificate program, 174
Termination of admission, 20
Test of English as a Foreign Language
(TOEFL), 19
Testing, 19
Thesis, master’s, 26
committee, 26
guide for preparing, 26
nonthesis option, 26

Time limit
doctoral, 27
master’s, 26
Transfer of credit, 25
criteria for, 25
Tuition and fees, 34

University Computing Services, 7
Veterans Services, 37, 41
Virginia programs for state residents, 37
Visiting the campuses, 8
Vocational Education, 82
Withdrawal
from a semester, 23
voluntary, enforced, 23
Writing Research Center, 16
George Mason University

Request for Application/Information

Name ____________________________
Address __________________________
City ____________________________ State _______ Zip ________

Please send me an application for graduate studies in the following:

Degree/Program ____________________________

Specialization ____________________________

Check if you are an international student on F or J Visa: □ Yes □ No
Check if you have not yet received a Graduate Catalog: □ Yes □ No

To receive an application for admission, please write or call:

Admissions Office
117 Finley Building
4400 University Drive
Fairfax, Virginia 22030-4444
(703) 323-2100

To receive an application for admission, please write or call:

Admissions Office
117 Finley Building
4400 University Drive
Fairfax, Virginia 22030-4444
(703) 323-2100

http://catalog.gmu.edu