

## Chapter 7

# Departments and Campus-wide Programs

## ACCOUNTING

For information, consult the Robert H. Smith School of Business entry in chapter 6.

## AEROSPACE ENGINEERING (ENAE)

### A. James Clark School of Engineering

3181 Glenn L. Martin Hall, (301) 405-2376  
[www.enaе.umd.edu](http://www.enaе.umd.edu)

Professor and Chair: Fournеy  
 Professors: Celi, Chopra, Lee, Leishman, M. Lewis, Schmitz  
 Associate Professors: Akin, Baeder, Barlow, Pines, Sanner, Vizzini, Wereley, Winkelmann, Yu  
 Assistant Professors: Atkins, Cadou, Shapiro  
 Visiting Associate Professor: Flatau  
 Visiting Professor: Bowden, Korkegi  
 Adjunct Professors: Elias, Zien, R. Lewis  
 Lecturers: Carignan, Healy, Keller, Van Wie  
 Emeritii: Anderson, Jones

### Department Mission Statement

The mission of the Department of Aerospace Engineering is, (1) to provide the highest quality education in state-of-the-art aerospace engineering principles and practices at undergraduate and advanced degree levels and through continuing education programs for practicing engineers, (2) to conduct research that will significantly advance the state of knowledge in the aerospace sciences and technologies, (3) to advance aerospace engineering practice and education through publications in the engineering and educational literature and through close relations with industry, government and other academic institutions, (4) to contribute to the advancement of the College of Engineering, the University of Maryland, and the state of Maryland.

### The Major

Aerospace engineering is concerned with the processes, both analytical and creative, that are involved in the design, manufacture and operation of aerospace vehicles within and beyond planetary atmospheres. These vehicles range from helicopters and other vertical takeoff aircraft at the low-speed end of the flight spectrum, to spacecraft traveling at thousands of miles per hour during launch, orbit, transplanetary flight, or reentry, at the high-speed end. In between, there are general aviation and commercial transport aircraft flying at speeds well below and close to the speed of sound, and supersonic transports, fighters, and missiles which cruise supersonically. Although each speed regime and each vehicle poses its special problems, all aerospace vehicles can be addressed by a common set of technical specialties or disciplines.

The subdisciplines of Aerospace Engineering are: aerodynamics, flight dynamics, propulsion, structures, and "design". Aerodynamics addresses the flow of air and the associated forces, moments, pressures, and temperature changes. Flight-dynamics addresses the motion of the vehicles including the trajectories, the rotational dynamics, the sensors, and the control laws required for successful accomplishment of the missions. Propulsion addresses the engines which have been devised to convert chemical (and occasionally other forms) energy into useful work, to produce the thrust needed to propel aerospace vehicles. Structures addresses material properties, stresses, strains, deflection, and vibration along with

manufacturing processes as required to produce the very light weight and rugged elements needed in aerospace vehicles. Aerospace "design" addresses the process of synthesizing vehicles and systems to meet defined missions and more general needs. This is a process that draws on information from the other subdisciplines while embodying its own unique elements.

The Aerospace Engineering program is designed to provide a firm foundation in the various subdisciplines. The Aerospace Engineering Department has facilities to support education and research across a range of special areas. There are subsonic wind tunnels with test sections ranging from a few inches up to 7.75 feet by 11.00 feet as well as a supersonic tunnel with a 6 inch by 6 inch test section. There are a number of structural test machines with capabilities up to 220,000 pounds for static loads and 50,000 pound for dynamic loads. There are experimental facilities to test helicopter rotors in hover, in forward flight, and in vacuum to isolate inertial loads from aerodynamic loads. There is an anechoic chamber for the investigation of noise generated by helicopters, and an autoclave and other facilities for manufacturing and an x-ray machine for inspecting composite structures. There is a neutral buoyancy facility for investigating assembly of space structures in a simulated zero gravity environment which is supported by robots and associated controllers.

There are many personal computers and workstations that provide local computing capability and extensive network access to campus mainframes, supercomputing centers, and all the resources of the Internet including the World Wide Web.

### Requirements for Major

	Semester Credit Hours	
	I	II
<b>Freshman Year</b>		
CHEM 135—General Chemistry.....	3	
PHYS 161—General Physics I .....		3
MATH 140, 141—Calculus I, II .....	4	4
ENES 100—Introduction to Engineering Design .....	3	
ENES 102—Statics.....		3
ENAE 100—The Aerospace Engineering Profession .....	1	
ENAE 202—Computer Languages .....	3	
CORE Program Requirements .....	3	3
<b>Total Credits .....</b>	<b>14</b>	<b>16</b>

	Semester Credit Hours	
	I	II
<b>Sophomore Year</b>		
MATH 246—Differential Equations .....		3
ENES 220—Strength of Materials .....	3	
MATH 241—Calculus III .....	4	
PHYS 262, 263—General Physics II,III.....	4	4
ENAE 261—Aerospace Analysis and Computation .....	3	
ENES 221—Dynamics .....	3	
ENAE 283—Fundamentals of Aeronautical Systems .....	3	
CORE Program Requirements .....	3	3
<b>Total Credits .....</b>	<b>17</b>	<b>16</b>

	Semester Credit Hours	
	I	II
<b>Junior Year</b>		
ENME 232—Thermodynamics .....	3	
ENAE 301—Dynamics of Aerospace Systems.....	3	
ENAE 311—Aerodynamics I .....	3	
ENAE 324—Aerospace Structures I.....		4
ENAE 362—Aerospace Instrumentation and Experiments.....	3	
ENAE 432—Control of Aerospace Systems .....	3	
ENGL 393—Technical Writing .....	3	
CORE Program Requirements.....	3	3

**AERONAUTICAL TRACK:**

ENAE 414—Aerodynamics II .....3

**SPACE SYSTEM TRACK:**

ENAE 404—Space Flight Dynamics .....3

**Total Credits** .....15 .....16

**Senior Year**

	I	II
ENAE 423—Vibration & Aeroelasticity .....	3	
ENAE 464—Aerospace Engineering Lab .....		3
CORE Program Requirements or Electives .....	3	3
General Elective .....		3
Aerospace Elective .....		3
Technical Elective .....		3

**AERONAUTICAL TRACK:**

ENAE 403—Aircraft Flight Dynamics .....3

ENAE 455—Aircraft Propulsion & Power .....3

ENAE 481—Principles of Aircraft Design .....3

ENAE 482—Aeronautical System Design ..... 3

**SPACE SYSTEM TRACK:**

ENAE 441—Space Navigation & Guidance .....3

ENAE 457—Space Propulsion & Power .....3

ENAE 483—Principles of Space Systems Design .....

ENAE 484—Space Systems Design.....3

**Total Credits** .....15 .....15

**Aerospace Electives**

Students must select a track. All courses in either the Aeronautical or the Space Systems track must be completed. Students in either track who wish to gain a broader education across the aeronautical and space application areas can take courses required in the other track as electives.

The Department offers a range of other electives. The following courses have recently been offered as electives for the undergraduate program

ENAE 415—Helicopter Theory .....	3
ENAE 416—Viscous Flow & Aerodynamic Heating.....	3
ENAE 424—Design & Manufacture of Computer Prototypes	
ENAE 425—Mechanics of Composite Structures .....	3
ENAE 426—Computer-Aided Structural Analysis and Design .....	3
ENAE 471—Aircraft Flight Testing .....	3
ENAE 488B—Intro to Computational Fluid Dynamics .....	3
ENAE 488C—Aerospace Computer Aided Design .....	3
ENAE 488J—Helicopter Aerodynamics .....	3
ENAE 488M—High Speed Aerodynamics .....	3
ENAE 488P—Product Design .....	3
ENAE 488R—Hybrid Rocket Design .....	3
ENAE 488W—Design of Remotely Piloted Vehicles .....	3
ENAE 499—Elective Research (Repeatable to 6 credits)	

The Aerospace Elective is either ENAE 398 or a 400 level ENAE course in addition to the student's chosen track sequence. The General Technical Elective must be a 300 or 400 level course outside of the department. Only one of either ENAE 398, a 488 project course or 499 may be used for these electives.

Minimum Degree Credits: The fulfillment of all Department, School, and University requirements. Approximately 124 credits are required for an Aerospace Engineering degree.

**Honors Program**

Academically talented students will be invited to participate in the Aerospace Honors program. Honors sections of ENAE 283, ENAE 311, ENAE 423 are offered as part of this program, in addition to an honors research project, ENAE 398.

**Admission**

Admission requirements the same as those of other Engineering Departments. Please consult Chapter 1.

**Advising**

Advising is mandatory. Each student is assigned to one of the full time faculty members who must be consulted and whose signature is required on the request for course registration each semester. The list of advisor assignments is available in the main office, (301) 405-2376.

**Cooperative Education Program**

Participation in the Cooperative Education Program is encouraged. See Chapter 1 for details.

**Financial Assistance**

The Department offers eight Glenn L. Martin merit-based scholarships and the Robert Rivello Scholarship. Space Systems Laboratory, Departmental and Alfred Gessow merit-based Scholarships are available as well.

**Scholarships and Awards**

The Department offers the following awards: Academic Achievement Award for highest overall academic average at graduation; R.M. Rivello Scholarship Award for highest overall academic average through the junior year; Sigma Gamma Tau Outstanding Achievement Award for scholarship and service to the Student Chapter; American Helicopter Society Outstanding Achievement Award for service to the student chapter; American Institute of Aeronautics and Astronautics Outstanding Achievement Award for scholarship and service to the student chapter.

**Student Organizations**

The Department is home to student chapters of the American Institute of Aeronautics and Astronautics and the American Helicopter Society, and the Sigma Gamma Tau honorary society. Aerospace Engineering students are also frequent participants in student activities of the Society for Advancement of Materials and Process Engineering.

**AFRICAN AMERICAN STUDIES PROGRAM (AASP)**

**College of Behavioral and Social Sciences**

2169 Lefrak Hall, (301) 405-1158

[www.bsos.umd.edu/aasp/](http://www.bsos.umd.edu/aasp/)

Chair and Professor: F. Dadoo

Associate Professors: S. Harley, E. Wilson\* (GVPT), F. Wilson

Assistant Professor: J. Nembhard, C. Woods

Instructor: M. Chateauvert

\*Joint appointment with unit indicated.

The African American Studies Program offers an interdisciplinary bachelor of arts degree in the study of the contemporary life, history, and culture of African Americans. The curriculum emphasizes the historical development of African American social, political, and economic institutions, while preparing students to apply analytic, social science skills in the creation of solutions to the pressing socio-economic problems confronting African American communities.

Two program options lead to the Bachelor of Arts degree. Both require a 15-credit core of course work that concentrates on African American history and culture.

**The Cultural and Social Analysis Concentration** provides a broad cultural and historical perspective. This concentration requires 18 additional credit hours in one or more specialty areas within African American Studies such as history, literature, government and politics, sociology or anthropology, as well as a departmental seminar.

**The Public Policy Concentration** provides in-depth training for problem solving in minority communities. It requires 21 additional credit hours in analytic methods, such as economics and statistics, nine credit hours of electives in a policy area (with departmental approval). Substantive areas of study include the family, criminal justice, employment, health care, discrimination, and urban development.

**Requirements for Major**

**Foundation courses:** AASP 100, 101 (formerly 300), 200, 202, 297 (formerly 299R).

**General Concentration Requirements:** In addition to the foundation course requirements, 18 credits of AASP upper-division electives (300-400 numbers), AASP 400 or AASP 402 and AASP 397 or AASP 386 and AASP 396.

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	<b>Semester Credit Hours</b>
CORE Liberal Arts and Sciences.....	43
AASP Foundation Courses: (total 15)	
AASP 100—Introduction to African American Studies .....	3
AASP 101 (Formerly 300)—Public Policy and Black Community .....	3
AASP 200—African Civilization .....	3
AASP 202—Black Culture in the United States .....	3
AASP 297—Research Methods .....	3
<b>Upper-Division Electives in African American Studies .....</b>	<b>18</b>

### Seminars

AASP400 or AASP 402—Classic Readings in African American Studies ...	3
AASP 397—Senior Thesis .....	3
AASP 386 and AASP 396 .....	6

**Public Policy Concentration Requirements:** In addition to the foundation courses, three credits of statistics; eight credits of elementary economics (ECON 200 and ECON 201); AASP 301, AASP 303, AASP 305; nine credits of upper-division AASP electives in the policy area (AASP numbers 499A-Z) or, with approval, elective courses outside of AASP; and AASP 397 or AASP 386 and AASP 396.

	<b>Semester Credit Hours</b>
CORE Liberal Arts and Sciences.....	43
AASP Foundation Courses: (total 12)	
AASP 100—Introduction to African American Studies .....	3
AASP 101 (Formerly 300)—Public Policy and the Black Community .....	3
AASP 200—African Civilization .....	3
AASP 202—Black Culture in the United States .....	3
AASP 297—Research Methods .....	3

### Analytic Component

STAT 100—Elementary Statistics and Probability	
OR SOCY 201—Introductory Statistics for Sociology	
OR Equivalent Statistics Course (Sophomore Year).....	3
AASP 301 (Formerly 428J).....	3
AASP 303 (Formerly 428P)—Computer Applications in African American Studies .....	3
AASP 305 (Formerly 401)—Theoretical, Methodological and Policy Research Issues in African American Studies .....	3
ECON 200—Principles of Microeconomics.....	4
ECON 201—Principles of Macroeconomics.....	4
One additional analytical skills course outside of AASP, with AASP approval.....	3

### Policy Electives in African American Studies .....

### Final Option:

1) AASP 397—Senior Thesis.....	3
2) AASP 386 and AASP 396 .....	6

Students must earn a grade of C (2.0) or better in each course that is to be counted toward completion of degree requirements. All related or supporting courses in other departments must be approved by an AASP faculty adviser.

## Honors Program

Academically talented undergraduates may enroll in the University Honors Program with a specialization in African American Studies. The Honors Program includes seminars and lectures presented by distinguished University of Maryland, College Park, faculty and guests. A reduced ratio of students to faculty ensures more individualized study. In addition, AASP majors with junior standing may petition to become individual honors candidates in African American Studies.

## BA/MPM Program

In this innovative joint program, candidates earn a bachelor's degree in African American Studies and a master's degree in public management after approximately five years. The BA/MPM is designed to integrate the study of the history, culture, and life of African Americans with technical skills, training, and techniques of contemporary policy analysis. The program also features a summer component that includes a lecture series, research opportunities, and special seminars.

## Admission into the BA/MPM program requires two steps:

### Undergraduate

- Students must major in the public policy concentration within the African American Studies program and maintain an overall GPA of 3.0 or greater.

### Graduate

- Students apply to the joint program after completing 81 credit hours of undergraduate work. Applicants must meet both University of Maryland, College Park graduate and School of Public Affairs graduate admission requirements.

## Eligibility

Freshmen or University of Maryland, College Park, students in good academic standing with fewer than 60 credits may apply to the BA/MPM program.

**Contact:** The African American Studies Program at (301) 405-1158 for application details.

## Options for Study with AASP

For students who major in other departments, the African American Studies Program offers three options for study:

- Students may obtain a certificate in African American Studies by completing 21 credit hours of course work.

For more information on the African American Studies Certificate, see the section on campus-wide programs later in this chapter

- Students may designate African American Studies as a double major, completing the major requirements for both AASP and another program.

- AASP can be a supporting area of student for majors such as Computer Science, Business, or Engineering.

## Scholarships and Financial Aid:

John B. and Ida Slaughter Scholarship

## Advising

Undergraduates in good academic standing may enroll in the African American Studies Program or obtain more information about available options and services by contacting the Undergraduate Academic Adviser, African American Studies Program, 2169 Lefrak Hall, University of Maryland, College Park, MD 20742, (301) 405-1158.

Course Code: AASP

## AGRICULTURAL SCIENCES, GENERAL (GNAS)

### College of Agriculture and Natural Resources

0115 H.J. Patterson (301) 405-1331  
Program Coordinator: D.S. Glenn dg11@umail.umd.edu  
Department Offices - 2102 Plant Sciences Building, (301) 405-4355  
[www.agnr.umd.edu/users/nrsl/](http://www.agnr.umd.edu/users/nrsl/)

Professor and Chair: Weismiller

Professors: Angle, Coale, Dernoeden, Fretz, R. Hill, James, Kenworthy, McIntosh\*, Miller, Mulchi, Ng, Quebedeaux, Rabenhorst, Solomos, Walsh, Weil  
Associate Professors: Beste, Bouwkamp, Carroll, Coleman, Costa, Deitzer, Everts, Glenn, Grybauskas, M. Hill, Lea-Cox, Ritter, Slaughter, J.B. Sullivan, J.H. Sullivan, Swartz, Turner, Vough

Assistant Professors: Chang, Dzantor, Kratochvil, Momen, Myers, Needelman

Instructors: Buriel, Nola, Steinhilber

Professor of the Practice: Cohan

Affiliate Professors: Kearney, Fiola

Adjunct Professors: Chappelle, Lee, Tamboli

Adjunct Associate Professors: Daughtry, Mallow, Meisinger, Montroll, Saunders, Van Berkum

Adjunct Assistant Professor: Pooler  
 Professors Emeriti: Aycok, Axley, Bandel, Clark, Decker, Fanning, Gouin, Hoyert, Kuhn, Link, McClurg, Miller, Oliver, Shanks, Stark, Thompson, Wiley  
 \*Distinguished Scholar-Teacher

**The Major**

The Department of Natural Resource Sciences and Landscape Architecture offers three undergraduate majors. Two lead to the Bachelor of Science (B.S.) degree; one in Natural Resource Sciences and the other in General Agriculture Sciences. The third major leads to a Bachelor of Landscape Architecture (B.L.A.) degree.

Agriculture is a complex subject, encompassing a range of scientific disciplines and professional fields. Majoring in General Agricultural Sciences does not require an agricultural background, as the curriculum gives students a broad overview of both plant and animal agriculture. This major is designed for students who are interested in a broad education in the field of agriculture. It is ideal for students who would like to survey agriculture before specializing, or for those who prefer to design their own program. To supplement classroom work, students in this major are encouraged to obtain summer positions that will provide technical laboratory or field experience in their chosen area. This program is administered by the Department of Natural Resource Sciences and Landscape Architecture.

**Curriculum in General Agricultural Sciences**

**GNAS Major**

<b>Requirements for Degree</b>	<b>Semester Credit Hours</b>
ANSC 101—Principles of Animal Science .....	3
ANSC or NRSC** .....	3
ANSC 314—Comparative Animal Nutrition .....	3
AREC 250—Elements of Agricultural and Resource Economics .....	3
AREC—** .....	3
BSCI 105—Principles of Biology I .....	4
BSCI 106—Principles of Biology II .....	4
BSCI—**Insect Pest Type Course .....	3
CHEM 103—General Chemistry I .....	4
CHEM 104—Fundamentals of Organic and Biochemistry, or CHEM 113—General Chemistry II and CHEM 233—Organic Chemistry I .....	4-8
ENBE 100—Basic Biological Resources Engineering Technology .....	3
ENBE 200—Fundamentals of Agricultural Mechanics .....	3
MATH 110 or higher (MATH 115 recommended) .....	3
NRSC 200—Fundamentals of Soil Science .....	4
NRSC 410—Principles of Plant Pathology or ANSC 412—Introduction to Diseases of Animals .....	4
PLSC 101—Introductory Crop Science .....	4
PLSC—** .....	3
SOCY 305—Scarcity and Modern Society .....	3
Community Development Related, Non-Agricultural Life Science, Biometrics, Computer, or Accounting .....	6
CORE and General Agricultural Program Requirements .....	91-100
Electives (18 credit hours at 300-level or above) .....	20-29

\*\*Student may select any course(s) having required hours in the area indicated

**AGRICULTURAL AND RESOURCE ECONOMICS (AREC)**

**College of Agriculture and Natural Resources**

2200 Symons Hall, (301) 405-1293  
 E-mail: arecuinfo@umail.umd.edu  
[www.arec.umd.edu](http://www.arec.umd.edu)

Professor and Chair: Gardner††  
 Professors: Bockstael, Chambers, Hardie, Hueth, Just††, Lichtenberg, List, Lopez, McConnell, Musser, Nerlove, Olson  
 Associate Professors: Alberini, Hanson, Horowitz, Leathers, Lipton, Lynch, Parker, Wade  
 Assistant Professors: Haigh, Melkonyan  
 Emeriti: Bender, Brown, Cain, Foster, Moore, Stevens, Strand, Tuthill, Wysong  
 ††Distinguished University Professor

Agricultural and Resource Economics majors complete a set of prerequisite courses, a core of classes offered by the Agricultural and Resource Economics Department, and one or more fields comprised of selected courses from outside the department. The core includes courses in economic reasoning, agribusiness management, environmental and resource policy, agricultural policy, economic development, and analytical methods. The program permits students flexibility in choosing fields to fit their career interests. Majors must complete one and should complete two fields. The curriculum balances breadth and depth, and lets students develop academic skills in two or more areas. The program provides a good foundation for careers in economics, resource or environmental policy, agribusiness, and international agriculture.

**Advising**

Because the program is flexible, advising is mandatory. Appointments may be made in Room 2200 Symons Hall, (301) 405-1291.

**Awards**

Scholarships honoring Arthur and Pauline Seidenspinner and Ray Murray are available. Contact a faculty adviser for more information, (301) 405-1291.

**Double Majors**

The department features a double major with Spanish for students interested in careers in multinational agribusiness firms or international agencies. It features a double major with Government and Politics for students interested in law school. Both can be completed within 120 credits. Other double majors are possible in consultation with an advisor.

**Requirements for Major**

<b>Prerequisite Courses</b>	<b>Semester Credit Hours</b>
ECON 200—Principles of Microeconomics .....	4
ECON 201—Principles of Macroeconomics .....	4
ECON 306—Intermediate Microeconomic Theory .....	3
ECON 321 (or BMGT 230)—Economic (or Business) Statistics .....	3
MATH 220 (or MATH 140)—Calculus .....	3
STAT 100 (or MATH 111)—Introduction to Probability .....	3

**Major Core Courses**

Seven of these courses must be successfully completed.

AREC 306—Farm Management .....	3
AREC 382—Computer Based Analysis in Agriculture and Natural Resources.....	3
AREC 404—Prices of Agricultural Products.....	3
AREC 405—Economics of Agricultural Production .....	3
AREC 427—Economics of Agricultural Marketing Systems .....	3
AREC 433—Food and Agricultural Policy .....	3
AREC 435—Commodity Futures and Options.....	3
AREC 445—Agricultural Development in the Third World .....	3
AREC 453—Economics of Natural Resource Use .....	3
AREC 455—Economics of Land Use .....	3
AREC 484—Introduction to Econometrics in Agriculture .....	3

**Fields**

All majors must complete one of the following fields. Two are strongly encouraged.

• **Business Management**

BMGT 220—Principles of Accounting I .....	3
BMGT 221—Principles of Accounting II .....	3
BMGT 340—Business Finance .....	3
BMGT 350—Marketing Principles and Organization .....	3
BMGT 364—Management and Organization Theory .....	3
BMGT 380—Business Law I .....	3

• **Farm Production**

PLSC 100 or PLSC 101—Intro. to Horticulture or Crop Science .....	4
ANSC 101—Principles of Animal Science .....	3

Four other courses in animal sciences, natural resource sciences and landscape architecture, chosen from a list of selected courses.

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### • Food Production

PHYS 117 (or PHYS 121) – Introduction to Physics .....	4
BSCI 105—Principles of Biology .....	4
NFSC 100—Elements of Nutrition .....	3
NFSC 112—Food Science & Technology .....	4
BSCI 223—Introduction to Microbiology .....	4
NFSC 430—Food Microbiology .....	2
NFSC 431—Food Quality Control .....	4
NFSC 398—Seminar in Food Science .....	1

### • Environmental and Resource Policy

ECON 381—Environmental Economics .....	3
ECON 454—Public Finance .....	3
Four other courses in biological sciences and chemistry, political science, natural resource management or geography, chosen from a list of selected courses.	

### • International Agriculture

ECON 305—Intermediate Macroeconomic Theory and Policy .....	3
ECON 315—Economics Development of Underdeveloped Areas .....	3
ECON 340/441—International Economics .....	3
BMGT 392—International Business Management.....	3
Two other courses in international agricultural production, chosen from a list of selected courses.	

### • Political Process

GVPT 100—Principles of Government and Politics .....	3
GVPT 170 – American Government .....	3
Four other courses in government and politics, chosen from a list of selected courses.	

### • Advanced Degree Preparation

ECON 407—Advanced Macroeconomics .....	3
ECON 414—Game Theory .....	3
ECON 422—Quantitative Methods in Economics I .....	3
ECON 423—Quantitative Methods in Economics II .....	3
Two other courses in mathematics or mathematical economics, chosen from a list of selected courses.	

### • Student Designed Field

This field requires a written proposal listing at least six courses totaling 18 or more credits. The proposal must be submitted to the Undergraduate Committee of the Agricultural and Resource Economics Department. Committee approval must be obtained 30 or more credit hours before graduation. A self-designed field may be used to study a foreign language as part of the AREC curriculum.

Course Code: AREC

## AGRONOMY (AGRO)

The Agronomy and Horticulture programs have been reorganized into a single major, Natural Resource Sciences (NRSC). See **Natural Resource Sciences** elsewhere in this chapter. (Note: Courses formerly offered as AGRO and HORT are now offered as NRSC and PLSC.)

## AMERICAN STUDIES (AMST)

### College of Arts and Humanities

1102 Holzapfel Hall, (301) 405-1354  
[amst.umd.edu/index.html](http://amst.umd.edu/index.html)

Professor and Chair: Caughey  
Professors: Kelly, Michel, Struna  
Associate Professors: Lounsbury, Mintz, Paoletti, Parks, Sies  
Visiting Assistant Professor: Conroy

### The Major

American Studies offers an interdisciplinary approach to the study of American culture and society, past and present, with special attention to the ways in which Americans, in different historical or social contexts, make sense of their experience. Emphasizing analysis and synthesis of diverse cultural products, the major provides valuable preparation for graduate training in the professions as well as in business, government, and museum work. Undergraduate majors, with the help of faculty advisers, design a program that includes courses offered by the American Studies

faculty, and sequences of courses in the disciplines usually associated with American Studies (i.e., history, literature, sociology, anthropology, art history, and others), or pertinent courses grouped thematically (e.g., Afro-American studies, women's studies, ethnic studies).

### Requirements for Major

Requirements for the American Studies major include a minimum of 45 upper-level credits completed and the foreign-language requirements of the College of Arts and Humanities. The major requires 45 hours, at least 24 of which must be at the 300-400 level. Of those 45 hours, 21 must be in AMST courses, with the remaining 24 in two 12 credit hour core areas outside the regular AMST departmental offerings. No grade lower than a C may be applied toward the major.

### Advising

Departmental advising is mandatory every semester for all majors.

### Distribution of the 45 hours

#### AMST Courses (21 hours required)

1. AMST 201/Introduction to American Studies (3): required of majors.
2. Three (3) or six (6) hours of additional lower-level course work.
3. AMST 330/Critics of American Culture (3): required of majors.
4. Six (6) or nine (9) hours of upper-level course work. No more than 6 hours of a repeatable number may be applied to the major.  
\*\*\*Students should take AMST 201 before taking any other AMST courses and will complete AMST 330 before taking 400-level courses.
5. AMST 450/Seminar in American Studies (3): required of majors.

### Core areas outside American Studies (24 hours required)

Majors choose two outside core areas of 12 hours each. At least one of the cores must be in a discipline traditionally associated with American Studies. The other core may be thematic. Upon entering the major, students develop a plan of study for the core areas in consultation with an adviser; this plan will be kept in the student's file. All cores must be approved in writing by an adviser.

### Traditional Disciplinary Cores

History, Literature, Sociology/Anthropology, Art/Architectural History.

### Interdisciplinary or Thematic Cores

Afro-American Studies, Women's Studies, Urban Studies, Popular Culture, Personality and Culture, Comparative Culture, Material Culture, Ethnic Studies, Business and Economic History, Folklore, Government and Politics, Education, Philosophy, Journalism.

Course Code: AMST

## ANIMAL SCIENCES (ANSC)

### College of Agriculture and Natural Resources

1415A Animal Sciences Center, (301) 405-1373  
E-mail: [ws31@umail.umd.edu](mailto:ws31@umail.umd.edu)  
[www.ansc.umd.edu](http://www.ansc.umd.edu)

### Department of Animal and Avian Sciences

Professor and Chair: Erdman  
Professors: Barao, Douglass, Harrell, Mather, Ottinger, Peters, Russek-Cohen, Varner, Vijay, Westhoff  
Associate Professors: Christman, Doerr, Hartsock, Kohn, Majeskie, Porter, Stricklin, Zimmermann  
Assistant Professors: Angel, Bequette, Estevez, Woods  
Instructor: Ordakowski  
Emeriti: Flyger, Heath, Mattick, Morris, Soares, Vandersall, Williams, Young  
Adjunct Professors: Allen, Howard, Paape, Raitner

## The Major

Animal Sciences prepares students for veterinary school, graduate school and careers in research, sales and marketing, aquaculture, and animal production. The curricula apply the principles of biology and technology to the care, management, and study of dairy and beef cattle, horses, fish, sheep, swine, and poultry. Students complete the Animal Sciences core courses and choose a specialization area: Animal Management and Industry, Avian Business, Laboratory Animal Management, and Sciences/Professional to prepare for admission to graduate, veterinary, or medical school. The Animal Sciences Center includes classrooms, lecture hall, social area, teaching labs, pilot processing plant, and animal rooms adjacent to a teaching farm where horses, sheep, swine, and cattle are maintained throughout the year.

### Requirements for Major

#### Required of All Students

#### Semester Credit Hours

CORE Program Requirements*	40
ANSC 101—Principles of Animal Science	3
ANSC 211—Animal Anatomy	4
ANSC 212—Animal Physiology	3
ANSC 314—Comparative Animal Nutrition	3
BSCI 105—Principles of Biology I	4
BSCI 106—Principles of Biology II	4
BSCI 222—Introductory Genetics	4
CHEM 103—General Chemistry I	4
CHEM 104—Fundamentals of Organic and Biochemistry	4
<b>OR</b>	
CHEM 113 and CHEM 233—General Chemistry II and Organic Chemistry I	
MATH 140 <b>OR</b> MATH 220	3
PHYS 121—Fundamentals of Physics	4
<b>OR</b>	
ENBE 100—Basic Agricultural Engineering Techniques	3
ECON 201—Principles of Macroeconomics	4
<b>OR</b>	
AREC 250—Elements of Agricultural and Resource Economics	3
BSCI 223—General Microbiology	4

\*Includes 16 required credits listed below

All students must complete 23 or 24 credits of additional course work listed in the area of specialization.

### Combined Degree Curriculum: Animal Sciences/ Veterinary Medicine

### Colleges of Agriculture and Veterinary Medicine

Students enrolled in the College of Agriculture and Natural Resources who have completed at least 90 credit hours, including all university and college requirements, may qualify for the Bachelor of Science degree from the University of Maryland, College of Agriculture and Natural Resources, upon successful completion in an accredited college of veterinary medicine of at least 30 semester hours. It is strongly recommended that students do not enter this program until their sophomore year and consult with the animal sciences undergraduate program coordinator.

### Combined Degree Requirements

CORE Program requirements*	40
ANSC 220—Livestock Management	4
ANSC 315—Applied Animal Nutrition	3
BSCI 105—Principles of Biology I	4
BSCI 106—Principles of Biology II	4
BSCI 222—Principles of Genetics	4
Mathematics (must include 3 credits of calculus)	6
CHEM 103—General Chemistry I	4
CHEM 113—General Chemistry II	4
CHEM 233—Organic Chemistry I	4
CHEM 243—Organic Chemistry II	4
PHYS 121—Fundamentals of Physics I	4
PHYS 122—Fundamentals of Physics II	4
Biochemistry	3
Electives	9

\*Includes 11 required credits listed above

For additional information, please contact the Associate Dean, VMRCVM, 1203 Gudelsky Veterinary Center, University of Maryland, College Park, MD 20742, (301) 314-6830.

## Advising

Advising is mandatory. Each student will be assigned to a faculty adviser to assist in planning his or her academic program. For information or appointment: 1415A Animal Sciences Center, (301) 405-1373.

## Scholarships and Awards

American Society of Animal Sciences Scholastic Recognition and Department of Animal Sciences Scholastic Achievement Awards are presented each year at the College of Agriculture and Natural Resources Student Awards Convocation. The ANSC program administers several scholarships, including: C.W. England, Dairy Technology Society, the Kinghorne Fund Fellowship, the C.S. Shaffner Award, the Lillian Hildebrandt Rummel Scholarship, and the Owen P. Thomas Development Scholarship. For eligibility criteria, visit the ANSC Office, 1415A Animal Sciences Center.

## Student Organizations

ANSC majors are encouraged to participate in one or more of the following social/professional student organizations. The Animal Husbandry Club, the University of Maryland Equestrian Club, the Veterinary Science Club, and the Poultry Science Club. For more information, visit the ANSC Undergraduate Studies Office, 1415A Animal Sciences Center.

Course Code: ANSC

## ANTHROPOLOGY (ANTH)

### College of Behavioral and Social Sciences

1111 Woods Hall, (301) 405-1423

[www.bsos.umd.edu/anth](http://www.bsos.umd.edu/anth)

Professor and Chair: Leone

Professors: Agar (emeritus), Chambers, Gonzalez (emerita), Jackson, Shackel, Whitehead, Williams

Associate Professor: Freidenberg

Assistant Professors: Paolisso, Stuart

Lecturers: Hall, London, Wilczak

Research Associate: Jones

Faculty Research Assistants: Larsen, Maloney, Reisinger, Reyes

Affiliate Faculty: Bolles (WMST), Caughey (AMST), Harrison (CMLT), Kim (WMST), Robertson (MUSC)

Adjunct Faculty: Crain (Adjunct Professor, LTG Associates), Fiske, McManamon (Adjunct Professor, National Park Service), Potter (Adjunct Professor, National Park Service), Puentes-Markides (Adjunct Professor, PAHO/WHO), Tashima (Adjunct Professor, LTG Associates)

## The Major

Anthropology, the study of culture, seeks to understand humans as a whole—as social beings who are capable of symbolic communication through which they produce a rich cultural record. Anthropologists try to explain differences among cultures—differences in physical characteristics as well as in customary behavior. Anthropologists study how culture has changed through time as the human genus has spread over the earth. Anthropology is the science of the biological evolution of human species, and the disciplined scholarship of the cultural development of human beings' knowledge and customary behavior.

Anthropology at the University of Maryland offers rigorous training for many career options. A strong background in anthropology is a definite asset in preparing for a variety of academic and professional fields, ranging from the law and business, to comparative literature, philosophy and the fine arts. Whether one goes on to a Master's or a Ph.D., the anthropology B.A. prepares one for a wide range of non-academic employment, such as city and public health planning, development consulting, program evaluation, and public archaeology.

## Academic Programs and Departmental Facilities

The Anthropology department offers beginning and advanced course work in the three principal subdivisions of the discipline: cultural anthropology, archaeology, and biological anthropology. Within each area, the department offers some degree of specialization and provides a variety of opportunities for research and independent study. Laboratory courses are offered in biological anthropology and archaeology. Field schools are offered in archaeology. The interrelationship of all branches of anthropology is emphasized.

## 86 Applied Mathematics and Scientific Computation Program

The undergraduate curriculum is tied to the department's Master in Applied Anthropology (M.A.A.) program; accordingly, preparation for non-academic employment upon graduation is a primary educational goal of the department's undergraduate course work and internship and research components.

The Anthropology department has a total of four laboratories, located in Woods Hall, which are divided into teaching labs and research labs. The department's two archaeology labs, containing materials collected from field schools of the past several years, serve both teaching and research purposes. The other two laboratories are a teaching laboratory in biological anthropology and the Laboratory for Applied Ethnography and Community Action Research.

All students have access to a 10-workstation IBM computer laboratory located at 1102 Woods Hall.

Cultural Systems Analysis Group (CuSAG), a research and program development arm of the department, is located in Woods Hall.

Center for Heritage Research Studies, located in the Department of Anthropology, focuses on research devoted to understanding the cultural characteristics of heritage and its uses.

### Requirements for Major

Majors are required to take five courses in the core course sequence (three introductory courses and two advanced method and theory courses), for a total of 16-17 credit hours. They must also take 15 credit hours in anthropology electives and 18 supporting credit hours, courses that are primarily outside the major. Anthropology majors must also acquire a second language or complete a quantitative methods course.

#### Required Courses:

- ANTH 220—Introduction to Biological Anthropology
- ANTH 240—Introduction to Archaeology
- ANTH 260—Introduction to Sociocultural Anthropology and Linguistics

**At least two of the following (one must be in major's area of primary focus-i.e., cultural anthropology, archaeology, biological anthropology):**

- ANTH 320—Method and Theory in Biological Anthropology
- ANTH 340—Method and Theory in Archaeology
- ANTH 360—Method and Theory in Sociocultural Anthropology

#### Quantitative Methods or Foreign Language Requirement:

- A) a quantitative methods course: 3 credit hours required—for a list of classes recommended for this requirement, see the Director for Undergraduate Studies; or
- B) Three or more terms of a foreign language, depending upon proficiency. Proficiency may be demonstrated in one of the following ways:
  - 1) successful completion of high-school level 4 in one language, or
  - 2) successful completion of a 12-credit sequence or of the intermediate level in college language courses, or
  - 3) successful completion of a placement examination at the above levels in one of the campus language departments offering such examinations

**Electives:** 15 credit hours in anthropology electives, 9 at the 300-level or above

**Supporting:** 18+ credit hours outside of the department (with your academic adviser's approval, 8 hours may be anthropology course work)

In addition to the above requirements, anthropology majors must meet the requirements of the College of Behavioral and Social Sciences, as well as the requirements of the university's general education program.

### Advising

Undergraduate advising is coordinated by the director of undergraduate studies who serves as the administrative adviser for all undergraduate majors and minors. All majors are required to meet with the director of undergraduate studies at least once per term, at the time of early registration. In addition, the Anthropology department encourages students to select an academic adviser who will work closely with the student to tailor the program to fit the student's particular interests and needs. All Anthropology faculty members serve as academic advisers (and should be contacted individually). Each major is expected to select an academic adviser from the faculty in the field of his/her concentration (Biological Anthropology, Socio-Cultural Anthropology, or Archaeology), and to consult

with him/her on a regular basis. The student's choice of a quantitative methods course must be approved by the student's adviser. For additional information, students should contact the Director of Undergraduate Studies, Dr. William Taft Stuart, 0106 Woods Hall, (301) 405-1435; E-mail: [wstuart@bss1.umd.edu](mailto:wstuart@bss1.umd.edu).

### Honors

The Anthropology department also offers an Honors Program that provides the student an opportunity to pursue in-depth study of his or her interests. Acceptance is contingent upon a 3.5 GPA in anthropology courses and a 3.0 overall average. Members of this program are encouraged to take as many departmental honors courses (either as HONR or as "H" sections of ANTH courses) as possible. The Honors Citation is awarded upon completion and review of a thesis (usually based upon at least one term of research under the direction of an Anthropology faculty member) to be done within the field of anthropology. Details and applications are available in the Anthropology Office, or from your departmental adviser.

### Student Organizations

Anthropology Student Association (ASA). An anthropology student association meets regularly to plan student events and to help coordinate various student and faculty activities. Meeting times are posted outside 0100 Woods Hall.

The department and the ASA jointly sponsor a public lecture series.

Course Code: ANTH

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## APPLIED MATHEMATICS AND SCIENTIFIC COMPUTATION PROGRAM

### College of Computer, Mathematical and Physical Sciences

3103 Mathematics Building, (301) 405-0924  
[www.amsc.umd.edu](http://www.amsc.umd.edu)

Director: Levermore

Faculty: More than 100 members from 19 units.

The Applied Mathematics and Scientific Computation Program is a graduate program in which the students combine studies in mathematics and application areas. All AMSC courses carry credit in mathematics. An undergraduate program emphasizing applied mathematics is available to majors in mathematics. Appropriate courses carry the MATH and STAT prefixes, as well as the AMSC prefix.

Course Code: AMSC

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## ARCHITECTURE

For information, see the School of Architecture, Planning and Preservation entry in chapter 6.

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## ART (ARTT)

### College of Arts and Humanities

1211-E Art/Sociology Building  
Undergraduate Program (301) 405-1445  
Graduate Program (301) 405-7790  
[www.inform.umd.edu/ARHU/Depts/Art](http://www.inform.umd.edu/ARHU/Depts/Art)

Chair: Ruppert

Undergraduate Director: Sham

Graduate Director: Craig

Professor Emerita: Truitt†

Professor Emeritus: Driskell††

Professors: DeMonte†, Fabiano, Lapinski, Ruppert, Sham

Associate Professors: Craig, Humphrey, Kehoe, Klank, Lozner, McCarty,

Richardson, Thorpe

Assistant Professor: Gavin, Morse

Instructor: Jacobs

Part Time: Tacha

†Distinguished Scholar-Teacher

††Distinguished University Professor

## The Major

The Department of Art is a place where students transform ideas and concepts into objects and visual experiences. It is an environment rich in art theory, criticism, and awareness of diverse world culture. Students are taught to articulate and refine creative thought and apply knowledge and skill to the making of images, objects, and experimental works. Courses are meaningful to students with the highest degree of involvement in the program and those who take electives. Students majoring in Art take a focused program of courses folded into a general liberal arts education offered by the university.

The diverse faculty of artists in the department strive to foster a sense of community through the common experience of the creative process, sharing their professional experience freely with students.

The areas of concentration within the major are design, drawing, painting, printmaking, and sculpture. Areas of study include papermaking, photography, art theory, and digital imaging. Internships and independent studies are also available.

### Requirements for Major

Undergraduate students are offered a Bachelor of Arts (B.A.) in Art. The requirements consist of a curriculum of 36 credits of art studio and art theory courses, and 12 additional credits of art history and art theory courses as a supporting area for a total of 48 major required credits. No course with a grade less than C may be used to satisfy major or supporting area requirements.

### Citation in Interdisciplinary Multimedia and Technology

16 credit hours. ARTT 354, ENGL 479, ARTT 689B and three additional relevant courses to be pre-approved by the Citation Director. Students who fulfill Citation requirements will receive a Citation on the official transcript. Please contact Prof. Brandon Morse, (301) 405-1462, bm154@umail.umd.edu, for more information.

### Advising

The name of the adviser for each class is available in the department office. Each second-semester sophomore and first-semester senior is required to see his or her adviser within the department. Additionally, each student is strongly encouraged to see his or her adviser in the department each semester.

### Honors Program

The honors option is available to Art majors for the purpose of creating opportunities for in-depth study and enrichment in areas of special and creative interest. To qualify, students must be Art majors with junior or senior status, a major G.P.A. of 3.2, and an overall G.P.A. of 3.0. The program requires a total of 12 credits in Honors course work. One course (3 credits) must be taken at the 300-level, and three courses (3 credits each) at the 400-level. There is a thesis component in one of the 400-level courses. Please consult the Honors Adviser for additional information.

### Fieldwork and Internship Opportunities

Students in the past have worked in a variety of internship settings. These have included assisting professionals complete public commissions, commercial or cooperative gallery and exhibition duties, and working in professional artists' workshops in the Baltimore and Washington, D.C. metropolitan areas. Additional information is available in the Department of Art office.

### Scholarships and Awards

The Department of Art administers eight Creative and Performing Arts Scholarships (CAPAs) that are available to freshman and entering transfer students for the Fall semesters. This is a merit-based scholarship that is awarded on a one-year basis, and may be renewed. Additional information is available in the main office of the department. The James P. Wharton Prize is awarded to the outstanding Art major participating in the December or May graduation exhibition. The Van Crews Scholarship is designated for outstanding Art majors concentrating in design. It is awarded for one year and is renewable. The David C. Driskell Award for the Outstanding Graduating Graduate Student is awarded at the end of the academic year.

## Student Art Exhibitions

The West Gallery (1309 Art/Sociology Building) is an exhibition space devoted primarily to showing students' art work, and is administered by undergraduate art majors assisted by a faculty adviser.

### Lecture Program

The Department of Art has a lecture program in which artists and critics are brought to the campus to explore ideas in contemporary art. A strong component of this program is devoted to diversity.

Course Code: ARTT

## ART HISTORY AND ARCHAEOLOGY (ARTH)

### College of Arts and Humanities

1211B Art/Sociology Building, (301) 405-1479  
[www.inform.umd.edu/ARHU/Depts/ArHistory](http://www.inform.umd.edu/ARHU/Depts/ArHistory)  
[www.inform.umd.edu/Archaeology](http://www.inform.umd.edu/Archaeology)

Chair: Hargrove

Professors: Eyo, Farquhar, Hargrove, Miller, Pressly, Promey, Wheelock

Associate Professors: Colantuono, Gerstel, Kelly, Kuo, Promey, Spiro, Venit, Withers

Assistant Professors: Kita, Kornbluth

### The Major

The faculty and students of the Department of Art History and Archaeology form a dynamic nucleus within a major research university. The program, leading to the B.A. degree in Art History and Archaeology, provides a diverse selection of courses in the art and archaeology of Africa, Asia, Europe, and the Americas. The goal of the department is to develop the student's critical understanding of visual culture in both art historical and archaeological contexts. The numerous teaching awards won by faculty members indicate the department's concern for excellence in undergraduate education. In addition to its fine undergraduate program, the department offers graduate studies leading to the M.A. and Ph.D. degrees.

The department has strong coverage in Western art from the Classical period up to the present. In addition, by taking advantage of the unusual diversity of faculty interests, students can study in areas not traditionally offered in departments of art history and archaeology, such as art and archaeology of Africa, art of diaspora cultures, art and archaeology of the Americas, Eastern European art, Asian art, and feminist perspectives on art. Grounding in art historical and archaeological theory and method is provided in a number of courses. Students are encouraged to supplement their art historical and archaeological studies with courses in other fields. Studies in archaeology may be pursued in cooperation with other University departments. Faculty fieldwork in Greece, Israel, Mexico, Nigeria, and the United States affords undergraduates valuable first-hand experience in archaeological methods and practice.

In addition to the university's excellent libraries, students can use the resources of the Library of Congress and other major area archives. The department is in the forefront of exploring digital imaging technologies for art historical and archaeological teaching, research, and publication.

The location of the university between Washington and Baltimore gives students the opportunity to use some of the finest museum and archival collections in the world for their course work and independent research. The department encourages students to hold internships at a number of these institutions. Curator/professors, exhibitions in the Art Gallery at the University of Maryland, interactive technologies, and the extensive use of study collections bring regional and distant museums into the classroom.

Close ties between the faculty and the undergraduate community are fostered through directed-study courses and undergraduate research assistantships. Selected students also gain valuable experience as undergraduate tutors for large lecture classes. The undergraduate Art History and Archaeology Association sponsors lectures, departmental gatherings, and field trips to museums on the East coast.

Requirements for the major in Art History are as follows: three ARTH courses (9 credits) at the 200 level; seven ARTH courses (21 credits) at the 300-400 level; either ARTT 100 or ARTT 110 (3 credits); a supporting area of four courses (12 credits) in coherently related subject matter outside the department of Art History and Archaeology at the 300-400

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level. No credit toward the major can be received for ARTH 100 or 355. No course with a grade lower than C may be used to satisfy major or supporting area requirements.

### Citation in Archaeology

15 credit hours. ARTH 494 and four courses from approved list of courses. Students who fulfill Citation requirements will receive a Citation on the official transcript. Please contact the Director of Undergraduate Studies for more information.

### Advising

Departmental advising is mandatory for all majors.

### Honors Program

Qualified majors may participate in the department's honors program, which requires the completion of ARTH 496 (Methods of Art History) and ARTH 499 (Honors Thesis). Consult a departmental adviser for details.

### Awards

The Department of Art History and Archaeology offers three undergraduate awards each year: the J.K. Reed Fellowship Award to an upper-level major and the George Levitine and Frank DiFederico Book Awards to seniors nearing graduation.

Course Code: ARTH

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## ASIAN AND EAST EUROPEAN LANGUAGES AND CULTURES (ARAB, CHIN, EALL, HEBR, JAPN, KORA, RUSS, SLAV)

### College of Arts and Humanities

2106 Jimenez Hall, (301) 405-4239

[www.languages.umd.edu/AsianEastEuropean](http://www.languages.umd.edu/AsianEastEuropean)

Professor and Chair: Ramsey

Professor: Brecht

Adjunct Professor: Li

Associate Professors: Chin, Gor, Hitchcock, Kerkham, Lekic, Martin

Assistant Professors: Branner, Jones, Liu, Papazian, Yotsukura, Zakim

Instructors: Levy, Miura, Sano, Shen, Yaginuma

Lecturers: Lee, Qi

**Departmental advising is mandatory for all second-semester sophomores and seniors.**

Students must take language-acquisition courses sequentially, i.e., 101, 102, 201, 202, etc. Once credit has been received in a higher-level language acquisition or grammar course, a lower-level course may not be taken for credit.

### Chinese Language and Literature

The Chinese major provides the training and cultural background needed for entering East Asia-related careers in such fields as higher education, the arts, business, government, international relations, agriculture, or the media. Students may also consider a double major in Chinese and another discipline, such as business, government and politics, economics, or journalism.

After completing the prerequisite of one year of language (12 credits): CHIN 101 (Elementary Chinese; six hours per week, fall); CHIN 102 (Elementary Spoken Chinese; three hours per week, spring); and CHIN 103 (Elementary Written Chinese; three hours per week, spring), students must complete 36 credits for the major course requirements (18 language, six civilization/history, 12 elective). No grade lower than C may be used toward the major.

Requirements for the Chinese major include the College of Arts and Humanities requirement of 45 upper-level credits completed. The College foreign-language requirement will automatically be fulfilled in the process of taking language major courses. Chinese students have the option of applying to live in St. Mary's Hall (Language House) and participating in a study-abroad program.

### Chinese Course Requirements

Language:

CHIN 201—Intermediate Spoken Chinese I (3)

CHIN 202—Intermediate Written Chinese I (3)

CHIN 203—Intermediate Spoken Chinese II (3)

CHIN 204—Intermediate Written Chinese II (3)

CHIN 301—Advanced Chinese I (3)

CHIN 302—Advanced Chinese II (3)

Civilization/History:

Option I:

HIST 284—East Asian Civilization I (3)

and

HIST 481—A History of Modern China (3)

or

HIST 485—History of Chinese Communism (3)

Option II:

HIST 285—East Asian Civilization II (3)

and

HIST 480—History of Traditional China (3)

Electives (300-level or above; 12 credits)

Note: Electives must be in Chinese language, literature, linguistics, or other East Asian subjects (one must be in the area of Chinese linguistics and one in the area of Chinese literature), and are subject to approval by the student's adviser.

### Business Option

Courses: CHIN 201-203; 202-204; 301-302; 411-412; 313 or 314 or 315; 421 or 422; HIST 284-481 or 485 or HIST 285-480 (36 credits). The following supporting courses are strongly recommended: CHIN 305-306; 401-402; 431-432.

### Citations

#### Citation in Chinese Language

15 credit hours. Five courses in Chinese from approved list of courses. Contact the Director of Undergraduate Studies for more information.

#### Citation in Chinese Studies

15 credit hours. Five courses from approved list of courses. Contact the Director of Undergraduate Studies for more information.

#### Citation in Business Management for Chinese Majors (1107B)

15 credit hours. ECON 200 and four courses from approved list of BMGT courses. Contact Business, Culture and Languages Program at (301) 405-2621 for more information.

#### Citation in Business Chinese

15 credit hours. Five courses in Chinese from approved list of courses. Contact Business, Culture and Languages Program at (301) 405-2621 for more information.

Students who fulfill Citation requirements will receive a Citation on the official transcript.

### Japanese Language and Literature

The Japanese major provides the training and cultural background needed for entering East Asia-related careers in such fields as higher education, the arts, business, government, international relations, agriculture, or the media. Students may also consider a double major in Japanese and another discipline, such as business, international relations, economics, or journalism.

After completing the prerequisite of one year of language (12 credits): JAPN 101 (Elementary Japanese I; six hours per week, fall); and JAPN 102 (Elementary Japanese II; six hours per week, spring), students must complete 42 credits for the major course requirements (24 language, six civilization/history, 12 elective). No grade lower than C may be used toward the major.

Requirements for the Japanese major include the College of Arts and Humanities requirement of 45 upper-level credits completed. The College foreign language requirement will automatically be fulfilled in the process of taking language major courses. Japanese students have the option of applying to live in St. Mary's Hall (Language House) and participating in a study-abroad program.

## Japanese Course Requirements

Language:

JAPN 201—Intermediate Japanese I (6)

JAPN 202—Intermediate Japanese II (6)

JAPN 301—Advanced Japanese I (6)

JAPN 302—Advanced Japanese II (6)

Civilization/History:

Option I:

HIST 284—East Asian Civilization I (3)

and

HIST 483—History of Japan Since 1800 (3)

Option II:

HIST 285—East Asian Civilization II (3)

and

HIST 482—History of Japan to 1800 (3)

Electives (300-level or above; 12 credits)

Note: Electives must be in Japanese language, literature, linguistics, or other East Asian subjects (one must be in the area of Japanese linguistics and one in the area of Japanese literature), and are subject to approval by the student's adviser.

## Supporting Courses for Chinese or Japanese

Students are strongly urged to take additional courses in a discipline relating to their particular field of interest, such as art, history, linguistics, literary criticism, or comparative literature. The range of supporting courses can be decided upon in consultation with the student's adviser.

## Business Option

Courses: JAPN 201-202; 301-302; 403-404; HIST 284-483 or 285-482 (36 credits). An additional six credits at the 300-400 level in electives in Japanese literature and linguistics are required.

## Citations

### Citation in Business Management for Japanese Majors (1108B)

15 credit hours. ECON 200 and four courses from approved list of BMGT courses.

### Citation in Business Japanese

15 credit hours. Five courses in Japanese from approved list of courses.

Students who fulfill Citation requirements will receive a Citation on the official transcript. Contact Business, Culture and Languages Program at (301) 405-2621 for more information.

## Russian Language and Literature

The undergraduate major in Russian Language and Literature consists of 39 hours beyond the basic language acquisition sequence (RUSS 101, 102, 201, 202). No course grade lower than C may be used to satisfy the major requirements. A common set of core courses is required of all majors, as well as nine hours of related course work. Students may want to consider a double major in Russian language and literature and another discipline, such as business, international relations, economics, or journalism. Russian students have the option of applying to live in St. Mary's Hall (Language House), and the majority of Russian majors participate in a study abroad program.

## Russian Course Requirements

Eight Courses (24 credits) from the following:

RUSS 210—Structural Description of Russian (3)

RUSS 211—Applied Russian Phonetics (3)

RUSS 301—Advanced Russian I (3)

RUSS 302—Advanced Russian II (3)

RUSS 303—Russian Conversation: Functional Skills (3)

RUSS 307—Commercial Russian I (3)

RUSS 321—Survey of Russian Literature I (3)

RUSS 322—Survey of Russian Literature II (3)

RUSS 401—Advanced Russian Composition (3)

RUSS 402—Practicum in Written Russian (3)

RUSS 403—Russian Conversation: Advanced Skills (3)

RUSS 404—Practicum in Spoken Russian (3)

Two Courses (6 credits) of all content-based courses taught in Russian:

RUSS 407-Commercial Russian II (3)

RUSS 409—Selected Topics in Russian Language Study (3)

RUSS 431—Russian Literature of the 19th Century I (3)

RUSS 432—Russian Literature of the 19th Century II (3)

RUSS 433—Russian Literature of the 20th Century (3)

RUSS 434—Soviet Russian Literature (3)

RUSS 439—Selected Topics in Russian Literature (3)

## Supporting Courses

An additional 9 credits from among the following to be chosen in consultation with an advisor; 6 credits must be at 300-400 level:

RUSS 221, 222, 281, 282, 298, 307, 327, 328, 329, 381, 382, 398, 405, 406, 407, 409, 410, 411, 439, 473. SLAV 469, 475, 479, 499.

## Business Option

Courses: RUSS 210 or 211; 301-302; 303; 401; 403; 405-406; 307-407; 381-382; 467, for a total of 39 credits. It is strongly recommended that the student earn eight credits (such as RUSS 301, 303, 403, 467) in the Summer Programs in the Plekhanov Institute in Moscow or the Moscow Institute of Finance.

## Citations

### Citation in Russian Language

15 credit hours. (For non-native students). Five courses from approved list of courses. Contact the Director of Undergraduate Studies for more information.

### Citation in Russian Language and Culture

15 credit hours. Requirements for non-native students: five courses from approved list of courses. Requirements for heritage/native speakers: five courses from approved list of courses. Contact the Director of Undergraduate Studies for more information.

### Citation in Business Management for Russian Majors (1106B)

15 credit hours. ECON 200 and four courses from approved list of BMGT courses. Contact Business, Culture and Language Program at (301) 405-2621 for more information.

### Citation in Business Russian

15 credit hours. Five courses in Russian from approved list of courses. Contact Business, Culture and Languages Program at (301) 405-2621 for more information.

Students who fulfill Citation requirements will receive a Citation on the official transcript.

## Arabic Language

The Arabic language program enables students to read and write Modern Standard Arabic (the language of radio, television, and newspapers throughout the Arab World), as well as to communicate with native speakers of Arabic. Two levels, elementary and intermediate, are offered. These courses develop students' knowledge of Arabic in reading, writing and speaking, while also introducing them to Arabic and Islamic culture.

## Hebrew Language

The Hebrew Language Program provides, both to beginners and to those with previous background, an opportunity to acquire knowledge and skills in Hebrew language, culture, and thought. Elementary and Intermediate level language courses develop effective communication skills in modern Hebrew. Upper-level language courses emphasize reading comprehension, vocabulary enrichment, and writing skills. More advanced students focus on the analytical study of major classical and modern Hebrew texts.

While there is no Hebrew major, students wishing to focus on Hebrew language as a primary subject may do so through a concentration on Hebrew within the Jewish Studies major (see Jewish Studies Program).

The University of Maryland sponsors a semester program at Tel Aviv University. Scholarships for study in Israel are available through the Meyerhoff Center for Jewish Studies. Hebrew students have the option of applying to live in St. Mary's Hall (Language House) and participating in a study-abroad program.

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### Korean

The Korean language program consists of two tracks. The first consists of KORA 101 and KORA 102 and is designed for students with no previous background in, or exposure to, Korean language and culture. The second track consists of KORA 211 and KORA 212. It is a heritage sequence for students who were exposed to Korean as children, but who do not have native fluency in the language. Students who wish to enroll in either track will need to be placed by the instructor. In addition to these four language skill courses, the department offers KORA 242, an introductory course on the structure of the Korean language, and KORA 241, a survey of the history of the Korean language.

#### Citation in Korean Studies

15 credit hours. Five courses from approved list of courses. Students who fulfill Citation requirements will receive a Citation on the official transcript. Please contact the Director of Undergraduate Studies for more information.

Course Codes: ARAB, CHIN, EALL, HEBR, JAPN, KORA, RUSS, SLAV

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## ASTRONOMY DEPARTMENT (ASTR)

### College of Computer, Mathematical, and Physical Sciences

1204 Computer and Space Sciences Bldg., (301)405-3001

E-mail: [astrgrad@deans.umd.edu](mailto:astrgrad@deans.umd.edu)

[www.astro.umd.edu](http://www.astro.umd.edu)

Chair: Mundy

Associate Director: Trasco

Professors: A'Hearn, Harrington, Kundu, Leventhal, Papadopoulos, Rose, Stone, Trimble, Vogel, Wilson

Associate Professors: Hamilton, Harris, Ostriker, Veilleux

Assistant Professors: McGaugh, Miller, Reynolds, Richardson

Instructors: Deming, Theison

Adjunct Professors: Gehrels, Holt, Mushotzky, White

Senior Research Scientists: Lisse, Sharma

Associate Research Scientists: Arnaud, Balachandran, Killen, McFadden, Milikh, Schmahl, White, Wolfire

Assistant Research Scientists: Bandler, Golla, Hewagama, Lanz, Loewenstein, Ng, Pound, Teuben

### The Major

The Astronomy Department offers courses leading to a Bachelor of Science in Astronomy as well as a series of courses of general interest to non-majors. Astronomy majors are given a strong undergraduate preparation in Astronomy, Mathematics, and Physics. The degree program is designed to prepare students for positions in government and industry laboratories or for graduate work in Astronomy or related fields. A degree in Astronomy has also proven valuable as preparation for non-astronomical careers.

### Requirements for Major

Astronomy majors are required to take a two-semester introductory Astronomy sequence: ASTR 120-121, an observing course ASTR 310 and an introductory Astrophysics course ASTR 320. Two additional 400-level Astronomy courses are also required.

Students majoring in Astronomy are also required to obtain a good background in Physics and in Mathematics. The normal required sequence is PHYS 171, 272, 273 and the associated labs PHYS 174, 275, 276. With the permission of the advisor, PHYS 161, 262, 263 and 174 can be substituted for this sequence. PHYS 374 and two additional 400-level Physics courses are required. Astronomy majors are also required to take a series of supporting courses in Mathematics. These are MATH 140, 141, 240, 241, and 246.

The program requires that a grade of C or better be obtained in all courses required for the major. Students planning to double major (or to seek a double degree) in Physics and Astronomy should note that this combination does not automatically satisfy CORE Advanced Studies. They should discuss the issue with their academic advisors to assure that their program meets all degree requirements.

Detailed information on typical programs and alternatives to the standard program can be found in the pamphlet entitled, "Department Requirements for a Bachelor of Science Degree in Astronomy" which is available from the Astronomy Department office.

### Facilities

The Department of Astronomy has joined with two other universities in upgrading and operating an mm wavelength array located at Hat Creek in California. Observations can be made remotely from the College Park campus. Several undergraduate students have been involved in projects associated with this array. The Department also operates a small observatory on campus. There are four fixed telescopes ranging in aperture from 20" to 7". There are also six portable 8" telescopes. Most of the telescopes now have CCD cameras and several are computer controlled. This facility is used extensively for undergraduate classes. An observatory Open House Program for the public is also run. Details are available from the Astronomy Department office.

### Courses for Non-Science Majors

There are a variety of courses that can be found in the department's offerings.

## The Major

This program is for students who wish to become engineers but who also have serious interest in biological systems and how the physical and biological sciences interrelate. The biological and the engineering aspects of plant, animal, genetic, microbial, medical, food processing, and environmental systems are studied. Graduates are prepared to apply engineering, mathematical, and computer skills to the design of biological systems and facilities. Graduates find employment in design, management, research, education, sales, consulting, or international service.

### Requirements for Major

Biological Resources Engineers can prepare themselves for a wide variety of careers. Each student has the opportunity to specialize by taking technical electives in their interest area. Biological and engineering technical electives are chosen in consultation with their Departmental Advisor. While individuals have chosen to specialize in areas ranging from aquacultural engineering to biomedical engineering to food engineering, four specific focus areas are supported by the Department.

### Bioenvironmental and Ecosystem Engineering

Bioenvironmental and Ecosystem Engineering is a focus area that concentrates on using principles of biological, environmental and engineering sciences to study the interacting processes necessary for a healthy environment. Students interested in this focus area need to strengthen their background in soils, ecosystem biology, natural resources, chemistry, fluids, hydrology, and pollution processes.

### Biomedical Engineering

Biomedical engineering is a focus area that examines the wide range of activities in which the disciplines of engineering and biological or medical science intersect. Representative areas include: design of diagnostic and therapeutic devices for clinical use; development of biologically compatible materials; physiological modeling; and many others.

### Biotechnological Engineering

Biotechnological Engineering is a focus area that applies scientific and engineering principles to the processing of materials by biological agents. Examples of products available as a result of biotechnology include antibiotics, vaccines, fuels such as ethanol, dairy products, and microbial pesticides.

### Pre-medicine/Pre-veterinary

The pre-professional program for pre-medical and pre-veterinary students advises students preparing to apply to graduate programs in these areas. The Departmental Advisors assist students in setting career objectives, and in selecting undergraduate course work to meet the admissions criteria of the professional schools. Advisors help students select proper chemistry and biological science required course sequences.

### Educational Objectives

The objective of the undergraduate Biological Resources Engineering program is to produce engineers with:

1. The ability to design products and processes related to biological systems.
2. The ability to communicate well, especially with engineers and non-engineering biological specialists.
3. The ability to work successfully in teams.
4. The ability to conceptually categorize information, especially biological information, in order to deal effectively with technical advances coming at a rapid pace.
5. Provide engineering education with a solid grounding in fundamentals that will have lifelong value.
6. Provide understanding of human behavior, societal needs and forces, and the dynamics of human efforts and their effects on the environment.

## Biological Resources Engineering Curriculum

### Freshman Year

ENES 100—Introduction to Engineering Design	3
*MATH 140—Calculus I	4
*CHEM 135—General Chemistry I	3
*BSCI 105—Principles of Biology I	4
ENBE 110—Intro. to Bio. Res. Engineering	1
<b>Total</b>	<b>15</b>

ENES 102—Statics	3
*MATH 141—Calculus II	4
*CHEM 136—General Chemistry II	1
*PHYS 161—General Physics	3
ENGL 101—Introduction to Writing	3
<b>Total</b>	<b>14</b>

### Sophomore Year

CHEM 233—Organic Chemistry	4
BSCI 223—General Microbiology	4
ENES 220—Mechanics of Materials	3
*PHYS 262—General Physics	4
<b>Total</b>	<b>15</b>

MATH 246—Differential Equations for Scientists and Engineers	3
ENME 232—Thermodynamics	3
ENBE 241—Computer Use in Bioresource Engineering	3
BSCI 230—Cell Biology and Physiology	4
*CORE1	3
<b>Total</b>	<b>16</b>

### Junior Year2

ENBE 453—Introduction to Biological Materials	3
ENBE 455—Basic Electronic Design	3
ENME 331—Fluid Mechanics	3
or ENCE 330—Basic Fluid Mechanics	
[MATH 241: Calculus III]	4
*CORE1	3
<b>Total</b>	<b>16</b>

ECON 200 or 201—Principles of Economics	4
or (approved substitute)	
ENBE 454—Biological Process Engineering	4
[BIOL SCI: Technical Elective]3	3
[ENGR SCI: Technical Elective]3	3
*CORE1	3
<b>Total</b>	<b>17</b>

### Senior Year

ENBE 471—Biological Systems Control	3
ENBE 422—Water Resources Engineering	3
or ENBE 456—Biomedical Instrumentation	3
ENBE 485—Capstone Design I	1
[BIOL SCI: Technical Elective]3	3
ENGL 393—Technical Writing	3
*CORE1	3
<b>Total</b>	<b>16</b>

ENBE 482—Dynamics of Biological Systems	1
ENBE 484—Biological Responses to Environmental Stimuli	3
ENBE 486—Capstone Design II	2
[ENGR SCI: Technical Elective]6	6
*CORE1	3
<b>Total</b>	<b>15</b>
<b>Total</b>	<b>124</b>

\*Satisfies General Education Requirements

<sup>1</sup>Students must consult with an advisor on selection of appropriate courses for their particular area of study.

<sup>2</sup>No 300-level and above courses may be attempted until 56 credits have been earned.

<sup>3</sup>Technical electives, related to field of concentration, must be selected from a departmentally approved list.

**Biological Sciences (BIOL SCI) technical electives** may be chosen, depending on students' interests, from an approved list of courses in the following programs: Animal Sciences, Chemistry/Biochemistry, Entomology, Nutrition and Food Science, Geography, Geology, Hearing and Speech, Health, Horticulture, Kinesiology, Meteorology, Microbiology, Natural Resources Management, Natural Resources Sciences, Plant Biology, Psychology, and Zoology.

## 92 Biological Sciences Program

**Engineering Sciences (ENGR SCI) technical electives** may be chosen, also depending on students' interests, from among the following programs: Aerospace Engineering, Biological Resources Engineering, Civil Engineering, Chemical Engineering, Electrical Engineering, Fire Protection Engineering, Mechanical Engineering, and Nuclear Engineering.

### Admission/Advising

All Biological Resources Engineering majors must meet admission, progress, and retention standards of the Clark College of Engineering, but may enroll through either the College of Agriculture and Natural Resources or the School of Engineering.

Advising is mandatory; call (301) 405-7357 or (301) 405-1198 to schedule an appointment.

Contact departmental academic advisors to arrange teaching or research internships.

### Financial Assistance

The department offers four scholarships specifically for Biological Resources Engineering majors. Cooperative education (work study) programs are available through the Clark School of Engineering. Part-time employment is available in the department, in USDA laboratories located near campus, and at other locations.

### Honors and Awards

Outstanding students are recognized each year for scholastic achievement and for their contribution to the department, college, and university. Top students are selected for Alpha Epsilon, the Honor Society of Biological Resources Engineering, and Tau Beta Pi, the engineering honor society.

### Student Organization

Join BRES, the Biological Resources Engineering Society. Academic advisors will tell you how to become a participant.

Course Code: ENBE

## BIOLOGICAL SCIENCES PROGRAM

### College of Life Sciences

1302 Symons Hall, (301) 405-6892  
[www.life.umd.edu](http://www.life.umd.edu)

Director: Associate Dean Infantino  
 Associate Director: Dr. Joelle Presson

### The Major

The Biological Sciences major is an interdepartmental program sponsored by the Departments of Entomology, Cell Biology and Molecular Genetics, and Biology. All Biological Sciences majors complete a common sequence of introductory and supporting courses referred to as the Basic Program. In addition, students must complete an Advanced Program within one of the following specialization areas:

- Plant Biology (PLNT)
- Entomology (ENTM)
- Microbiology (MICB)
- Zoology (Zool)
- Cell and Molecular Biology and Genetics (CMBG)
- Physiology and Neurobiology (PHNB)
- Marine Biology (MARB)
- Behavior, Ecology, Evolution & Systematics (BEES)
- General Biology (GENB)
- Individualized Studies (BIVS)

A complete list of Specialization Area requirements is available from the Biological Sciences Program Office, (301) 405-6892, and on our website at [www.life.umd.edu](http://www.life.umd.edu).

The undergraduate curriculum in Biological Sciences at the university emphasizes active learning through student participation in a variety of quality classroom and laboratory experiences. The well-equipped teaching laboratories train students in modern research technologies. The program requires supporting course work in chemistry, mathematics, and physics, yet allows time for exploration of other academic disciplines.

Each participating department offers research opportunities that may be completed either in a faculty member's research laboratory or field site or at one of the many nearby research facilities. The National Institutes of Health, the Patuxent Wildlife Refuge, the National Zoo, and the Chesapeake Bay Laboratory are just a few of the many sites utilized by University of Maryland students.

Many of our graduates pursue advanced degrees in master's or doctoral programs or in medical, dental, or other professional schools. Some elect to seek employment as skilled technical personnel in government or industry research laboratories. Others pursue careers in fish and wildlife programs, zoos, and museums. Other recent graduates are now science writers, sales representatives for the biotechnology industry, and lawyers specializing in environmental and biotechnology related issues.

The College also works with students interested in pursuing double degree programs with a life sciences discipline and secondary science education. Please contact Dr. Joelle Presson, 1326A Symons Hall, (301) 405-3892 for more information.

### Requirements for Major

	<b>Semester Credit Hours</b>
CORE Program Requirements .....	30
Basic Program in Biological Sciences	
BSCI 105—Principles of Biology I .....	4
BSCI 106—Principles of Biology II .....	4
BSCI 222—Principles of Genetics .....	4
One or two courses in Organismal Diversity .....	4
Supporting courses .....	30-32
MATH 220 or 140—Calculus I	
MATH 221 or 141—Calculus II	
CHEM 103—General Chemistry I	
CHEM 113—General Chemistry II	
CHEM 233—Organic Chemistry I	
CHEM 243—Organic Chemistry II	
PHYS 121 or 141—Physics I	
PHYS 122 or 142—Physics II	
Total Credits in Basic Program .....	42-44
Advanced Program .....	21-24
Electives .....	16-19

A grade of C or better is required for BSCI 105, 106, 222, the diversity course, all courses in the Advanced Program and all supporting courses (math, chemistry, and physics). Majors in Biological Sciences cannot use any Life Sciences course to fulfill CORE Advanced Studies requirements, including courses in CHEM or BCHM.

### Advising

Advising is mandatory during each pre-registration period for all Biological Sciences majors. All freshmen and new transfer students will be assigned an adviser from the College of Life Sciences advising staff. Students will be assigned to a departmental faculty adviser once a basic sequence of courses has been successfully completed. The departmental faculty advisers are coordinated by the following persons for the indicated specialization areas. These coordinating advising offices can be contacted for making appointments with an adviser or for any other information regarding that specialization area.

<b>Smith</b>	1219 H.J. Patterson	(301) 405-2766	CMBG, MICB PLNT GENB
<b>Compton</b>	2227 Bio.Psych. Bldg.	(301) 405-6904	ZOOL, PHNB, MARB, BEES
<b>Kent</b>	3142 Plant Sciences Bldg.	(301) 405-3911	ENTM, GENB
<b>Presson</b>	1326A Symons Hall	(301) 405-6892	BIVS

### Honors

Outstanding students are encouraged to apply to departmental Honors Programs. Through the Honors Programs students will become actively involved in the ongoing scientific research at the university. Information about these honors programs may be obtained from the Associate Director.

Course Code: BSCI

## BIOLOGY (BIOL)

### College of Life Sciences

2227 Biology-Psychology Building, (301) 405-6904

E-mail: [biolograd@umail.umd.edu](mailto:biolograd@umail.umd.edu)

Professor and Chair: Jeffery

Associate Chair: Compton

Professors: Borgia, Carr, Cohen, Colombini, Gill, O'Connor, Payne, Popper, Reaka-Kudla, Sebens, Via, Wilkinson

Associate Professors: Dietz, Dudash, Fagan, Fenster, Forseth, Higgins, Imberski, Inouye, Shaw, Small

Assistant Professors: Bely, Davenport, Haag, Hare, Lee, Quinlan, Sukharev, Tishkoff

Lecturers: Compton, Infantino, Jensen, Koines, Opoku-Edusei, Perrino, Shapiro

Jointly Appointed Faculty: Mount, Palmer, Poeppel, Simon

Professors Emeriti: Anastos, Clark, Corliss, Haley, Highton, Pierce

Director of Graduate Studies: Forseth

Director of Undergraduate Studies: Compton

The Department of Biology (comprised of former Zoology and some former Plant Biology department faculty) participates in teaching and advising in the inter-departmental undergraduate Biological Sciences Program (see separate listing). Faculty interest and expertise span levels of organization from molecules to ecosystems in animals and plants.

### Requirements for Specialization

See Biological Sciences Program elsewhere in this chapter, or contact the Department of Biology Undergraduate Office.

### Advising

Advising in the Biological Sciences program is mandatory. Students are assigned an advisor based on their area of specialization. The Department of Biology faculty coordinate and advise students who specialize in Physiology and Neurobiology (PHNB), Marine Biology (MARB), Zoology (ZOO), and Behavior, Ecology, Evolution and Systematics (BEES). Contact the Department of Biology Undergraduate Office, 405-6904, for information about advising or to schedule an appointment. For advising in other Biological Sciences Specialization areas, see the Biological Sciences Program listing in this catalog.

### Honors

The Department of Biology Honors Program offers highly motivated and academically qualified students the opportunity to work closely with a faculty mentor on an original, independent research project. Students are required to participate in the program for at least three semesters, and need not have been admitted University Honors program in order to participate. Contact the undergraduate office for more information.

Course Code: BSCI

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## BUSINESS AND MANAGEMENT, GENERAL

For information, consult the Robert H. Smith School of Business entry in chapter 6.

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## CELL BIOLOGY AND MOLECULAR GENETICS

**Note:** The Department of Microbiology has merged with the Department of Plant Biology. The new name of the expanded department is the Department of Cell Biology and Molecular Genetics.

### College of Life Sciences

Microbiology Building, (301) 405-5435

[www.life.umd.edu/CBMG](http://www.life.umd.edu/CBMG)

Chair: Ades

Professors: Bean, Cooke, Gantt, Joseph, Mosser, Simon, Stein, Sze, Wolniak, Yuan

Associate Professors: Benson, Bottino, Chang, Delwiche, DeStefano, Dinman, Hutcheson, Liu, Mount, Song, Stewart, Straney

Assistant Professors: DeCuevas, DiRuggiero

Instructors: Caines, Shields, Smith

Professors Emeriti: Colwell, Cook, Doetsch, Hetrick, Kantzes, Lockard, Patterson, Pelczar, Reveal, Roberson, Weiner

Affiliate Professors: Colombini, Jeffery, Mather

Adjunct Associate Professors: Baehrecke, Culver, Green, Vakharia

Adjunct Professors: Moss, Nuss

Research Assistant Professors: Brown, DeCampio, Cunningham

## The Majors

The department participates in the teaching and advising of three specialization areas of the interdepartmental major in Biological Sciences. They are Microbiology (MICB), Plant Biology (PLNT), and Cell, Molecular Biology, and Genetics (CMBG).

Microbiology is a field fundamental to all of biology. Specialization in the field encompasses not only study of the fundamental processes of bacteria, but also the examination of animal, plant, and bacterial viruses, as well as animal and plant defense systems that counter infection and invasion of microorganisms. Microbiology, including the sub-fields of virology and immunology, continues to be at the forefront. Microbiological principles are being applied in ecology, biotechnology, medicine, agriculture, and the food industry.

The Plant Biology specialization area is designed with a diverse range of career possibilities for students in plant biology and plant protection. The department offers instruction in the fields of physiology, molecular biology, pathology, ecology, taxonomy, genetics, mycology, nematology, virology, and evolutionary plant biology.

Cell, Molecular Biology, and Genetics are combined into one specialization area due to their inter-relatedness and overlap. The combined areas will allow focus on the internal working of the cell and the interactions between cells, as well as the techniques used to understand cellular processes at the molecular level.

These areas of the biological sciences program will allow students to find opportunities in academia, industry, government, medicine, law, biotechnology, and public health.

### Requirements for the Specialization Areas

See the Biological Sciences entry in this catalog or contact an adviser for specific program requirements.

### Advising

Advising is mandatory. Students are assigned to faculty advisers based upon their area of specialization. The Department of Cell Biology and Molecular Genetics faculty coordinate and advise students who specialize in Microbiology (MICB), Plant Biology (PLNT), and Cell, Molecular Biology, and Genetics (CMBG). Contact the undergraduate program for information. Advising web page: [www.life.umd.edu/advising](http://www.life.umd.edu/advising). 1219 HJ Patterson Bldg., Phone (301) 405-2766.

## Research Experience and Internships

Students may gain research experience in off-campus laboratories or in on-campus faculty laboratories. Contact the undergraduate program office, (301) 405-2766, for more information.

## Honors and Awards

The Departmental Honors Program involves an independent research undertaken with a faculty adviser. For information, contact the Honors Coordinator, S. Hutcheson, 3123 Microbiology Building. The P. Arne Hansen Award may be awarded to an outstanding departmental honors student. The Sigma Alpha Omicron Award is given annually to the graduating senior selected by the faculty as the outstanding student in Microbiology.

## Student Organizations

All students interested in microbiology are encouraged to join the University of Maryland student chapter of the American Society for Microbiology, the professional scientific society for microbiologists. Information on this organization may be obtained from the ASM website, [www.asmsa.org](http://www.asmsa.org).

## 94 Chemical Engineering

### CHEMICAL ENGINEERING (ENCH)

#### A. James Clark School of Engineering

2113 Chemical and Nuclear Engineering Bldg., (301) 405-1935  
[www.ench.umd.edu/](http://www.ench.umd.edu/)

Professor and Chair: Barbari  
Associate Chair for Undergraduate Studies: Wang  
Associate Chair for Graduate Studies: Adomaitis  
Professors: Anisimov, Barbari, Bentley, Calabrese, Choi, DiMarzio\*\*,  
Gentry, Greer, McAvoy, Weigand, Yang\*\*  
Associate Professors: Adomaitis, Kofinas, Ranade\*\*, Wang, Zafriou  
Assistant Professors: Dimitrakopoulos, Ehrman, Klapa, Pulliam-Holoman,  
Raghavan  
Emeriti: Gomezplata, Regan, Sengers, Smith  
\*\*Adjunct

#### The Major

The Chemical Engineering major is intended to equip students to function as effective citizens and engineers in an increasingly technological world as well as in science and engineering subjects. Depth as well as breadth is required in the humanities and social sciences to understand the economic, ecological, and human factors involved in reaching the best technological solutions to today's problems.

The basic foundation in mathematical, chemical, physical, and engineering sciences is established in the first two years of the curriculum. A core of required chemistry and chemical engineering courses is followed by a flexible structure of electives that allows either breadth or specialization. Appropriate choices of electives can prepare a Chemical Engineering major for a career as an engineer and/or for graduate study. It is also an attractive major for those seeking a professional degree in medicine or law.

Areas stressed in the major include biochemical engineering, environmental engineering, polymer engineering, systems engineering, and engineering science. Project courses allow undergraduates to undertake independent study under the guidance of a faculty member in an area of mutual interest.

#### Requirements for Major

Requirements for the Chemical Engineering major include a thorough preparation in mathematics, physics, chemistry, and engineering science. Elective courses must include both Chemical Engineering courses and technical courses outside the department. A sample program is shown below.

	Semester	
	I	II
<b>Freshman Year</b>		
ENES 100—Intro to Engineering Design .....	3	
ENES 102—Statics .....		3
MATH 140—Calculus I .....	4	
MATH 141—Calculus II .....		4
CHEM 135, 136—General Chemistry for Engineers .....	3	1
ENGL 101—Introduction to Writing .....	3	
PHYS 161—General Physics I .....	3	
Core Program Requirements .....		6
<b>Total Credits</b> .....	<b>13</b>	<b>17</b>
<b>Sophomore Year</b>		
MATH 241—Calculus III .....	4	
MATH 246—Differential Equations for Scientists & Engineers .....	3	
PHYS 262, 263—General Physics .....	4	4
CHEM 233—Organic Chemistry I .....	4	
CHEM 243—Organic Chemistry II .....	4	
ENCH 215—Chem. Engr. Analysis .....	3	
ENCH 250—Computer Methods in Chem. Engineering .....	3	
ENCH 300—Chemical Process Thermodynamics .....	3	
Core Program Requirements .....	3	
<b>Total Credits</b> .....	<b>18</b>	<b>17</b>
<b>Junior Year</b>		
ENES 230—Intro. to Materials and their Applications .....	3	
ENCH 333—Seminar .....		1
ENCH 400—Chemical Engineering Thermodynamics .....	3	
ENCH 440—Chemical Engineering Kinetics .....	3	
ENCH 442—Chemical Engr. Systems Analysis .....	3	
CHEM 482—Physical Chemistry II .....	3	
CHEM 483—Physical Chemistry Lab I .....	2	
ENCH 422—Transport Processes I .....	3	

ENCH 424—Transport Processes II .....	3
ENCH 426—Transport Processes III .....	3
CORE Program Requirements .....	3
<b>Total Credits</b> .....	<b>17</b>

#### Senior Year

ENCH 437—Chemical Engr. Lab .....	3
ENCH 444—Process Engr. Economics and Design I .....	3
ENCH 446—Process Engr. Economics and Design II .....	3
Technical Electives* .....	6
Advanced Chemistry Elective* .....	3
CORE Program Requirements .....	3
<b>Total Credits</b> .....	<b>15</b>

Minimum Degree Credits: 128 credits and fulfillment of all departmental, school, and university requirements with a cumulative grade point average of 2.0.

\*Students must consult with an adviser on selection of appropriate courses for their particular course of study.

#### Technical Electives Guidelines

Nine credits of technical electives and three credits of advanced chemistry electives are required. It is recommended that they be taken during the senior year.

Additional guidelines are as follows:

The senior technical electives are 400-level chemical engineering courses, including ENCH468x, and a limited number of approved 400-level technical courses from outside chemical engineering. Students should select electives with the help of an academic advisor. In general, at least two of the three technical electives should be ENCH4XX; the third one may be chosen from ENCH or from an approved list of non-ENCH technical courses. Business or non-technical courses are normally not approved. The advanced chemistry elective is normally a 400-level chemistry course.

Upon the approval of the academic advisor and written permission of the department, a limited amount of substitution may be permitted. Substitutes, including ENCH468 Research (1-3 credits), must fit into an overall plan of study emphasis and ensure that the plan fulfills accreditation design requirements. Students may elect to specialize in a specific area such as Biochemical Engineering, Environmental Engineering, Polymer Engineering, or Systems Engineering; or they may sample a variety of elective courses. Upon graduation, those who specialize in a particular technical area will receive a letter in recognition of their accomplishment from the Chair and the Director of Undergraduate Studies of the Chemical Engineering Department. A list of technical electives are posted at: [www.ench.umd.edu/ugrad/](http://www.ench.umd.edu/ugrad/)

#### Admission

All Chemical Engineering majors must meet admission, progress, and retention standards of the Clark School of Engineering.

#### Advising

All students choosing Chemical Engineering as their primary field must see an undergraduate adviser each semester. Appointments for advising can be made at 2113 Chemical and Nuclear Engineering Building, (301) 405-1935.

#### Co-op Program

The Chemical Engineering program works within the Clark School of Engineering Cooperative Engineering Education Program. For information on this program consult the Clark School of Engineering entry in chapter 6 of this catalog or call (301) 405-3863.

#### Financial Assistance

Financial aid based upon need is available through the Office of Student Financial Aid. A number of scholarships are available through the Clark School of Engineering. Part-time employment is available in the department.

## Honors and Awards

Annual awards are given to recognize scholarship and outstanding service to the Department, College and University. These awards include the David Arthur Berman Memorial Award, the Engineering Society of Baltimore Award, and the American Institute of Chemical Engineers (AIChE) Award for the outstanding senior in Chemical Engineering. Chairman's awards are given to the junior with the highest cumulative GPA as well as to the outstanding junior and outstanding senior in Chemical Engineering.

## Student Organizations

Students operate a campus student chapter of the professional organization, the American Institute of Chemical Engineers. Omega Chi Epsilon is the honorary Chemical Engineering Society.

Course Code: ENCH

## CHEMISTRY AND BIOCHEMISTRY (CHEM, BCHM)

### College of Life Sciences

0107H Chemistry Building, (301) 405-1788  
Student Information: 0107 Chemistry Building, (301) 405-1791  
[www.chem.umd.edu](http://www.chem.umd.edu)

Professor and Chair: DeShong  
Associate Chairs: Ammon, Eichhorn  
Director, Undergraduate Programs: Ammon  
Professors: Alexander††, Allewell, Ammon, Beckett, Blough, Davis, DeShong†, Eichhorn, Falvey, Fenselau, Greer, Hansen, Helz†, Jarvis†, Kahn, Kahna, Lorimer ††, Mignerey†, Miller, Moore, Ondov, Rokita, Sita, Thirumalai, Tossell, Walters, Weeks††  
Associate Professors: Fushman, Julin, Lee, C. Murphy, Reutt-Robey  
Assistant Professors: English, Hu, Isaacs, Lee, S., Morehead, Muñoz, Vedernikov, Walker  
Instructors: Ebrahimian, Rebbert  
Lecturers: Everett, McDermott-Jones  
Emeriti: Bellama, DeVoe, Freeman, Henery-Logan, Holmlund, Huheey, Jaquith, Kasler, Mazzocchi, McNesby, Munn, O'Haver, Pratt, Sampugna, Stewart, Stuntz  
†Distinguished Scholar-Teacher  
††Distinguished University Professor  
Adjunct Professors: Khachik, Kearney, Mazzola

## The Majors

The Department of Chemistry and Biochemistry offers B.S. Degrees in both chemistry and biochemistry. The programs are designed with the maximum amount of flexibility to prepare students for graduate or professional school, career opportunities in chemical and pharmaceutical industries, and basic research positions in government and academic laboratories.

Chemistry courses for majors in chemistry or biochemistry begin with the two-semester General Chemistry sequence for majors: CHEM 143, 153/227 (CHEM 153 and CHEM 227 are corequisites). Students who transfer into the chemistry or biochemistry programs and do not have the equivalent of CHEM 143-153-227 must take a three-semester sequence: CHEM 103-113-227. Additional courses common to both biochemistry and chemistry majors are the two-semester sequence in organic chemistry (CHEM 237-247), the one-credit seminar in professional issues (CHEM 395), the instrumental analysis course (CHEM 425), the two-semester lecture sequence in physical chemistry (CHEM 481-482) the first semester (CHEM 483) of the physical chemistry laboratory sequence, and UNIV 100 or 101.

Supporting courses for majors in both programs include MATH 140, MATH 141, PHYS 141, PHYS 142, and BSCI 105.

### Requirements for Chemistry Majors

Departmental requirements for chemistry majors include 18 credits of lower-level and 23 credits of upper-level courses. In addition to the specific courses mentioned above, chemistry majors take the inorganic chemistry course (CHEM 401), the second semester of physical chemistry laboratory (CHEM 484), and six credits of electives selected from approved chemistry and biochemistry courses. In order to meet requirements for a degree to be certified by the American Chemical Society, students must select certain specific courses, as explained by the undergraduate office.

Each required chemistry and biochemistry course must be passed with a minimum grade of C. Required supporting courses including BSCI 105 must be passed with a C average.

	<b>Semester Credit Hours</b>
University CORE Requirements .....	30
College of Life Sciences Core Requirements .....	5*
Departmental Requirements .....	43
Supporting Courses .....	16
Electives.....	26
<b>Total .....</b>	<b>120</b>

### Requirements for Biochemistry Majors

Departmental requirements for biochemistry majors include 30 credits of specific chemistry courses and BCHM 461, 462, and 464. In addition to the College of Life Sciences Core Requirement of BSCI 105 (4), biochemistry majors must take two additional approved biological science courses; certain specific courses, as explained by the undergraduate office.

Each required chemistry, biochemistry and 200-level or above biological sciences course must be passed with a minimum grade of C. Required supporting courses, including BSCI 105, must be passed with a C average.

	<b>Semester Credit Hours</b>
University CORE Requirements .....	30
College of Life Sciences Core Requirements .....	5*
Departmental Requirements .....	46
Supporting Courses .....	16
Electives.....	23
<b>Total .....</b>	<b>120</b>

\*Other College of Life Sciences Core Requirements are satisfied by the departmental requirements.

## Advising

Advising is mandatory. Appointments for advising can be made by contacting the secretary in the Office of Undergraduate Studies, Room 0107 Chemistry Building, (301) 405-1791.

## Financial Assistance

Two scholarships are available for majors: the Isidore and Annie Adler Scholarship of \$500 to an outstanding major with financial need and the Leidy Foundation Scholarships of \$600 to two outstanding junior majors. No application is necessary, as all majors are automatically reviewed by the Awards Committee.

## Honors and Awards

Students with a GPA of 3.0 or better who have completed two semesters of CHEM 399 (Introduction to Chemical Research) have an opportunity to sign up for CHEM 398 (Honors Research) in their senior year and be considered for departmental honors. After successful completion of a senior honors thesis and seminar, graduation "with honors" or "with high honors" in chemistry or biochemistry can be attained.

## Student Organizations

Alpha Chi Sigma Chemistry Fraternity is a professional fraternity which recruits men and women students from chemistry, biochemistry, and related science majors during each fall and spring semester. The fraternity holds weekly meetings and provides tutoring for students in lower-level chemistry courses. The office is in Room 1521 Chemistry Building. Dr. Lyle Isaacs (2130 Chemistry Building, (301) 405-1884) is the faculty advisor.

Course Codes: CHEM, BCHM

### CIVIL AND ENVIRONMENTAL ENGINEERING (ENCE)

#### A. James Clark School of Engineering

1179 Engineering Classroom Building, (301) 405-1974

[www.ence.umd.edu](http://www.ence.umd.edu)

Professor and Chair: Baecher

Professor and Director: Mahmassani

Professors: Aggour, Albrecht, Amde, Ayyub, G. Chang, Davis, Donaldson, Goodings, Haghani, Hao, McCuen, Schelling, Schonfeld, Sternberg, Vannoy

Associate Full: Haghani

Associate Professors: Austin, Brubaker, P. Chang, Goulias, Moglen, Schwartz, Torrents

Assistant Professors: Aydilek, Clifton, Gabriel, Lovell, Medina, Miller-Hooks, Seagren, Tseny

Professor Emeritus: Birkner, Carter, Colville, Ragan

#### The Major

Civil and Environmental Engineering is a people-serving profession, concerned with the planning, design, construction and operation of large complex systems such as buildings and bridges, water purification and distribution systems, highways, rapid transit and rail systems, ports and harbors, airports, tunnels and underground construction, dams, power-generating systems, and structural components of aircraft and ships. Civil and environmental engineering also includes urban and city planning, water and land pollution and treatment problems, and disposal of hazardous wastes and chemicals. The design and construction of these systems are only part of the many challenges and opportunities for civil and environmental engineers. The revolution in computers, communications, and data management has provided new resources that are widely used by the professional civil and environmental engineer in providing safe, economical, and functional facilities to serve our society.

#### Requirements for Major

At both the undergraduate and graduate levels, the department offers programs of study in six major areas in civil engineering: engineering management, environmental engineering, geotechnical engineering, structural engineering, transportation engineering, and water resources and remote sensing. A total of 122 credit hours is required for a bachelor of science (B.S.) degree with emphasis in basic science (mathematics, chemistry, and physics), engineering science (mechanics of materials, statics, and dynamics), basic civil and environmental engineering core courses; and 18 credits of technical electives that may be selected from a combination of the six areas of civil engineering specialization and other approved courses. The curriculum provides a sensible blend of required courses and electives, which permits students to pursue their interests without the risk of overspecialization.

#### Program Learning Objectives

The faculty of the Department of Civil Engineering has established the following Program Educational Objectives:

1. Prepare all of our BSCE graduates with competitive skills and a comprehensive training in civil engineering, including opportunities for specialized training in the major discipline areas of civil engineering. The program should be competitive with the top civil engineering programs in the nation with respect to degree requirements, educational facilities, and faculty expertise.
2. The program should seek to attract and retain the best possible students, from a diverse population, including historically under-represented groups, including women.
3. The program should be structured with a common engineering Freshman year, and a Sophomore year with relatively few specialized civil engineering courses. The focus in these first two years should be primarily on basic engineering and physical sciences and fundamentals, to accommodate undecided students in the Department and throughout the School of Engineering, and allow for the articulated entry of students from the State Community College System.
4. The program should provide exposure to the broad spectrum of civil engineering practice in the Junior year to assist students in selecting an area of concentration within civil engineering that can provide focus and depth in the Senior year.

5. Prepare all of our graduates for successful careers in industry, government service, and future private practice, while seeking to qualify as many of our students as possible for admission to advanced study in the nation's best graduate schools in either engineering, business, or other areas of study where a first class civil engineering education is an excellent source of preparation.
6. The program should seek to instill in all students an appreciation and commitment to self-study, lifelong learning, and ensure that all students have an understanding of the context and ethical responsibilities within which the engineering profession is practiced. The program should also provide opportunities for students to work in teams, develop communication skills, and engage in a comprehensive multidisciplinary capstone design experience.
7. The Faculty in the Department should seek to continually enhance the quality of the undergraduate program by improving course offerings and curricula.

Decisions are to be based on assessments of the quality of our graduates and alumni, feedback from employers of our graduates, and self assessment of the faculty and program in meeting our objectives and learning outcomes goals.

#### Program Outcomes

In addition to ensuring technical competency of all graduates in the broad discipline areas of civil engineering, the Department must encourage the development of skills and abilities that will enhance the marketability of its graduates and provide them with the best possible opportunity for success in the work place. As a result, the faculty has agreed to develop the following abilities and skills within each graduate and has approved the following Program Outcomes:

1. Technical competence in mathematics, physical science, and engineering science.
2. Technical competence in basic civil engineering sciences.
3. Technical competence in at least one major area of specialization within civil and environmental engineering.
4. Ability to use computers, software, and experimentation as tools to solve engineering problems.
5. Ability to communicate and defend ideas effectively, including oral, written, and technical reports writing skills.
6. Ability to identify engineering problems and propose alternate solutions, including the step-by-step analysis and design of a system, component, or process.
7. Teamwork skills as applied to interdisciplinary design projects.
8. Understanding and appreciation of both the societal context of the civil engineering profession, and the ethical responsibilities of practicing engineers.
9. Appreciation of the need to seek further specialization within civil engineering and commit to life-long learning.
10. Awareness of the impact of technology and engineering on society, including life safety and environmental issues.
11. Interest in contemporary issues, both nationally and internationally, and the awareness of the impact of engineering in these areas.
12. Understanding of the importance of active participation in professional societies and the organizations in professional practice.

Technical competence is measured by the ability to apply knowledge and fundamental principles to the solution of problems in each area noted. The students' perceptions of their abilities and growth in the above areas, and their opinions of the effectiveness of the program in meeting the program objectives, will be surveyed each semester and compared to faculty assessments to provide a solid basis for determining the actions needed to enhance the program and improve the quality and abilities of all graduates.

	Semester	
	I	II
<b>Freshman Year (All Civil Engineering)</b>		
MATH 140—Calculus I .....	4	
MATH 141—Calculus II .....	4	
CHEM 135—General Chemistry for Engineers .....	3	
ENES 100—Introduction to Engineering Design .....	3	
ENES 102—Statics.....	3	
ENGL 101—Introduction to Writing .....	3	
PHYS 161—General Physics.....	3	
CORE Program Requirements .....	6	
<b>Total .....</b>	<b>13</b>	<b>16</b>

<b>Sophomore Year (All Civil Engineering)</b>		
MATH 241—Calculus III .....	4	
MATH 246—Differential Equations for Scientists and Engineers .....	3	
PHYS 262—General Physics II .....	4	
ENES 220—Mechanics of Materials.....	3	
ENCE 200—Engineering Information Processing I .....	3	
ENCE 201—Engineering Information Processing II .....	3	
ENCE 210—Introduction to Civil Engineering .....	1	
ENCE 215—Applied Engineering Science.....	3	
ENCE 305—Fundamentals of Engineering Fluids .....	3	
CORE Program Requirements .....	6	
<b>Total .....</b>	<b>17</b>	<b>16</b>

<b>Junior Year</b>		
<b>Infrastructure Engineering Track .....</b>	<b>1</b>	<b>11</b>
ENGL 393—Technical Writing .....	3	
ENES 221—Dynamics .....	3	
ENCE 300—Fundamentals of Engineering Materials .....	3	
ENCE 301—Geo-Metrics and GIS in Civil Engineering .....	3	
ENCE 302—Probability and Statistics for Civil & Environmental Engineers .....	3	
ENCE 340—Fundamentals of Geotechnical Engineering .....	3	
ENCE 353—Introduction to Structural Analysis .....	3	
ENCE 355—Introduction to Structural Design .....	3	
ENCE Electives* .....	3	
CORE Program Requirements .....	3	
<b>Total .....</b>	<b>15</b>	<b>15</b>

<b>Transportation Systems &amp; Engineering Management Track</b>		
ENGL 393—Technical Writing .....	3	
ENCE 300—Fundamentals of Engineering Materials .....	3	
ENCE 301—Geo-Metrics and GIS in Civil Engineering .....	3	
ENCE 302—Probability and Statistics for Civil & Environmental Engineers .....	3	
ENCE 320—Engineering Project Management .....	3	
ENCE 360—Analysis of Civil Engineering Systems .....	3	
ENCE 361—Applied Numerical Techniques .....	3	
ENCE 370—Introduction to Transportation Engineering & Planning .....	3	
ENCE 472—Transportation Engineering .....	3	
CORE Program Requirements .....	3	
<b>Total .....</b>	<b>15</b>	<b>15</b>

<b>Environmental &amp; Water Resources Engineering Track</b>		
ENGL 393—Technical Writing .....	3	
BSCI 105—Principles of Biology I .....	4	
ENCE 300—Fundamentals of Engineering Materials.....	3	
ENCE 301—Geo-Metrics and GIS in Civil Engineering .....	3	
ENCE 302—Probability and Statistics for Civil & Environmental Engineers .....	3	
ENCE 310—Introduction to Environmental Engineering .....	3	
ENCE 361—Applied Numerical Techniques .....	3	
ENCE 402—Simulation and Design of Experiments for Engineers .....	3	
ENCE 431—Hydrologic Engineering .....	3	
CORE Program Requirements.....	3	
<b>Total .....</b>	<b>16</b>	<b>15</b>

<b>Senior Year</b>		
<b>Infrastructure Engineering Track</b>		
ENCE 320—Engineering Project Management .....	3	
ENCE 441—Foundation Design .....	3	
ENCE 466—Design of Civil Engineering Systems .....	3	
ENCE Electives * .....	3	6
ENCE Restricted Electives **.....	3	3
CORE Program Requirements.....	3	3
<b>Total .....</b>	<b>15</b>	<b>15</b>

<b>Transportation Systems &amp; Engineering Management Track</b>		
ENCE 402—Simulation and Design of Experiments for Engineers .....	3	
ENCE 422—Project Cost Accounting & Economics .....	3	
ENCE 423—Project Planning, Scheduling & Control .....	3	
ENCE 470—Highway Engineering .....	3	
ENCE 466—Design of Civil Engineering Systems .....	3	
ENCE Electives* .....	6	3
CORE Program Requirements.....	3	3
<b>Total .....</b>	<b>15</b>	<b>15</b>

<b>Environmental and Water Resources Engineering Track</b>		
ENCE 411—Environmental Engineering Science .....	3	
ENCE 422—Project Cost Accounting & Economics .....	3	
ENCE 412—Environmental Engineering Unit Operations .....	3	
ENCE 432—Ground Water Hydrology .....	3	
ENCE 466—Design of Civil Engineering Systems .....	3	
ENCE Electives* .....	6	3
CORE Program Requirements.....	3	3
<b>Total .....</b>	<b>15</b>	<b>15</b>

Minimum Degree Requirements: 122 credits and the fulfillment of all departmental, school and University requirements with a cumulative grade point average of at least 2.0. Additional semester credits will be involved to the extent that courses carrying more than three credits are selected.

\*ENCE electives can be taken from among all courses that are designated as required for tracks other than the one in which the student is majoring and elective for the student's major track as well as ENCE 453, ENCE 454, ENCE 455, ENCE 488, ENCE 489. Other senior level mathematics, science, and engineering courses can also be selected with the permission of the Department Advisor.

\*\*ENCE Restricted Electives are to be taken from the following list: ENCE 361, ENCE 444, and ENCE 453

## Admission/Advising

See A. James Clark School of Engineering entrance requirements in chapter 6. All students are advised by Dr. Bruce Donaldson who assists in course selection and scheduling throughout the student's entire undergraduate program. For advising, contact Dr. Donaldson, (301) 405-1127, 1182 Engineering Classroom Building.

## Fieldwork and Internship Opportunities

Several excellent co-op opportunities are available for Civil Engineering students. See the A. James Clark School of Engineering entry in chapter 6 of this catalog for a full description of the Engineering co-op program, or contact Ms. Heidi Sauber, (301) 405-3863.

## Financial Assistance

The Department of Civil Engineering awards a number of academic scholarships. These awards are designated primarily for junior and senior students. A department scholarship committee solicits and evaluates applications each year.

## Honors and Awards

See A. James Clark School of Engineering Honors Program. The Department of Civil Engineering offers the following awards: 1) The Civil Engineering Outstanding Senior Award; 2) The ASCE Outstanding Senior Award; 3) The Woodward-Clyde Consultants Award; 4) The Bechtel Award; 5) The Chi Epsilon Outstanding Senior Award; 6) The Ben Dyer Award; 7) The ASCE Maryland Section Award; and 8) The Department Chairman's Award.

## Student Organizations

Student organizations include the American Society of Civil Engineers and Institute of Transportation Engineers student chapters which are open to all civil engineering students. The Civil Engineering Honor Society, Chi Epsilon, elects members semi-annually. Information on membership and eligibility for these student organizations may be obtained from the president of each organization, 0401 Engineering Classroom Building.

Course Code: ENCE

## 98 Classics

### CLASSICS (CLAS)

#### College of Arts and Humanities

2407 Marie Mount Hall, (301) 405-2014

E-mail: [jh10@umail.umd.edu](mailto:jh10@umail.umd.edu)

[www.inform.umd.edu/EdRes/Colleges/ARHU/Depts/Classics](http://www.inform.umd.edu/EdRes/Colleges/ARHU/Depts/Classics)

Professors: Hallett† (Chair)

Associate Professors: Doherty, Lee, Staley, Stehle

Assistant Professor: Dietrich, Rutledge

†Distinguished Scholar-Teacher

#### The Major

Classics is the study of the languages, literature, culture and thought of ancient Greece and Rome. Students at the University of Maryland may major in Classical Languages and Literatures with four options and may enroll in a variety of courses on the classical world. These options include Latin, Greek, Greek and Latin, and Classical Humanities. Changes in requirements for supporting courses are under review. Students should consult the department for updated information.

#### Advising

Departmental advising is mandatory for all majors every semester.

#### Requirements for Major

Requirements for the Classics major include the College of Arts and Humanities requirement of 45 upper-level credits completed.

The College foreign-language requirement will be automatically fulfilled in the process of taking language courses in the major.

##### Option A: Latin

Thirty credits of Latin at the 200-level or higher, at least 12 of which must be at the 400-level or higher, plus nine credits of supporting courses (for example, CLAS 170, HIST 110, and one 300- or 400-level course in Roman history).

##### Option B: Greek

Thirty credits of Greek at the 200-level or higher, at least 12 of which must be at the 400-level or higher, plus nine hours of supporting courses (for example, CLAS 170, HIST 110, and a 300- or 400-level course in Greek history).

##### Option C: Latin and Greek

Thirty credits of either Greek or Latin and 12 hours of the other classical language, plus nine hours of supporting courses (for example, CLAS 170, HIST 110, and a 300- or 400-level course in Greek or Roman history). Students with no previous training in the second language may count introductory level courses as part of the 12-hour requirement.

##### Option D: Classics in Translation (Classical Humanities)

Eighteen credits in CLAS courses; 12 credits in Greek or Latin courses; 12 credits in upper-level supporting courses (normally in Art History, Archaeology, Architecture, Government, History, Linguistics, or Philosophy). Note: Students are encouraged to substitute 300- and 400-level courses in LATN and GREK for some of the 18 required hours in CLAS.

Students must take language acquisition courses sequentially, i.e., 101, 102, 201. Once credit has been received in a higher-level language acquisition or grammar course, a lower-level course may not be taken for credit. The student should begin the sequence at the appropriate level.

#### Citations

##### Citations in Ancient Greek Language and Literature

16 credit hours. GREK 201, CLAS 270, GREK 301, and two courses from approved list of courses.

##### Citation in Classical Language and Mythology

15-16 credit hours. CLAS 170, 470, and three courses from approved list of courses. (Includes some Greek or Latin.)

##### Citation in Classical Mythology

15 credit hours. CLAS 170, 470, and three courses from approved list of courses. (No Greek or Latin Required.)

##### Citation in Latin Language and Literature

16 credit hours. LATN 201 or 220, CLAS 271, and three courses from approved list of courses.

Students who fulfill Citation requirements will receive a Citation on the official transcript. Please contact the Director of Undergraduate Studies for more information.

Course Codes: CLAS, GREK, LATN

### COMMUNICATION (COMM) (FORMERLY SPEECH COMMUNICATION)

#### College of Arts and Humanities

2130 Skinner Building, (301) 405-8979 (main office), 405-6519 (undergraduate office)

[www.comm.umd.edu](http://www.comm.umd.edu)

Professor and Chair: Fink†

Professors: J. Grunig, L. Grunig, Wolvin

Associate Professors: D. Cai, Gaines, Klumpp, McCaleb, Parry-Giles, Tonn

Assistant Professor: Turner

Outreach Coordinator: Gowin

Visiting Professors: Kendall, Niles

Visiting Assistant Professors: Byerly, Hubbard, Sha

Lecturers: J. Cai, Mason

Affiliate Professors: Brown (SOCY), Fahnestock (ENGL), Gurevitch (JOUR), Kruglanski (PSYC), Rosenfelt (WMST)

Affiliate Associate Professor: Gefland

†Distinguished Scholar-Teacher

Communication takes as its subject matter the history, processes, and effects of human communication through speech and its extensions. The departmental curriculum is designed to provide a liberal education in the arts and sciences of human communication as well as preparation for career opportunities in business, government, education, and related fields. Within the curriculum, students may pursue academic programs that emphasize many disciplinary areas, including intercultural communication, political communication, public relations, negotiation and conflict management, cognition and persuasion, rhetorical theory, history of rhetoric, and criticism of public discourse. Departmental advising is mandatory for new majors, second semester sophomores, and seniors.

#### Admission to the Major

##### First-time Freshman

All first-time freshmen who designate communication as a major prior to the end of the schedule adjustment period of their first semester will be admitted directly into the program. They must sign a Memorandum of Understanding that states that they understand that by the semester in which they attain 45 University of Maryland credits (excluding AP), they must meet the following Gateway requirements.

- Complete 50% of the CORE requirements, including Fundamental Studies requirements in Mathematics and English.
- Complete one of the following courses with a grade of C or better: BMGT230, CCJS200, EDMS451, PSYC200, SOCY201, or equivalent.
- Complete COMM 107, COMM 200, or COMM 230 with a grade of C or better
- Complete COMM 250 with a grade of C or better and
- A GPA of 2.0 or better

Students may repeat only one of the Gateway courses and that may be repeated only once in their attempt to meet the requirements and students who fail to meet them by the semester in which they attain 45 credits will be dismissed from the program and cannot reapply.

##### Transfer Students

Internal and external transfer students who meet the Gateway requirements specified above and have a cumulative GPA of 2.7 who apply to the program *in the semester in which they reach 56 credits* will be admitted into the program.

For those students who meet the Gateway requirements and who apply after the semester in which they reach 56 credits, admission is competitive and on a space-available basis.

## Appeals

All students may appeal admission decisions. Students directly admitted as freshmen, who are dismissed because of failure to meet Gateways or be in good academic standing at 45 credits, may appeal directly to the Undergraduate Director in the Department of Communication. All other students who are denied admission may appeal to the Office of Admission of the University.

Students currently enrolled in a public college or university in the State of Maryland are not subject to these requirements until Fall 2003.

## The Major

Requirements for the Communication major include a minimum of 45 upper-level credits and the foreign language requirement of the College of Arts and Humanities. No course with a grade less than C may be used to satisfy major requirements.

For coursework in Intercultural Communication, Mediated Communication, Negotiation and Conflict Management, Persuasion and Attitude Change, Political Communication, Public Relations, and Rhetoric and Public Discourse, see the Department of Communication (p. 76). For academic programs in Print News, Broadcast News, Magazine and On-Line Journalism, and copy-editing see the College of Journalism (p. 175-176).

## Requirements for Major

The course of study for a Communication major must satisfy all of the following requirements.

1. One course from the following list: COMM 107, 200, or 230.
2. COMM 250, 400, and 401.
3. Completion of one of the following tracks: Communication Research, Communication Studies, Public Relations, or Rhetoric and Public Discourse.
  - a. Communication Research COMM 402  
Five courses from the following: COMM 420, 424, 425, 426, 435, 470, 475, 477, 482. 6 semester hours in COMM at least three of which are at the 300-400 level. One course from the following (Statistical Analysis): PSYC 200, SOCY 201, BMGT 230, EDMS 451 or an equivalent course. One course from the following (Structural Analysis of Language): LING 200, HESP 120, ANTH 380 or an equivalent course. 9 semester hours in courses related to Communication Research in one department other than COMM
  - b. Communication Studies COMM 402  
One course from the following: COMM 420, 424, 425, 426, 435, 470, 475, 477, 482. One course from the following: COMM 330, 360, 450, 451, 453, 455, 460, 461, 469, 471, 476. 15 semester hours in COMM courses at least 12 of which must be at the 300-400 level. One course from the following (Statistical Analysis): PSYC 200, SOCY 201, BMGT 230, EDMS 451 or an equivalent course. One course from the following (Structural Analysis of Language): LING 200, HESP 120, ANTH 380 or an equivalent course. 9 semester hours in courses related to Communication Studies in one department other than COMM
  - c. Public Relations JOUR 201 and 202; COMM 350, 351, 352, 386 (only 3 credits apply to major), and 483. 3 semester hours in COMM at the 300-400 level One course from the following (Statistical Analysis): PSYC 200, SOCY 201, BMGT 230, EDMS 451 or an equivalent course One course from the following (Economics): ECON 200 or 201 9 semester hours in courses related to Public Relations in one department other than COMM or JOUR
  - d. Rhetoric and Public Discourse COMM 450  
Five courses from the following: COMM 330, 360, 451, 453, 455, 460, 461, 469, 471, 476. 6 semester hours in COMM at least three of which must be at the 300-400 level One course from the following (Critical Analysis of Discourse): AMST 432, CMLT 488, ENGL 453, JWST 263, PHIL 233 One course from the following (Structural Analysis of Language): LING 200, HESP 120, ANTH 380 or an equivalent course 9 semester hours in course related to Rhetoric and Public Discourse in one department other than COMM

Because the department's curriculum changes over time, the department's Undergraduate Director may approve other appropriate Communication courses to meet the requirements for each track.

Courses required for the Communication major but taken outside COMM may be used to satisfy CORE requirements.

Communication offers special opportunities for majors. Superior students may participate in an Honors Program; contact the Honors Director. The department sponsors a chapter of Lambda Pi Eta National Honor Society. An internship program is also available to students doing work related to the major; contact the outreach coordinator. **Note:** COMM386, only 3 credits apply to major.

Course Code: COMM

## COMPARATIVE LITERATURE PROGRAM (CMLT)

### College of Arts and Humanities

2107 Susquehanna Hall, 405-2853

#### Core Faculty

Acting Director: Mossman\* (French and Italian)

Professors: Collins\* (English), Fuegi, Harrison\* (Spanish and Portuguese)

Associate Professor: Wang\*(English)

Instructor: Robinson

Visiting Assistant Professor: Conroy\* (American Studies)

\*Joint appointment with unit indicated

†Distinguished Scholar-Teacher

#### Affiliate Faculty

Professors: Alford, Auchard, Barry, Bedos-Rezak, Bolles, R. Brown, Caramello, Caughey, Chambers, Coogan, Cross, Cypess, Donawerth, Fahnestock, Flieger, Grossman, Hallett, Kauffman, Kelly, Leinwand, Leonardi, M. Smith, Pearson, Robertson, Turner

Associate Professors: Brami, J. Brown, Cate, Cohen, Coustaut, Doherty, Falvo, Igel, Kerkham, King, Kuo, Mintz, Norman, Peres, Ray, Richardson, Sherman, Strauch, Williams, Withers, Zilfi

## The Major

A pre-structured Individual Studies major is available through Undergraduate Studies. This major requires competence in a second language and may emphasize either literature or media. Undergraduates may also emphasize comparative studies in literature, culture, and/or media as they work toward a degree in another department associated with the Comparative Literature Program.

## Citation in Comparative Studies

A student who specializes in 15-16 hours of concentrated study in the courses of the Comparative Literature Program will receive a citation on the official transcript. Please contact the Director of Undergraduate Studies for approval of courses.

Course Code: CMLT

## COMPUTER ENGINEERING (ENCP)

### A. James Clark School of Engineering

#### Department of Electrical and Computer Engineering

2429 A.V. Williams Building, (301) 405-3685

E-mail: eceadv@deans.umd.edu

[www.ece.umd.edu](http://www.ece.umd.edu)

Chair: Marcus

Professors: Agrawal, Aloimonos, Basili, Chellappa, Davis, DeClaris, Elman, Gasarch, Gligor, Hendler, Jaja, Minker, Mount, Nakajima, Nau, O'Leary, Oruc, Perlis, Pugh, Reggia, Roussopoulos, Samet, Shankar, Shneiderman, Smith, Stewart, Subrahmanian, Vishkin, Zelkowitz

Associate Professors: Bhattacharyya, Door, Franklin, Holingsworth, Jacobs, Keleher, Khuller, Kruskal, Porter, Purlito, Silio, Srinivasan, Tseng, Varshney  
Assistant Professors: Arbaugh, Barua, Bederson, Bhattacharjee, Chawathe, Foster, Getoor, Hicks, Iftode, Jacob, Katz, Memon, Sussman, Yeung  
Emeriti: Chu, Kanal, Ligomenides, Miller, Minker, Pugsley, Rosenfeld

# 100 Computer Engineering

## The Major

The computer engineering major combines the strengths of both the Department of Electrical and Computer Engineering and the Department of Computer Science to prepare students for careers in the computer industry. The program encompasses the study of hardware, software, and systems questions that arise in the design development, and application of computers and embedded systems. Specifically, computer engineering students will have a knowledge of hardware systems (electrical networks, electronics, and VLSI); a knowledge of software systems (algorithms, data structures, and operating systems); and a knowledge of how these two domains interact (digital logic, signal and system theory, computer architectural and performance analysis). Computer Engineering students will learn about everything that goes into digital and computing systems, from solid state physics to CMOS VLSI design, to computer architecture to programming, and from operating systems to compiler and language theory.

The following are the objectives of the Computer Engineering Degree Program:

1. Provide all students with basic training in computer engineering, as well as opportunities for specialized training in several technical areas;
2. Prepare students for study in the nation's top graduate schools and/or employment in a variety of positions in government and industry;
3. Through such tools as honors courses, research programs and financial aid packages, facilitate the recruitment and retention of a diverse student body, with particular emphasis on historically underrepresented groups;
4. Provide students with an understanding of the social context of the computer engineering profession;
5. Provide students with an understanding of the ethical responsibilities of practicing engineers, as stipulated in the IEEE Code of Ethics;
6. Provide students with an ability to communicate and defend their ideas effectively;
7. Provide students with the skills necessary for successful participation in interdisciplinary projects;
8. Provide students with an ability to identify engineering problems and propose appropriate solutions, including the step-by-step design of a system, component or process;
9. Provide students with a strong foundation in mathematics, sciences and engineering, and the ability to apply said knowledge to solving engineering problems;
10. Provide students with an ability to design and conduct experiments, interpret empirical observations and analyze data;
11. Provide students with opportunities to engage in structured research activities;
12. Maintain technological relevance by introducing students to current applications in the field, as well as to state-of-the-art laboratory equipment and computer simulation tools;
13. Provide students with a motivation to seek further specialization in the field of computer engineering, and to continue learning, whether in a formal academic setting or through self-instruction.

## Requirements for Major

Computer Engineering is a limited enrollment program that has special requirements for admission and a 45-credit review. See The Department for details.

As in all engineering degrees, the student starts out with a core curriculum in mathematics and basic science. Subsequent years of study involve courses covering a balanced mixture of hardware, software, hardware-software trade-offs, and basic modeling techniques used to represent the computing process. Courses covering algorithms, data structures, digital systems, computer organization and architecture, software and hardware design and testing, operating systems, and programming languages will be included. Elective courses must include electrical engineering and computer science courses and technical courses outside the departments. A sample program is shown below.

	Semester Credit Hours	
	I	II
<b>Freshman Year</b>		
CORE—General Education**	3	3
CHEM 135—General Chemistry for Engineers	3	
PHYS 161—General Physics	3	3
MATH 140, 141—Calculus I, II	4	4
CMSC 114—Computer Science I*	4	
ENES 100—Intro. To Engineering Design	3	
<b>Total Credits</b>	<b>13</b>	<b>14</b>

## Sophomore Year

CORE—General Education**	3	
MATH 246—Differential Equations	3	
CMSC 214—Computer Science II	4	
CMSC 250—Discrete Structure	4	
CMSC 251—Algorithms	3	
PHYS 262—General Physics II	4	
ENEE 241—Numerical Techniques	3	
ENEE 204—Basic Circuit Theory	3	
ENEE 206—Fundamental Lab	2	
ENEE 244—Digital Logic Design	3	
<b>Total Credits</b>	<b>15</b>	<b>17</b>

## Junior Year

CORE—General Education**	3	6
CMSC 330—Organization of Prog. Languages	3	
CMSC 412—Operating Systems	4	
ENEE 302—Digital Electronics	3	
ENEE 322—Signal and System Theory	3	
ENEE 324—Engineering Probability	3	
ENEE 350—Computer Organization	3	
ENEE 446—Computer Design	3	
<b>Total Credits</b>	<b>15</b>	<b>16</b>

## Senior Year

CORE—General Education**	3	3
Electives	14	10
<b>Total Credits</b>	<b>17</b>	<b>13</b>

\*Students may need to take CMSC 106, Introduction to C Programming, or the computer science exemption exam before taking CMSC 114.

See the GENERAL EDUCATION REQUIREMENTS (CORE) for details about CORE program requirements.

\*\*Note: This sample schedule assumes at least one of the CORE Distributive Studies classes also satisfies the CORE Cultural Diversity requirement.

## Computer Engineering Majors

### New Technical Elective Requirements\*

Effective Spring 2001, all BSCP graduates must distribute their 24 credits of technical electives among the following course categories:

- Category A. Mathematics and Basic Science Electives: minimum of 6 credits
- Category B. Computer Science Theory and Applications: minimum of 3 credits
- Category C. Electrical Engineering Theory and Applications: minimum of 3 credits
- Category D. Advanced Laboratory: minimum of 2 credits
- Category E. Capstone Design: minimum of 3 credits
- Category F. Engineering (not Electrical or Computer): 3 credits

Please read carefully, and make a note of, the following special cases and other items:

1. Two credits of ENEE 499, Senior Projects in Electrical and Computer Engineering, may be used to satisfy the Advanced Laboratory requirement subject to approval by the faculty supervisor and the Associate Chair. The maximum number of ENEE 499 credits that may be applied towards EE technical elective requirements is five.
2. Additional Capstone Design courses can be used as substitutes for the required Electrical Engineering Theory and Applications course; and/or the required Advanced Laboratory course, provided one of the following is completed: ENEE 408A, 408B, 408C, or 408F.
3. Completion of ENEE 408A and ENEE 459A satisfies both the Capstone Design and Advanced Laboratory requirements.
4. There is no longer a requirement that students complete a total of seven design credits, hence there is no need to consult the list of design credits for each course.
5. If you have any questions on how these requirements affect your current selection of technical electives, please contact an advisor.

\*Subject to approval by the Vice President's Advisory Committee

## Admission

Admission requirements are the same as those of other departments in the School of Engineering. (See A. James Clark School of Engineering section on Entrance Requirements.) Computer Engineering is a highly selective program and only a limited number of students are admitted each academic year.

## Advising

In addition to the ECE Office, faculty in Computer Engineering function as undergraduate advisers. Departmental approval is required for registration in all upper-division courses in the major. The department's Undergraduate Office (2429 A.V. Williams Building, 301-405-3685) is the contact point for undergraduate advising questions.

## Cooperative Education Program

Participation in the Cooperative Education Program is encouraged. See A. James Clark School of Engineering entry for details.

## Financial Assistance

Several corporate scholarships are administered through the Department. Information and scholarship applications are available from either the Department of Electrical and Computer Engineering Undergraduate Office, 2429 A.V. Williams Building, (301) 405-3685, or the Clark School of Engineering Student Affairs Office, 1124 Engineering Classroom Building, (301) 405-3855.

## Job Opportunities

Computer Engineers have virtually unlimited employment opportunities in both industry and government. Some of the specific jobs that students of computer engineering might acquire are: computer designer, application specialist, embedded system designer, interfacing and telecommunication designer, data logging and control, industrial systems design, hardware design, biomedical device design, real-time software design and development, instrumentation analysis and control, computer-integrated manufacturing.

## Research Labs

The Department of Electrical and Computer Engineering is affiliated with more than 40 specialized laboratories, supporting activities including: speech and image processing, high performance systems, mobile computing and multimedia, communication networks, robotics, control systems, neural systems, systems integration, VLSI design and testing, experimental software engineering, semiconductor materials and devices, photonics, fiber optics, ion beam lithography, real-time systems, human-computer interaction, and virtual reality.

## Student Organizations

Please see listing for ENEE

**Courses** (see full descriptions in chapter 8)

CMSC 114—Computer Science I (4)  
 CMSC 214—Computer Science II (4)  
 CMSC 250—Discrete Structures (4)  
 CMSC 330—Organization of Programming Languages (3)  
 CMSC 351—Algorithms (3)  
 CMSC 412—Operating Systems (4)  
 ENEE 204—Basic Circuit Theory (3)  
 ENEE 206—Fundamental Electric and Digital Circuit Laboratory (2)  
 ENEE 241—Numerical Techniques in Engineering (3)  
 ENEE 244—Digital Logic Design (3)  
 ENEE 302—Digital Electronics (3)  
 ENEE 322—Signal and System Theory (3)  
 ENEE 324—Engineering Probability (3)  
 ENEE 350—Computer Organization (3)  
 ENEE 446—Digital Computer Design (3)

Course Codes: ENEE, CMSC

## COMPUTER SCIENCE (CMSC)

### College of Computer, Mathematical and Physical Sciences

1119 A.V. Williams Building, (301) 405-2672

E-mail: ugrad@cs.umd.edu

[www.cs.umd.edu](http://www.cs.umd.edu)

Professor and Chair: Davis

Professors: Agrawala, Aloimonos, Basili, Elman, Gasarch, Hendler, Mount, Nau, O'Leary, Perlis, Pugh, Reggia, Roussopoulos, Samet, Shankar, Shneiderman, Smith, Stewart, Subrahmanian, Zelkowitz

Associate Professors: Dorr, Hollingsworth, Jacobs, Keleher, Khuller, Kruskal, Porter, Purtilo, Srinivasan, Tseng, Varshney

Assistant Professors: Arbaugh, Bederson, Bhattacharjee, Chawathe, Foster, Getoor, Hicks, Iftode, Katz, Memon, Sussman

Instructor: Golub, Plane

Lecturers: Arras, Emad, Herman, Hugue, Kaye, Lin, Maybury, Padua-Perez, Postow, Scolnik, Tjaden

Professors Emeriti: Chu, Kanal, Miller, Minker, Rosenfeld

## The Major

Computer science is the study of computers and computational systems: their theory, design, development, and application. Principal areas within computer science include artificial intelligence, computer systems, database systems, human factors, numerical analysis, programming languages, software engineering, and theory of computing. A computer scientist is concerned with problem solving. Problems range from abstract determinations of what problems can be solved with computers and the complexity of the algorithms that solve them to practical matters (design of computer systems which are easy for people to use). Computer scientists build computational models of systems including physical phenomena (weather forecasting), human behavior (expert systems, robotics), and computer systems themselves (performance evaluation). Such models often require extensive numeric or symbolic computation.

The Computer Science Department also offers jointly with the Department of Electrical and Computer Engineering a program in computer engineering. For details see the Computer Engineering listing.

## Requirements for Computer Science Major

The course of study for a Computer Science major must include all of the following requirements:

1. A grade of C or better in each of the following courses:
  - a. CMSC 106 or acceptable score on the appropriate Department exemption examination, which is to be taken at the time of entry into the program.
  - b. CMSC 114 or acceptable score on the C++ Advanced Placement examination or acceptable score on the appropriate Department exemption examination, which is to be taken at the time of entry into the program.
  - c. CMSC 214 or acceptable score on the appropriate Department exemption examination, which is to be taken at the time of entry into the program.
  - d. CMSC 250 or acceptable score on the appropriate Department exemption examination, which is to be taken at the time of entry into the program.
  - e. At least 27 credit hours at the 300-400 levels. These must include CMSC 311, CMSC 330, CMSC 351, and at least 15 credit hours from the following CMSC courses:
    - Computer Systems: Up to two of 411, 412, 414, 417
    - Information Processing: 420, one of 421 or 424 or 426 or 427;
    - Software Engineering/Programming Languages: Up to two of 430, 433, 434, 435;
    - Algorithms and Computation Theory: 451, one of 452 or 456;
    - Numerical Analysis: One of 460 or 466.

Note: Courses in Numerical Analysis require MATH 240 and 241 as additional prerequisites. Students without either of these prerequisites must choose their 15 credit hours from the remaining courses in the other four areas.
2. MATH 140 and 141 (or MATH 350, 351). A STAT course which has MATH 141 (or a more advanced mathematics course) as a prerequisite, and one other MATH, STAT, or AMSC course which has MATH 141 (or a more advanced mathematics course) as a prerequisite. A grade of C or better must be earned in each of the courses. No course that is cross-listed as CMSC may be counted in this requirement.

## 102 Counseling and Personnel Services

- A minimum of 12 additional credit hours of 300-400 level courses in one discipline outside of computer science with an average grade of C or better. No course that is cross-listed as CMSC may be counted in this requirement.

### Advising

Computer science majors may obtain advising at room 1119 A.V. Williams Building. Interested students should call (301) 405-2672 to receive further information about the program. Additional information can be found at [www.cs.umd.edu/ugrad/](http://www.cs.umd.edu/ugrad/)

### Financial Assistance

Students may find employment as tutors, as undergraduate teaching assistants, or as members of the department's laboratory staff. Professors may also have funds to hire undergraduates to assist in research. Many students also participate in internship or cooperative education programs, working in the computer industry for a semester during their junior or senior years.

### Honors

A departmental honors program provides an opportunity for outstanding undergraduates to take graduate-level courses or to begin scholarly research in independent study with a faculty member. Students are accepted into the program after their sophomore year based on their academic performance.

### Student Organizations

Computer-related extracurricular activities are arranged by our student chapter of the ACM, a professional group for computer sciences, and by the Association of Women in Computing. Meetings include technical lectures and career information.

Course Code: CMSC

## COUNSELING AND PERSONNEL SERVICES (EDCP)

### College of Education

3214 Benjamin Building, (301) 405-2858  
[www.education.umd.edu/EDCP](http://www.education.umd.edu/EDCP)

Professor and Chair: Kivlighan

Professors: Birk (Emeritus), Byrne (Emeritus), Hershenson (Emeritus), Lent, Magoon (Emeritus), Marx (Emeritus), Power (Emeritus), Pumroy (Emeritus), Rosenfield, Schlossberg (Emeritus), Hoffman, Sedlacek (Affiliate)

Associate Professors: Boyd, Clement (Affiliate), Fabian, Fassinger, Greenberg (Emeritus), Jacoby (Affiliate), Komives, McEwen, Strein, Teglas, Westbrook (Affiliate)

Assistant Professors: Adams-Gaston (Affiliate), Bagwell (Affiliate), Fallon (Affiliate), Flannery (Affiliate), Freeman (Affiliate), Gast (Affiliate), Holcomb-McCoy, Kandell (Affiliate), Kiely (Affiliate), Lucas, Mielke (Affiliate), Osteen (Affiliate), Phillips, Schmidt (Affiliate), Stewart (Affiliate), Stimpson (Affiliate), Thomas (Affiliate), Zacker (Affiliate)

The Department of Counseling and Personnel Services offers programs of preparation at the master's degree, advanced graduate specialist, and doctoral degree levels for counselors in elementary and secondary schools, rehabilitation agencies, business and industry, and college and university counseling centers. Additional graduate programs of preparation are provided for college student personnel administrators and school psychologists. The department also offers a joint doctoral program with the Department of Psychology in counseling psychology.

While the department does not have an undergraduate major, it does offer a number of courses which are open to undergraduates and are suggested for students considering graduate work in counseling or other human service fields. Specific courses in peer counseling, leadership, and diversity are provided.

Course Code: EDCP

## CRIMINOLOGY AND CRIMINAL JUSTICE (CCJS)

### College of Behavioral and Social Sciences

2220 LeFrak Hall, (301) 405-4699

Chair: Wellford

Professors: Gottfredson, LaFree, Laub, MacKenzie, Paternoster<sup>†</sup>, Reuter, Sherman (Research), Simpson, Smith, Weisburd

Associate Professors: Russell, Taxman (Research), Wish

Assistant Professors: Bushway, Dugan

Lecturers: Carr, Cosper, Gaston, Goode, Malm, Mauriello, Zumbrun

Professor Emeritus: Lejins\* (Sociology)

Instructor: Brooks

<sup>†</sup>Distinguished Scholar-Teacher.

\*Joint Appointment with unit indicated.

The purpose of the Department of Criminology and Criminal Justice is to promote study and teaching concerning the problems of crime, delinquency, law and social control. The department comprises as its component parts:

- The Criminology and Criminal Justice Program, leading to a Bachelor of Arts degree
- The Graduate Program, offering M.A. and Ph.D. degrees in Criminology and Criminal Justice
- The Graduate Program, offering a Professional M.A. in Criminal Justice

### The Criminology and Criminal Justice Major

The major in criminology and criminal justice comprises 30 hours of coursework in Criminology and Criminal Justice. Eighteen (18) hours of supporting sequence selected from a list of social and behavioral science courses (list is available in the department) are required. No grade lower than a C may be used toward the major. An average of C is required in the supporting sequence. Nine hours of the supporting sequence must be at the 300/400 level. In addition, CCJS 200 or an approved course in social statistics must be completed with a grade of C or better. A "C" or better is required in Math 111 as a prerequisite to CCJS 200.

Major Requirements	Semester Credit Hours
CCJS 100: Introduction to Criminal Justice.....	3
CCJS 105: Criminology .....	3
CCJS 230: Criminal Law in Action .....	3
CCJS 300: Criminological and Criminal Justice Research Methods .....	3
CCJS 340: Concepts of Law Enforcement Administration .....	3
CCJS 350: Juvenile Delinquency .....	3
CCJS 451, 452, or 454 .....	3
CCJS Electives (3) .....	9
<b>Total .....</b>	<b>30</b>

Supporting Sequence	Credit Hours
18 hours (9 hours at 300/400 level) .....	18
Social Science Statistics .....	3
<b>Total for Major and Supporting .....</b>	<b>51</b>

Electives for CCJS Majors (all courses are 3 credits):

CCJS 234, CCJS 320, CCJS 330, CCJS 331, CCJS 352, CCJS 357, CCJS 359, CCJS 360, CCJS 398, CCJS 399, CCJS 400, CCJS 432, CCJS 444, CCJS 450, CCJS 451, CCJS 452, CCJS 453, CCJS 454, CCJS 455, CCJS 456, CCJS 457, CCJS 461, CCJS 462, and CCJS 498.

**Note: Criminal Justice (CJUS) majors and Criminology (CRIM) majors, which existed prior to 1992, have requirements different from the ones outlined here for Criminology and Criminal Justice (CCJS) majors. CJUS and CRIM majors are strongly urged to speak to a CCJS academic adviser regarding their requirements.**

### Internships

Internships are available through CCJS 398 and CCJS 359 in a variety of federal, state, local, and private agencies. A GPA of 2.5 and 56 credit hours required for internships.

## Honors

Each semester the department selects the outstanding graduating senior for the Peter P. Lejins award.

The Honors Program provides superior students the opportunity for advanced study in both a seminar format and independent study under the direction of the faculty. The Honors Program is a three-semester (12-credit-hour) sequence that a student begins in the spring semester, three or four semesters prior to graduation. CCJS 388H, the first course in the sequence, is offered only during the spring semester. The second and third courses in the sequence consist of a year-long research project (six credits, at least three each semester) or an honors thesis (one semester, six credits) followed by a graduate seminar in the department (one semester, three credits). Honors students may count their Honors courses toward satisfaction of the basic 30-hour requirement. Requirements for admission to the Honors Program include a cumulative grade-point average of at least 3.25, no grade lower than B for any criminology and criminal justice course, and evidence of satisfactory writing ability.

## Advising

All majors are strongly encouraged to see an adviser at least once each semester. Call (301) 405-4729.

Course Code: CCJS

## CURRICULUM AND INSTRUCTION (EDCI)

### College of Education

2311 Benjamin Building, (301) 405-3324  
[www.education.umd.edu/EDCI](http://www.education.umd.edu/EDCI)

Professors: Afflerbach, Dreher, Fey\* (Mathematics), Holliday, Johnson, Oxford, Saracho, Weible

Associate Professors: Campbell, Chambliss, Chazan, Cirrincione\* (Geography), Graeber, Hammer\* (Physics), Kushner, McCaleb\* (Speech), McGinnis, O'Flahavan, Price, Slater, Sullivan, Valli, Van Sledright, Van Zee

Assistant Professors: Cozart, Lynn, Suarez  
 Emeriti: Amershek, Blough, De Lorenzo, Duffey, Eley, Folstrom, Heidelbach, Henkelman, Jantz, Layman, Lockard, Roderick, Schindler, Stant, Weaver, Wilson,

\*Joint appointment with unit indicated

## The Major

The Department of Curriculum and Instruction offers two undergraduate curricula leading to the Bachelor of Science or Bachelor of Arts degree:

1. Elementary Education: for the preparation of teachers of grades 1-6 and middle school, and
2. Secondary Education: for the preparation of teachers in various subject areas for teaching in middle schools and secondary schools, grades 7-12.

All secondary education majors are required to have an academic content major.

The Department now has multiple pathways for students who are interested in teaching at the secondary level. In addition to the dual majors, there are citation, certificate, and BS/MS Fast Track Certification Program options:

The **Citation Option**, which is intended for sophomores and juniors in a content major, permits potential teacher candidates to enroll in a sequence of education courses that helps them to determine if teaching is a viable career option for them. The twelve to eighteen credit citation option may be taken prior to admission into a teacher preparation program. A selected twelve credits also may count toward the certificate in secondary education or the dual major for those students who elect to pursue teacher certification in secondary education. Students who successfully complete four citation courses but who do not move into one of these two certification paths will receive a citation at the time of graduation.

The **Certificate Program**, which is designed for sophomores, juniors, and seniors in a content major, requires a major and Bachelor's degree in an approved academic content area, plus the completion of a certificate program for secondary education. Selected course work from the citation

option may be taken prior to admission into the certificate option with up to twelve credits counting towards the certificate in secondary education. The certificate program leads to state approved certification as a secondary teacher in one of the approved content areas.

The **BS/MS Fast Track Certification Program**, which is intended for content majors entering the junior or senior year, is for talented students with a minimum GPA of 3.0 who enroll in a Bachelor's degree program in a content area and elect to continue in a Master's level program leading to certification in secondary education. Nine credits of the program may count for both the Bachelor's and Master's degrees. Prior approval is required for students electing this option. This program can be completed in two semesters following the completion of the Bachelor's degree. Changes in the requirements for the Fast Track program are under review. Students should contact the Office of Student Services (1204 Benjamin Bldg., for updated information).

Detailed information about these secondary education program options is available at the College of Education website, [www.education.umd.edu](http://www.education.umd.edu).

Graduates of the Elementary or Secondary Education programs meet the requirements for certification in Maryland and most other states.

## Requirements for Major Including Program Options

All Teacher Education Programs have designated pre-professional courses and a specified sequence of professional courses. Before students may enroll in courses identified as part of the professional sequence, they must complete the selective admission requirements and be fully admitted to the College of Education's Teacher Education Program. An overall grade point average of 2.5 must be maintained after admission to Teacher Education. All teacher candidates are required to attain qualifying scores for the State of Maryland on the Praxis I and Praxis II assessments. Praxis I is required for admission, and Praxis II is required for student teaching and graduation. Student teaching is a yearlong internship, which takes place in a Collaborating School (i.e., partner school, PDS - Professional Development School). For more information regarding student teaching, see the College of Education entry in Chapter Six.

## Admission

Admission to the Teacher Education Professional Program is competitive. Admission procedures and criteria are explained in the College of Education entry in Chapter Six.

## Advising

Advising is mandatory for all students. Students receive advising through individual appointments or walk-in hours during the early registration period. Information regarding advising schedules is available each semester. Walk-in advising hours are also posted each semester. Check in the department office, 2311 Benjamin Building.

## ELEMENTARY EDUCATION (Grades 1-6 and Middle School)

Students who complete the elementary education curriculum receive the Bachelor of Science degree and meet the Maryland State Department of Education requirements for the Professional Eligibility Certificate in Elementary Education. Students admitted to Elementary Education must complete the following program, which includes an **Area of Emphasis**.

The **Gateway Requirements** for entrance into the Elementary Teacher Education program include:

- Biological science/lab (4)
- Physical science/lab (4)
- Math 210 (4)
- Math 211 (4)
- EDCI 280 (3) (minimum grade, B)

The 16 credits of math and science must be completed with a GPA of 2.75.

**Courses which double count with CORE:** Courses which may satisfy the university's general education requirements (CORE) and which are required in the Elementary Education program of studies follow:

- HIST 156 (3) Social and Political History
- Biological Science/Lab and Physical Science/Lab Gateway Requirements (4,4)
- Social Science: (3) (Recommended course options: GEOG 100, GVPT 170, SOCY 100, or PSYC 100)

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### Other Pre-Professional Requirements:

EDCI301 or ARTT 100 or ARTT 110 (3)  
EDCI 443 (3)  
MUSC 155 (3)  
SOCY 230 (3) or PSYC 221 (3)  
EDMS 410 (3)  
EDPL 301 (3)  
EDHD 411—Child Growth and Development (3) (typically taken with the course work listed under Professional Semester 1)  
EDHD 425—Language Development and Reading Acquisition (3) (typically taken with the course work listed under Professional Semester 1)

Course work to complete the **Area of Emphasis (18 semester hours)** can be chosen from the following areas: Communication, Foreign Language, Literature, Mathematics, Science, and Social Studies. The EDCI Advising Office has detailed information regarding each area of emphasis. All pre-professional course work must be completed with a C or better prior to entering Professional Semester 2.

### Professional Education Courses:

#### Professional Semester 1

EDCI 397—Principles and Methods of Teaching in Elementary Schools (3)  
EDCI 385—Computers for Teachers (3)  
EDCI 461—Materials for Creating Skilled and Motivated Readers (K-6) (3) (Students typically take EDHD 425 and EDHD 411 as part of Professional Semester 1.)

#### Professional Semester 2

EDCI 322—Curriculum and Instruction in Elementary Ed.: Social Studies (3)  
EDCI 342—Curriculum and Instruction in Elementary Ed.: Language Arts (3)  
EDCI 352—Curriculum and Instruction in Elementary Ed.: Mathematics (3)  
EDCI 362—Curriculum and Instruction in Elementary Ed.: Reading (3)  
EDCI 372—Curriculum and Instruction in Elementary Ed.: Science (3)  
EDCI 488—Classroom Management (1)

#### Professional Semester 3

EDCI 481—Student Teaching: Elementary (12) – 16 weeks  
EDCI 464—Reading Instruction and Diagnosis across Content Areas (3)

All pre-professional and professional courses must be completed with a grade of C or better. All CORE and pre-professional requirements, as well as the courses listed for Professional Semester 1, must be successfully completed prior to enrollment in the year-long internship (Professional Semesters 2 and 3). The courses listed for Professional Semester 2 must be completed with a C or better prior to enrolling in Professional Semester 3.

## SECONDARY EDUCATION PROGRAMS

The Department offers a variety of secondary education programs leading to the Bachelor of Science and Bachelor of Arts degrees. Students who complete a secondary education program at UMCP meet the Maryland State Department of Education requirements for the Professional Eligibility Certificate.

### Foreign-Language Requirement, Bachelor of Arts Degree

Language proficiency may be demonstrated in one of several ways:

- Successful completion of level 4 in one language. Students must provide a high school transcript to verify exemption.
- Successful completion of an intermediate-level college foreign language course designated by the department.
- Successful completion of a language placement examination in one of the campus language departments offering such examinations.

Students who have native proficiency in a language other than English should see an adviser in the EDCI advising office, room 2311 Benjamin.

### Art Education (pre K-12)

The Art Education curriculum is designed to prepare students to teach art in elementary and secondary schools. It provides prospective art teachers with a knowledge base about the theories and best practices relevant to effective pedagogy, as well as current education and art education goals and standards. Students admitted to Art Education complete the Bachelor of Arts and are required to have an academic content major.

For more information on the sequence of pre-professional and professional courses, consult the College of Education, Department of Curriculum and Instruction's advising office.

### Pre-Professional/Subject Area Courses

**Note:** Course Sequencing is under review.

ARTT 150—Introduction to Art Theory (3)  
ARTT 100—Two Dimensional Art Fundamentals (3)  
ARTT 110—Elements of Drawing I (3)  
ARTH 200—Art of the Western World to 1300 (3)  
ARTH 201—Art of the Western World after 1300 (3)  
ARTT 200—Three-Dimensional Art Fundamentals (3)  
ARTT 210—Elements of Drawing II (3)  
ARTT 320—Elements of Painting (3)  
ARTT 418—Drawing (3)  
ARTT 428—Painting (3)  
EDCI 407—Practicum in Art Education: Three Dimensional (3) (Spring only)  
ARTT 340—ARTT 341, ARTT 342, ARTT 343, ARTT 344—Elements of Printmaking: Intaglio (3)

### Pre-Professional/Education Courses

EDHD 413—Adolescent Development (3)  
EDHD 426—Cognition & Motivation in Reading: Reading in Content Areas I (3)  
EDPL 301—Foundations of Education (3)  
EDCI 463—Reading in the Secondary School (3)

### Professional Education Courses

EDCI 300—Discipline Based Art Education (C&I Art Methods) (3) (Spring only)  
EDCI 373—Practicum in Ceramics (3) (Spring only)  
EDSP 470—Introduction to Special Education (3)  
EDCI 403—Teaching of Art Criticism in Public Schools (3) (Spring only)  
EDCI 400—Field Experience in Art Education (1) (Fall only)(taken concurrently with EDCI 405)  
EDCI 405—Discipline-Based Art Education Methods II (3) (Fall only)  
EDCI 406—Computers, Art, and Chaos Theory (3) (Fall only)  
EDCI 401—Student Teaching in Elementary School: Art (6)  
EDCI 402—Student Teaching in Secondary Schools: Art (6)  
EDCI 404—Student Teaching Seminar (3)

## English Education (Grades 7-12)

Students who complete the English Education curriculum receive the Bachelor of Arts degree and meet the MSDE requirements for the Professional Eligibility Certificate. Students admitted to English Education are required to have an academic content major and must complete the following program requirements:

### Pre-Professional/Subject Area Courses

COMM107—Oral Communication: Principles and Practices, or COMM125—Introduction to Interpersonal Communication, or COMM220—Small Group Discussion (3)  
COMM230—Argumentation and Debate or COMM330—Argumentation and Public Policy or COMM383—Urban Communication or COMM402—Communication Theory and Process (3)  
Foreign Language (Intermediate mastery of a modern or classical language is required.) (8 credits)  
LING200—Introductory Linguistics (3) or ENGL280 (3)  
ENGL101—Introduction to Writing or ENGL101H—Honors Composition (3) (If exempt from ENGL101, majors are required to take ENGL291—Intermediate Writing or ENGL294—Introduction to Creative Writing.)  
ENGL201—Western World Literature, Homer to the Renaissance, or ENGL202—Western World Literature, Renaissance to the Present (3)  
ENGL301—Critical Methods in the Study of Literature (3)  
ENGL304—The Major Works of Shakespeare or ENGL403—Shakespeare: The Early Works or ENGL404—Shakespeare: The Later Works (3)

British and American Literature: one upper-level course in five out of the following six areas to be taken during the sophomore and junior years (15 credits total; one of these five courses must be in American Literature):

- Medieval Literature
- Renaissance Literature other than Shakespeare
- Restoration or 18th Century Literature
- 19th Century British Literature
- American Literature before 1900
- 20th Century British or American Literature

ENGL384—Concepts of Grammar or ENGL383—The Uses of Language or ENGL385—English Semantics or ENGL482—History of the English Language (or ENGL483, 484, 486, 489)  
ENGL391—Advanced Composition or ENGL393—Technical Writing or

ENGL493—Advanced Expository Writing  
 ENGL399—Senior Seminar (3)  
 ENGL487—Foundations of Rhetoric or COMM360—The Rhetoric of Black America or COMM401—Interpreting Strategic Discourse or COMM453—The Power of Discourse in American Life (3)  
 ENGL Elective—Women or minority course (3)

#### Pre-Professional/Education Courses

EDPL301—Foundations of Education (3)  
 EDHD413—Adolescent Development (3)  
 EDHD426—Cognition & Motivation in Reading: Reading in Content Areas I (3)  
 EDCI463—Reading in the Secondary School (3)

#### Professional Education Courses

EDCI466—Literature for Adolescents (3)  
 EDCI467—Teaching Writing (3)  
 EDCI417—Bases for English Language Instruction (3)  
 EDCI340—Curriculum and Instruction in Secondary Education: English, Speech, Theater (3) (Fall only)  
 EDCI447—Field Experience in English Teaching (concurrent with EDCI340) (1)  
 EDCI440—Student Teaching Seminar in Secondary Education: English (concurrent with EDCI441) (1)  
 EDCI441—Student Teaching in Secondary Schools: English (12)

For more information on the sequence of pre-professional and professional courses, consult the College of Education, Department of Curriculum and Instruction (Room 2311, Benjamin).

## Foreign Language Education (Grades 7-12)

The Foreign Language (FL) Education curriculum is designed for prospective foreign language teachers in grades 7-12 who have been admitted to the EDCI Teacher Education Program. Currently, admission is open to qualified students seeking teacher certification in Spanish, French, Russian, and German. Other languages might be added later for teacher certification. Students enrolled in foreign language education are required to have an academic content major. The foreign language education programs are under review. Consult with an advisor in the Department of Curriculum and Instruction for further information.

A minimum of six hours of intermediate-level language course work in the student's major language must precede the required 300-400 level courses. The latter are comprised of a minimum of 30 hours of prescribed course work that includes the areas of reading strategies, grammar and composition, conversation, literature, civilization and culture, and linguistics. Students must also take a minimum of nine hours (three courses) of electives in a related area. The second area of concentration must be approved by a FL advisor.

The following requirements must be met with the FL Education program:

#### Pre-Professional/Subject Area Courses

Primary FL Area—Intermediate (200 level) (3,3)  
 Primary FL Area—Reading Strategies (3)  
 Primary FL Area—Grammar and Composition (300-400 levels) (3,3)  
 Primary FL Area—Survey of Literature (300-400 levels) (3,3)  
 Primary FL Area—Conversation (300-400 levels) (3)  
 Primary FL Area—Literature (400-above levels) (3,3)  
 Primary FL Area—Culture and Civilization (3,3)  
 Applied Linguistics (in the Primary FL Area if available; otherwise, LING 200 or ANTH 371—FL Phonetics may satisfy this requirement; check with your advisor). (3)  
 Electives in Supporting Area/FL-Related Courses (9 hours-minimum of three courses).

In almost all instances, Primary FL Area courses must have been completed prior to the Student Teaching semester. Any substitutions for the above must be pre-approved by a FL Education Advisor.

Note: The pre-professional courses vary by subject area. Consult the academic department for the specific course requirements for each language area.

#### Pre-Professional/Education Courses

EDPL 301—Foundations of Education (3)  
 EDHD 413—Adolescent Development (3)  
 EDHD 426—Cognition & Motivation in Reading: Reading in Content Areas I (3)  
 EDCI 463—Reading in the Secondary School (3)

#### Professional Education Courses

EDCI 330—Curriculum and Instruction in Secondary Education: Foreign Language (3)  
 EDCI 433—Introduction to Foreign Language Methods (3)  
 EDCI 438—Field Experience in Second Language Education (1) (Fall only)  
 EDCI 430—Student Teaching Seminar in Secondary Education: Foreign Language (3)  
 EDCI 431—Student Teaching in Secondary Schools: Foreign Language (12)

## Mathematics Education (Grades 7-12)

Students who were accepted into the College of Education's Mathematics Education Program prior to January 2001 may complete the requirements for that major. Students who wish to be certified to teach mathematics at the secondary level and who have not yet been accepted into the College of Education must complete the requirements for the Mathematics Major – Secondary Education Track. The curriculum is under review. Please check with the mathematics department for specific math courses to be taken.

As of January 2001, the courses that must be taken in the College of Education are the following:

#### Pre-Professional/Education Courses

EDHD 413—Adolescent Development (3)  
 EDHD 426—Cognition & Motivation in Reading: Reading in Content Areas I (3)  
 EDPL 301—Foundations of Education (3)  
 EDCI 463—Reading in the Secondary School (3)

#### Professional Education Courses

EDCI 457—Teaching Secondary Students with Difficulties in Learning Mathematics (3)  
 EDCI 350—Curriculum and Instruction in Secondary Education: Mathematics (3) (Fall only)  
 EDCI 355—Field Experience in Secondary Mathematics Education (1) (Fall only)  
 EDCI 450—Student Teaching Seminar in Secondary Education: Mathematics (3)  
 EDCI 451—Student Teaching in Secondary Schools: Mathematics (12)

## Science Education (Grades 7-12)

The Science Education program is under review. Please check with the science department regarding specific course work.

Students may earn credentials in biology, chemistry, earth science, or physics. Beginning in 2001, all students admitted to the secondary program in science education must complete a major in their area of specialization. Students should consult the respective departments for requirements. (Students specializing in earth science must complete a major in geology). For more information, please see [education.umd.edu/science](http://education.umd.edu/science).

#### Pre-Professional Education Courses

EDPL 301—Foundations of Education (3)  
 EDHD 426—Cognition & Motivation in Reading: Reading in Content Areas I (3)  
 EDHD 413—Adolescent Development (3)  
 EDCI 463—Reading in the Secondary School (3)

#### Professional Education Courses

All areas of science education will be required to complete the following professional education courses:

EDCI 370—Curriculum & Instruction in Secondary Education: Science (3)  
 EDCI 375—Field Experience in Science Education (1)  
 EDCI 470—Practices of Teaching Science (3)  
 EDCI 471—Student Teaching in Secondary Schools: Science (12)

## Speech/English Education (Grades 7-12)

Students interested in teaching speech in secondary schools complete a minimum of 30 credits in speech and speech-related courses. Because most speech teachers also teach English classes, the program includes another 30 credits in English and English education. Upon selection of this major, students should meet with an advisor to carefully plan their programs. Communication is now a Limited Enrollment Program (LEP), and the Speech/English Education program is under review. Please check with the EDCI Advising Office, room 2311 Benjamin for specific course work.

In addition, intermediate mastery of a modern or classical language is required for a B.A.

## 106 Curriculum and Instruction

### Pre-Professional/Subject Area Courses

Speech Area (6): COMM 107—Oral Communication: Principles and Practices, COMM 125—Interpersonal Communication, COMM 220—Small Group Discussion, COMM 230—Argumentation and Debate, COMM 330—Argumentation and Public Policy, COMM 340—Communicating the Narrative, COMM 470—Listening  
COMM 200—Advanced Public Speaking (3)  
Film elective (3)  
HESP 202—Introduction to Hearing and Speech Sciences or HESP 305 or HESP 400 (3)  
THET 110—Introduction to Theatre (3)  
COMM 401—Interpreting Strategic Discourse (3)  
COMM 402—Communication Theory and Process (3)  
COMM Upper-level electives (6)  
Engl 101—Introduction to Writing (3)  
LING 200—Introductory Linguistics (3) or ENG 280 (3)  
ENGL 201—or 202 Western World Literature (3)  
ENGL 281—Standard English Grammar, Usage, and Diction or ENGL 383 or ENGL 384 or ENGL 385 or ENGL 482 or ENGL 484 (3)  
ENGL 301—Critical Methods in the Study of Literature or ENGL 453 (3)  
ENGL 310, 311 or 312—English Literature (3)  
ENGL 313, 430, 431, 432, 433—American Literature (3)  
ENGL 391 or 393—Advanced Composition or Technical Writing (3)

### Pre-Professional/Education Courses

EDPL 301—Foundations of Education (3)  
EDHD 413—Adolescent Development (3)  
EDHD 426—Cognition & Motivation in Reading: Reading in Content Areas I (3)  
EDCI 463—Reading in the Secondary School (3)

### Professional Education Courses

EDCI 417—Bases for English Language Instruction (3)  
EDCI 340—Curriculum & Instruction in Secondary Education: Eng/Spch/Theatre (3)  
EDCI 447—Field Experience in English, Speech, Theatre Teaching (I)  
EDCI 466—Literature for Adolescents (3)  
EDCI 467—Teaching Writing (3)  
EDCI 440—Student Teaching Seminar in Secondary Education: English, Speech, Theatre (1)  
EDCI 442—Student Teaching in Secondary Schools: Speech/English (12)

## Theatre/English Education (Grades 7-12)

The Theatre/English Education program is presently under revision. Please check with the EDCI Advising Office, room 2311 Benjamin for specific course work.

Students interested in teaching theatre in secondary schools complete a minimum of 30 credits in theatre and theatre-related courses. Because most theatre teachers also teach English classes, the program includes another 30 credits in English and English education. Upon selection of this major, students should meet with an adviser to carefully plan their programs.

In addition, intermediate mastery of a modern or classical language is required for a B.A.

### Pre-Professional/Subject Area Courses

THET 111—Theatre Art & Scholarship (3)  
THET 120—Acting I (3)  
THET 170—Theatre Craft I (3)  
THET 273—Scenographic Techniques or THET 476 or THET 480 (3)  
THET 330—Play Directing I (3)  
THET 460—Theatre Management I (3)  
THET 479—Theatre Workshop II (3)  
THET 490—Theatre History I (3)  
THET 491—Theatre History II (3)  
COMM 107—Oral Communication: Principles and Practices or COMM 200—or COMM 230 (3)  
ENGL 101—Introduction to Writing (3)  
LING 200—Introductory Linguistics (3) or ENGL 280  
ENGL 201 or 202—Western World Literature (3)  
ENGL 281—Standard English Grammar, Usage, and Diction or ENGL 383 or ENGL 384 or ENGL 385 or ENGL 482 or ENGL 484 (3)  
ENGL 310, 311, or 312—English Literature (3)  
ENGL 313—American Literature (3)  
ENGL 301—Critical Methods in the Study of Literature or ENGL 453 (3)  
ENGL 391 or 393—Advanced Composition or Technical Writing (3)

### Pre-Professional/Education Courses

EDHD 413—Adolescent Development (3)  
EDPL 301—Foundations of Education (3)  
EDHD 426—Cognition & Motivation in Reading: Reading in Content Areas I (3)  
EDCI 463—Reading in the Secondary School (3)

### Professional Education Courses

EDCI 417—Bases for English Language Instruction (3)  
EDCI 340—Curriculum & Instruction in Secondary Education: Eng/Spch/Theatre (3)  
EDCI 467—Teaching Writing (3)  
EDCI 466—Literature for Adolescents (3)  
EDCI 447—Field Experience in English, Speech, Theatre Teaching (1)  
EDCI 448—Student Teaching in Secondary Schools: Theatre/English (12)  
EDCI 440—Student Teaching Seminar in Secondary Education: English, Speech, Theatre (1)

## Social Studies Education (Grades 7-12)

Students in the Social Studies Education program may select an area of concentration in history, geography, or government and politics. Each concentration follows the general requirements of their respective majors in addition to the pre-professional/subject area supporting course work required for certification. Students may elect to complete the program for certification in Social Studies by choosing one of three options for completing the program.

**Option I: HISTORY:** This option, which requires completion of the foreign language requirement, is primarily for those students earning their initial degree. Requires 68 semester hours of which 39 credit hours must be in history.

**NOTE:** The history major requires completion of UNIV 101 and a foreign language requirement through the intermediate level. See ARHU advisor for details.

### Pre-Professional/Subject Area Courses

**Introductory Courses:**  
HIST 156 (3) (CORE: SH)  
HIST 157 (3) (CORE: SH)

100-200 level HIST (non-US, >1500) (3) (See advisor for approved courses)  
HIST 209 or HIST 220 (3)  
HIST 309 (3)

### History Electives: (24 credits)

18 credits at the junior/senior level  
15 credits must be in a concentration  
1 course must be non-Western

In addition to the required credit hours in history, the social studies education program requires 29 credit hours of course work in geography and the social sciences as outlined below.

GEOG 100 (3) (CORE: SB)  
GEOG 201/211 (3/1) (CORE: PL)  
SOCY or ANTH (3)  
ECON 200 (4)  
ECON Elective (3)  
GVPT 100, 260, or 280 (3) (CORE: SB)  
GVPT 170 (3) (CORE: SB)

### Geography/Social Science Electives (6) (junior-senior level)

One course in Ethnic Minority Studies (U.S. orientation); can be one of the above courses in history, geography, or social sciences (3).

**Option II: GEOGRAPHY:** This option is primarily for those students earning their initial degree. Requires 60 credit hours of Pre-professional/Subject Area course work. Thirty-five credit hours must be in geography. GEOG 201, 211, 202, 212 are required. Nine credit hours of 300 level Gateway courses must be taken in physical geography, human geography, and geographic techniques. The remaining 18 credit hours must include a quantitative methods course and 15 credit hours of upper level systematic geography courses.

### Pre-Professional/Subject Area Courses

**Primary Courses:**  
GEOG 201/211 (3) (1)  
GEOG 202/212 (3) (1)

**Gateway Courses:**

300 level physical course (3)  
 300 level human course (3)  
 300 level technique course (3)

Upper Level Geography Electives (15)  
 Quantitative Methods (3)

In addition to the required credit hours in geography, the social studies education program requires 25 credit hours of course work in history and the social sciences as outlined below.

SOCY or ANTH (3)  
 ECON 200/CORE (4)  
 ECON Elective (3)  
 GVPT 100, 260, OR 280 (3)  
 GVPT 170/CORE (3)  
 HIST 156 or 157/CORE (3)  
 HIST (non-Western 100/200 level) (3)  
 History/Social Science Elective – Junior or Senior level (3)

One course in Ethnic Minority Studies (U.S. orientation); can be one of the above courses in social sciences or history (3).

**Option III: GOVERNMENT AND POLITICS:** This option is primarily for those students earning their initial degree. Requires a minimum of 65 credit hours of preprofessional/subject area course work. Thirty-six hours must be in GVPT. GVPT 100, 170, and 241 are required. At least eighteen of the thirty-six credit hours must be upper-level courses.

All GVPT majors must also complete an approved skills option (a foreign language or three quantitative courses from a select list – see GVPT advising office.)

In addition, the GVPT program is a Limited Enrollment Program (LEP). See GVPT advisor for specific admission requirements.

**Pre-Professional/Subject Area Courses****Introductory Courses:**

GVPT 100/CORE (3)  
 GVPT 170/CORE (3)  
 GVPT 241 (3)  
 GVPT Electives (9)  
 GVPT Upper Level Courses (18)  
 Social Science Quantitative Courses or Foreign Language (see GVPT advisor)

In addition to the required credit hours in GVPT, the social studies education program requires 26 credit hours of course work in history and the social sciences as outlined below.

HIST 156 or 157/CORE (3)  
 HIST (non-Western 100/200 level) (3)  
 SOCY or ANTH (3)  
 ECON 200/CORE (4)  
 ECON Elective (3)  
 Upper Level GEOG/HIST (3)  
 GEOG 201 AND 211/CORE (3/1)  
 GEOG 100/CORE (3)

One course in Ethnic Minority Studies (U.S. orientation); can be one of the above courses in social sciences or history (3).

All options must complete the following Education course work:

**Pre-Professional/Education Courses**

EDPL 301 – Foundations of Education (3)  
 EDHD 413 – Adolescent Development (3)  
 EDHD 426 – Cognition & Motivation in Reading: Reading in the Content Areas I (3)  
 EDCI463 – Reading in the Secondary School (3)

**Professional Education Courses**

EDCI 426 – Materials & Resources in Social Studies (3)  
 EDCI 320 – Curriculum and Instruction in Secondary Education – Social Studies (3) (Fall only)  
 EDCI 428 – Field Experience in Secondary Social Studies Teaching (1) co-requirement EDCI 320 (Fall only)  
 EDCI 421 – Student Teaching in Secondary Schools: Social Studies (12)  
 EDCI 420 – Student Teaching Seminar in Secondary Education: Social Studies (3)

Course Code: EDCI

**DANCE (DANC)****College of Arts and Humanities**

Clarice Smith Performing Arts Center, (301) 405-3180

Professor and Chair: Wiltz  
 Professors: Rosen, A. Warren  
 Associate Professor: Bradley  
 Assistant Professor: Yatkin  
 Instructor: Mayes  
 Emeriti: Madden, L. Warren  
 Lecturers: Druker, Jackson  
 Accompanists: Freivogel, Johnson

**The Major**

The undergraduate curriculum, which leads toward a B.A. degree in Dance, is designed to facilitate the acquisition of new movement skills, enhance creativity, and develop scholarly insights in the field. Comprehensive studio and theory courses provide a foundation for a range of careers in dance. Students may choose to study a particular aspect of dance in depth, such as performance, choreography, or production; or they may choose to merge their interest in dance with an interest in another field of study. Graduates of the program pursue graduate work in dance as well as careers as professional dancers and choreographers, university and secondary school teachers, dance managers, and dance critics. They also work in the fields of dance medicine and therapy.

The dance faculty is composed of a number of distinguished teachers, choreographers, and performers, each one a specialist in his or her own field. Visiting artists throughout the year make additional contributions to the program. There are performance and choreographic opportunities for all dance students, ranging from informal workshops to fully mounted concerts both on and off campus.

**Requirements for the Major**

Students must complete 57 semester hours of dance credits. Of these, 18 hours of modern technique at the Dance 248 and above level and four hours of ballet technique at the Dance 228 and above level are required. The remaining 35 credits must be distributed as follows:

DANC 102—Rhythmic Training .....	2
DANC 109—Improvisation.....	2
DANC 200—Introduction to Dance .....	3
DANC 210—Dance Production .....	3
DANC 208, 308, 388—Choreography I, II, III .....	9
DANC 305—Principles of Teaching .....	3
DANC 370—Kinesiology for Dancers .....	4
DANC 466—Laban Movement Analysis .....	3
DANC 483—Dance History II.....	3
DANC 485—Seminar in Dance .....	3

A grade of C or higher must be attained in all dance courses.

New, re-entering, and transfer students are expected to contact the department following admission to the university for instructions regarding advising and registration procedures. Although entrance auditions are not required, some previous dance experience is highly desirable.

Departmental advising is mandatory each semester.

Course Code: DANC

**DECISION AND INFORMATION SCIENCES**

For information, consult the Robert H. Smith School of Business entry in chapter 6.

**DIETETICS**

For more information, consult Nutrition and Food Science later in this chapter.

## 108 Economics

### ECONOMICS (ECON)

#### College of Behavioral and Social Sciences

Undergraduate Studies: 3105 Tydings, (301) 405-3505  
Undergraduate Adviser: 3127A Tydings, (301) 405-3503  
3127C Tydings, (301) 405-3513

Professors: Almon, Ausubel, Betancourt, Calvo, Cramton, Cropper, Drazen, Evans, Haltiwanger, Hulten, Kelejian, Mendoza, Montgomery, Murrell, Oates, Panagariya, Prucha, Reinhart, Rust, Schelling, Schwab, Straszheim, Wallis

Associate Professors: Coughlin, Hellterstein, Kranton, Lyon, Minehart, Sakellaris, Sanders, Shea, Smith, Vincent

Assistant Professors: Binder, Broner, Chao, Gelbach, Jin, Limão, Pries, Rodriguez

Professor Emeritus: Adams, Bennett, Bergmann, Brechling, Clague, Cumberland, Dardis, Dorsey, Harris, McGuire, Meyer, O'Connell, Polakoff, Wonnacott

#### The Major

Economics is the study of the production, pricing, and distribution of goods and services within societies. Economists study such problems as inflation, unemployment, technical change, poverty, environmental quality, and foreign trade. Economists also apply economics to such diverse areas as crime, health care and the elderly, discrimination, urban development, and developing nation problems.

Two characteristics of modern economics receive special attention in the department's program. Government policies have profound effects on how our economic system performs. Government expenditures, regulations, and taxation either directly or indirectly affect both households and firms. Second, there is a growing interdependency among economies throughout the world. Extensive worldwide markets exist in which goods and services are traded, and capital and investments move across national boundaries. Economic events in one nation are often quickly transmitted to other nations.

Economists study these phenomena through the development of systematic principles and analytic models which describe how economic agents behave and interact. These models are the subject of empirical testing, often using computers and extensive data sets.

The interests of the faculty, as reflected in the course offerings, are both theoretical and applied. As a large, diverse department, the economics department offers courses in all of the major fields of economic study. The department's program stresses the application of economic theory and econometrics to current problems in a large number of fields. Many courses in the department's program analyze the role of the government and public policies on the economy.

The program is designed to serve both majors and non-majors. The department offers a wide variety of upper-level courses on particular economic issues which can be taken after one or two semesters of basic principles. These courses can be especially useful for those planning careers in law, business, or the public sector. The program for majors is designed to serve those who will seek employment immediately after college as well as those who will pursue graduate study.

Economics majors have a wide variety of career options in both the private and public sectors. These include careers in state and local government, federal and international agencies, business, finance and banking, journalism, teaching, politics and law. Many economics majors pursue graduate work in economics or another social science, law, business or public administration (public policy, health, urban and regional planning, education, and industrial relations).

#### Requirements for Major

In addition to the university's general education (CORE) requirements, the requirements for the Economics major are as follows:

##### (1) Economics (and Mathematics) Courses (36 hours)

Economics majors must earn 35 credit hours in Economics, and 3 credit hours in Calculus (MATH 220 or 140), with a grade of C or better in each course. All majors must complete 14 hours of fundamental requirements. The fundamental requirements include ECON 200, ECON 201, ECON 305 and ECON 306.

Students must also complete 21 hours in upper level Economics courses:

- three hours in statistics; ECON 321 or STAT 400 (check with adviser). Majors who declared after January 1, 1998, must take ECON 321 or STAT 400.
- three hours in economic history or comparative systems; ECON 310, ECON 311, ECON 315, ECON 380, or ECON 410;
- nine hours in courses with at least one semester of intermediate theory (ECON 305 or 306) or economic statistics (ECON 321) as a prerequisite. As of September 1, 1999, all 400 level Economics classes meet this requirement. ECON 430, 449, 450, 451, 465, and 490 taken before that date do not fulfill the requirement;
- six other hours in any upper-division economics course except ECON 386.

##### (2) Additional Supporting Courses (15 hours)

Students must earn 15 hours of credit in upper-division courses in addition to the 38 hours of Economics (and Mathematics) courses listed above and the university's CORE requirements. Upper division courses include all courses with a 300 number and above except the Junior English writing class. Additional mathematics courses beyond the required mathematics course (MATH 220 or 140), and computer programming courses at the 200-level and above may be counted as fulfilling the Additional Support Course Requirement. Additional economics courses may be included among the 15 hours of supporting courses. All supporting courses must be approved by an Economics Department Adviser.

All courses meeting this Additional Support Course requirement must be completed with a grade of C or better and may not be taken pass-fail except ECON 386, which can only be taken pass-fail.

#### Study Sequences and Plans of Study

Economics is an analytic discipline, building on a core of principles, analytic models, and statistical techniques. Students must begin with a foundation in mathematics and economic principles (ECON 200 and ECON 201). A more advanced, analytic treatment of economics is presented in intermediate theory (ECON 305 and ECON 306), which is a necessary background for in-depth study by economics majors.

The department urges that the student take ECON 200 and 201 and MATH 140 or 220 as soon as possible. Honors versions of ECON 200 and 201 are offered for students seeking a more rigorous analysis of principles, departmental honors candidates, and those intending to attend graduate school. Admission is granted by the department's Office of Undergraduate Advising or the University Honors Program.

Courses in applied areas at the 300-level may be taken at any point after principles. However, majors will benefit by completing ECON 305, ECON 306, and ECON 321 or its equivalent immediately upon completion of principles. While most students take ECON 305 and 306 in sequence, they may be taken concurrently. Courses at the 400-level are generally more demanding, particularly those courses with intermediate theory as a prerequisite.

Empirical research and the use of computers are becoming increasingly important in economics. All students are well advised to include as many statistics, econometrics, and computer programming courses in their curriculum as possible.

Those students planning to pursue graduate study in economics must begin to prepare themselves analytically for graduate work by focusing on theory, statistics, and mathematics in their undergraduate curriculum. These students should consider the advanced theory courses and the econometrics sequence. Mastery of the calculus and linear algebra is essential for success in many of the top graduate schools. Students should consider MATH 140, MATH 141, MATH 240 (or MATH 400), MATH 241 and MATH 246 as very useful preparation.

#### Advising

The department has academic advisers providing advising on a walk-in basis in the Office of Undergraduate Advising, 3127A & C Tydings Hall.

#### Honors

The Economics Honors Program provides economics majors with the opportunity for advanced study in a seminar format, with faculty supervision of seminar papers and an honors thesis. The Honors Program is designed for students intending to attend graduate school or those seeking an in-depth study of economic theory and its application to economic problems.

The Honors Program is a 12-hour sequence, culminating in the completion of a senior thesis. Students must complete ECON 396 (Honors Workshop) and ECON 397 (Honors Thesis) in their senior year, as well as two of the following five courses: ECON 407, 414, 417, 422, 423, 425. Students must complete these 12 hours with a GPA of 3.5. ECON 396 is offered only in the fall term.

To be eligible for admission, a student must have completed 15 hours of economics with a GPA of 3.25. Interested students should meet with the Director of Undergraduate Studies at the earliest possible date to review their curriculum plans and to apply for admission to the program.

## Awards

The Dudley and Louisa Dillard Prize, currently \$1,000, is awarded to the outstanding Economics junior and senior with a broad liberal arts program.

The Sujon Guha Prize, currently \$500, is awarded to the best Honors Thesis in Economics.

The Martin Moskowitz Awards provides scholarships to students based on academic excellence, financial need, and a demonstrated commitment to and philosophy of public service.

## Student Organizations

Omicron Delta Epsilon is the economics honorary society. Please see the Undergraduate Economics Secretary in 3015 Tydings for membership information.

The Economics Association of Maryland is an undergraduate club that meets regularly to discuss graduate study in economics and other fields, employment opportunities, and recent economic trends. Please see the Undergraduate Advisor in 3127B Tydings for more information.

Course Code: ECON

## EDUCATION POLICY AND LEADERSHIP (EDPL)

### College of Education

2110 Benjamin Building, (301) 405-3574  
[www.education.umd.edu/EDPL](http://www.education.umd.edu/EDPL)

Professor and Interim Chair: Weible  
 Professors: Finkelstein, Hultgren, Klees, Malen, Selden  
 Associate Professors: Herschbach, Lin, Mawhinney, Milem, Rice  
 Assistant Professors: Cossentino, Croninger, Fries-Britt, Honig, Kezar, Perna, Spreen, Williams  
 Emeriti: Berdahl†, Berman, Birnbaum, Carbone, Clague, Dudley, Hawley, McLoone, Newell, Schmidlein, Splaine, Stephens  
 †Distinguished Scholar Teacher

The Department of Education Policy and Leadership offers programs at the master's and doctoral degree levels to prepare educational leaders in a wide variety of leadership roles including school administrators, policy analysts, program directors, program planners, researchers, teachers, and professionals in international education development. Students choose a specialization from among the following areas: Curriculum Theory and Development, Education Policy and Social Foundations, Organizational Leadership and Policy Studies, Higher Education and International Education Policy.

While the department does not have an undergraduate major, it does offer a number of courses which are open to undergraduates and are suggested for students interested in studying the role of education in society or considering graduate work in education policy and leadership. Particular courses of interest include Foundations of Education and Education in Contemporary American Society.

Course Code: EDPL

## ELECTRICAL ENGINEERING (ENEE)

### A. James Clark School of Engineering

#### Department of Electrical and Computer Engineering

2429 A.V. Williams Building, (301) 405-3685

E-mail: [eceadvise@deans.umd.edu](mailto:eceadvise@deans.umd.edu)

[www.ece.umd.edu](http://www.ece.umd.edu)

Chair: Marcus

Associate Chairs: Blankenship (External Relations), Rhee (Facilities and Services), Orloff (Undergraduate Studies), Tit (Graduate Studies)

Professors: Abed, Antonsen, Baras, Barbe, Blankenship, Chellappa†, Dagenais, Davis†, DeClaris, Destler†, Ephremides, Farvardin, Gligor, Goldhar, Goldsman, Granastein, Ho, Jájá, Krishnaprasad, Lawson, Lee, Levine, Liu, Makowski, Marcus, Mayergoyz†, Melngailis, Milchberg, Nakajima, Narayan, Newcomb, Orloff, Oruc, Ott††, Peckerar (part-time), Rabin, Rhee, Shamma, Shayman, Tits, Vishkin, Yang, Zaki

Associate Professors: Bhattacharyya, Espy-Wilson, Etienne-Cummings, Franklin, Gomez, Iliadis, O'Shea, Papamarcou, Silio, Tretter

Assistant Professors: Abshire, Barua, Gansman, Ghodssi, Horiuchi, Jacob, La, Murphy, Papadopoulos, Qu, Simon, Srivastava, Ulukus, Wu, Yeung  
 Emeriti: Davisson, Emad, Harger, Ligomenides, Lin, Pugsley, Reiser, Striffler, Taylor, Wagner

†Distinguished Scholar Teacher

††Distinguished University Professor

## The Major

The Electrical Engineering major is intended to prepare students to function as effective citizens and engineers in an increasingly technological world as well as in science and engineering subjects. Depth as well as breadth is required in the humanities and social sciences to understand the economic, ecologic, and human factors involved in reaching the best solutions to today's problems.

The basic foundation in mathematical, physical, and engineering sciences is established in the first two years of the curriculum. A core of required Electrical Engineering courses is followed by a flexible structure of electives that allows either breadth or specialization. Appropriate choices of electives can prepare an Electrical Engineering major for a career as a practicing engineer and/or for graduate study.

Areas stressed in the major include communication systems, computer systems, control systems, engineering electromagnetics, microelectronics, and power systems. Within these areas are courses in such topics as solid state electronics, integrated circuits, lasers, communications engineering, computer design, power engineering, digital signal processing, antenna design, and many others. Project courses allow undergraduates to undertake independent study under the guidance of a faculty member in an area of mutual interest.

The following are the objectives of the Electrical Engineering degree program:

1. Provide all students with basic training in electrical engineering, as well as opportunities for specialized training in several technical areas;
2. Prepare students for study in the nation's top graduate schools and/or employment in a variety of positions in government and industry;
3. Through such tools as honors courses, research programs and financial aid packages, facilitate the recruitment and retention of a diverse student body, with particular emphasis on historically underrepresented groups;
4. Provide students with an understanding of the social context of the electrical engineering profession;
5. Provide students with an understanding of the ethical responsibilities of practicing engineers, as stipulated in the IEEE Code of Ethics;
6. Provide students with an ability to communicate and defend their ideas effectively;
7. Provide students with the skills necessary for successful participation in interdisciplinary projects;
8. Provide students with an ability to identify engineering problems and propose appropriate solutions, including the step-by-step design of a system, component or process;
9. Provide students with a strong foundation in mathematics, sciences and engineering, and the ability to apply said knowledge to solving engineering problems;
10. Provide students with an ability to design and conduct experiments, interpret empirical observations and analyze data;

2. Additional Capstone Design courses can be used as substitutes for
  - the required Advanced Theory and Applications course; and/or
  - the required Advanced Laboratory course, provided one of the following is completed: ENEE 408A, 408B, 408C, or 408F.
3. Completion of ENEE 408A and ENEE 459A satisfies both the Capstone Design and Advanced Laboratory requirements.
4. There is no longer a requirement that students complete a total of seven design credits, hence there is no need to consult the list of design credits for each course.
5. There are no changes to the requirements for non-EE technical electives (i.e., 12 credits from the approved course list, including at least one three-credit math course).
6. If you have any questions on how these requirements affect your current selection of senior EE electives, please contact an advisor.

### Admission

Admission requirements are the same as those of other departments. (See A. James Clark School of Engineering section on Entrance Requirements.)

### Advising

In addition to the associate chair and the Director of Undergraduate Affairs, faculty in Electrical and Computer Engineering function as undergraduate advisers. Departmental approval is required for registration in all courses in the major. The department's Undergraduate Office (2429 A.V. Williams Building, (301) 405-3685) is the contact point for undergraduate advising questions.

### Financial Assistance

Several corporate scholarships are administered through the department. Information and scholarship applications are available from either the Electrical Engineering Undergraduate Office, 2429 A.V. Williams Building, 405-3685, or the A. James Clark School of Engineering Student Affairs Office, 1131 Engineering Classroom Building, 405-3860.

### Honors and Awards

The Electrical and Computer Engineering department annually gives a variety of academic performance and service awards. Information on criteria and eligibility is available from the department's Undergraduate Office. Majors in Electrical Engineering participate in the Engineering Honors Program. See the A. James Clark School of Engineering entry in this catalog for further information.

### Department Honors Program

The Electrical and Computer Engineering Honors Program is intended to provide a more challenging and rewarding undergraduate experience for the best students pursuing the baccalaureate in Electrical Computer Engineering. Honors sections are offered in almost all technical courses in the freshmen, sophomore, and junior years, and a honors project is taken during the senior year. Students completing the program with at least a 3.0 average on a 4.0 scale will have their participation in the program indicated on their B.S. diploma.

### Student Organizations

There is an active Student Chapter of the Institute of Electrical and Electronics Engineers (IEEE). Information and membership applications are available in the Electrical and Computer Engineering undergraduate lounge, 0107 Engineering Classroom Building. Equally active is the chapter of Eta Kappa Nu, the nationwide Electrical Engineering honorary society.

## ENGINEERING, BACHELOR OF SCIENCE, DEGREE IN

### A. James Clark School of Engineering

1124 Glenn L. Martin Hall (formerly Engineering Classroom Building),  
(301) 405-3855

### General Regulations for the B.S. Engineering Degree

All undergraduates in engineering will typically select their major field sponsoring department by the end of their second year regardless of whether they plan to proceed to a designated or an undesignated degree. A student wishing to elect the B.S. Engineering degree program may do so at any time following the completion of the sophomore year, or a minimum of 50 earned credits towards any engineering degree, and at least one semester prior to the time the student expects to receive the baccalaureate. As soon as the student elects to seek a B.S. Engineering degree, the student's curriculum planning, guidance, and counseling will be the responsibility of the "B.S. Engineering Degree Program Adviser" in the primary field department. The student must file an "Application for Admission to Candidacy for the Degree of Bachelor of Science in Engineering" with the student affairs office of the A. James Clark School of Engineering. The candidacy form must be approved by the chair of the primary field department, the primary engineering, and the secondary field advisers and the college faculty committee on "B.S. Engineering Degree Programs." This committee has the responsibility for implementing all approved policies pertaining to this program and reviewing and acting on the candidacy forms filed by the student.

Specific university and school academic regulations apply to this B.S. Engineering degree program in the same manner as they apply to the conventional designated degree programs. For example, the academic regulations of the university apply and the school requirement of an overall average of an overall average of 2.0 GPA or better and a grade of C or better in all engineering courses. For the purpose of implementation of such academic rules, the credits in the primary engineering field and the credits in the secondary field are considered to count as the "major" for such academic purposes.

### Options of the "B.S. Engineering" Program

The "B.S. Engineering" program is designed to serve three primary functions: (1) to prepare those students who wish to use the breadth and depth of their engineering education as preparation for entry into post-baccalaureate study in such fields as medicine, law, or business administration; (2) to provide the basic professional training for those students who wish to continue their engineering studies on the graduate level in one of the new interdisciplinary fields of engineering such as environmental engineering, bio-medical engineering, systems engineering, and many others; and finally (3) to educate those students who do not plan a normal professional career in a designated engineering field but wish to use a broad engineering education so as to be better able to serve in one or more of the many auxiliary or management positions of engineering related industries. The program is designed to give the maximum flexibility for tailoring a program to the specific future career plans of the student. To accomplish these objectives, the program has two optional paths: an engineering option and an applied science option.

**The engineering option**, which is ABET-accredited, should be particularly attractive to those students contemplating graduate study or professional employment in the interdisciplinary engineering fields, such as environmental engineering, bio-engineering, bio-medical, systems and control engineering, and manufacturing engineering, or for preparatory entry into a variety of newer or interdisciplinary areas of graduate study. For example, a student contemplating graduate work in environmental engineering might combine chemical and civil engineering for his or her program; a student interested in systems and control engineering graduate work might combine electrical engineering with aerospace, chemical, or mechanical engineering.

**The applied science option**, which is not ABET-accredited, should be particularly attractive to those students who do not plan to pursue a professional engineering career but wish to use the rational and developmental abilities fostered by an engineering education as a means of furthering career objectives. Graduates of the applied science option may aspire to graduate work and an ultimate career in a field of science, law, medicine, business, or a variety of other attractive opportunities which build on a combination of engineering and a field of science. Entrance requirements for law and medical schools can be met readily under the

format of this program. In the applied science program, any field in the university in which the student may earn a B.S. degree is an acceptable secondary science field, thus affording the student a maximum flexibility of choice for personal career planning.

### Minimum Requirements

Listed below are the minimum requirements for the B.S. Engineering degree with either an engineering option or an applied science option. Students completing the B.S. Engineering degree are required to complete the freshman and sophomore requirements in the chosen primary engineering field and the general education requirements as outlined by the university and the Clark School of Engineering. The student, thus, does not make a decision whether to take the designated or the undesignated degree in an engineering field until the beginning of the junior year. In fact, the student can probably delay the decision until the spring term of the junior year with little or no sacrifice, thus affording ample time for decision-making. Either program may be taken on the regular four-year format or under the Maryland Plan for Cooperative Engineering Education.

### Junior-Senior Year Requirements

#### Engineering Option

Mathematics/Physical Science Requirements <sup>4</sup> .....	3
Engineering Sciences <sup>2,4</sup> .....	3
Primary Field <sup>1,7</sup> .....	24
Secondary Field <sup>1,7</sup> .....	12
Major Field or related electives <sup>4</sup> .....	3
Approved electives <sup>3,4</sup> .....	6
<b>Total credits</b> .....	<b>51</b>

#### Applied Science Option

Mathematics/Physical Science Requirements <sup>4</sup> .....	3
Engineering Sciences <sup>2,4</sup> .....	3
Primary Field <sup>1</sup> .....	18
Secondary Field <sup>1</sup> .....	12
Major Field or related electives <sup>4</sup> .....	3
Approved electives <sup>4,6</sup> .....	9
Senior research project <sup>5</sup> .....	3
<b>Total credits</b> .....	<b>51</b>

Engineering fields of concentration available under the B.S. Engineering program as primary field within either the engineering option or the applied science option are: aerospace engineering, biological resources engineering, chemical engineering, civil engineering, computer engineering, electrical engineering, fire protection engineering, materials engineering, mechanical engineering, and nuclear engineering. There is also an environmental engineering option. All engineering fields of concentration may be used as a secondary field within the engineering option.

<sup>1</sup>All courses used to fulfill the primary and secondary fields of concentration must be at the 300- and 400-level.

<sup>2</sup>Engineering Science courses are courses offered by the Clark School of Engineering which have a prefix beginning with EN (e.g., ENES, ENME, ENEE, etc.). These elective courses may be in a student's primary or secondary field of concentration.

<sup>3</sup>Approved electives must be technical (mathematics, physical sciences, or engineering sciences) but may not be in the primary or secondary fields of concentration.

<sup>4</sup>At least 50 percent of the elective courses (mathematics, physical sciences, engineering sciences, approved electives) must be at the 300- or 400-level.

<sup>5</sup>Students are required to complete 15 credits of approved electives which include a senior-level project or research assignment relating the engineering and science fields of concentration, unless specifically excused.

<sup>6</sup>In the applied science option, the approved electives should be selected to strengthen the student's program consistent with career objectives. Courses in the primary or secondary fields of concentration may be used to satisfy the approved electives requirement.

<sup>7</sup>For the engineering option, the program must contain the proper design component, as specified by ABET requirements. It is the responsibility of students and their advisers to ensure that the requirements are satisfied by the appropriate selection of courses in the primary and secondary fields of concentration.

## 112 English Language and Literature

### ENGLISH LANGUAGE AND LITERATURE (ENGL)

#### College of Arts and Humanities

3101 Susquehanna Hall (SQH), (301) 405-3809  
[www.english.umd.edu](http://www.english.umd.edu)

Undergraduate Advisers: 2115 Susquehanna Hall, (301) 405-3825  
Freshman English Office: 2101 Susquehanna Hall, (301) 405-3771  
Professional Writing Program: 3119 Susquehanna Hall, (301) 405-3762

Professor and Chair: Caramello

Professors: Auchard, Auerbach, Barry, Bryer, Caramello, Caretta, Cartwright, Coletti, Collier, Collins, Cross, Donawerth\*, Fahnestock, Flieger, Fraistat, Grossman, D. Hamilton, Kauffman\*, Kornblatt, Leinwand, Leonardi, Levine, Mack, Pearson, C. Peterson, W. Peterson, Plumly††, Smith, Turner††, Washington, Wyatt\*

Associate Professors: Cate, Cohen, Coleman, G. Hamilton, Kleine, Lindemann, Logan, Loizeaux, Marcuse, Moser, Norman, Ray, Richardson, Rosenthal, Sherman, Van Egmond, Wang

Assistant Professors: Arnold, Bauer, Chuh, Israel, Jarrett, Jellen, Kirschenbaum, Mallios, Weiner

Instructor: Terchek

Lecturers: Miller, Ryan

Professors Emeriti: Beauchamp, Coogan, Freedman, Fry, Hammond, Howard, Isaacs, Jellema, Lawson, Lutwack, Miller, Myers, Panichas, Salamanca, Trousdale, Vitzhum, Whittmore, Winton

††Distinguished University Professor

\*Distinguished Scholar Teacher

#### Advising

Departmental advising is mandatory for all majors each semester.

#### The Major

The English major has been designed by the English Department faculty with three purposes in mind: 1) to give students a sense of the history and variety of literature written in English, 2) to introduce students to the debates about literature and language that shape our intellectual lives, and 3) to use the critical study of literature and language to help students think carefully and express themselves well. An English major provides professional preparation for a career in the law, government, journalism, business, communication, teaching, or any field that requires strong analytical and communication skills.

#### Requirements for Major

Requirements for the English major include the College of Arts and Humanities requirement of a minimum of 45 upper-level credits and the foreign language requirement. The English major requires 39 credits in English beyond the two required University writing courses.

The English major has three parts. The CORE Requirements assure that students read widely and become aware of the questions an inquiring reader might ask of a text. The specialization offers students the opportunity to read more deeply in an area of special interest. The Electives allow students to explore other areas of interest.

#### CORE Requirements (18 credits)

All to be taken at the 300- or 400-level

1. English 301: Critical Methods in the Study of Literature. For all majors, a pre- or co-requisite for other 300- or 400-level English courses. We recommend it be taken during the sophomore year.
2. A course in British Literature emphasizing literature written before 1670
3. A second course in British Literature emphasizing literature before 1900
4. A course in American Literature
5. A course in a) African American literature, b) literature of peoples of color, c) literature by women, or d) gay, lesbian and bisexual literature
6. A senior seminar, to be taken after 86 credits and after the completion of at least two upper-level English courses

#### Specializations (12 credits)

(Four courses beyond the 6 CORE Requirements above)

Students choose one of the following:

1. British and American Literature
2. American Literature

3. British, Postcolonial, and International Anglophone Literature
4. Language, Writing, and Rhetoric
5. Creative Writing
6. Literature of the African Diaspora
7. Mythology and Folklore
8. Literature by Women
9. Film and Visual Studies
10. Student Specified Concentration

**Electives** (9 credits): Chosen in consultation with an adviser.

Only two 200-level courses may be counted toward the major. No course with a grade less than C may be used to satisfy the major. For further details on requirements, contact the English Department's Office of Undergraduate Studies (2115 SQH, 301-405-3825).

#### English and English Education Double Major

In conjunction with the College of Education, the English Department offers a special 125-credit program for students wishing to double major in English and English Education, allowing them to earn a certificate to teach English at the secondary level. For a list of requirements, contact the Office of Undergraduate Studies (2115 SQH, 301-405-3825).

#### Honors

The English Department offers an extensive Honors Program, primarily for majors but open to others with the approval of the departmental Honors Committee. Interested students should ask for detailed information from an English Department adviser as early as possible in their college careers.

#### The Writing Center

The Writing Center, 0125 Taliaferro, (301) 405-3785, provides free tutorial assistance to students with writing assignments. English 101 students generally work with student tutors. English 391/2/3/4/5 students usually work with tutors who are retired professionals. Appointments are recommended, but walk-ins are welcome based on availability of tutors. Students, faculty, and staff with questions about punctuation, sentence structure, word choice, or documentation can call the Writing Center's Grammar Hotline at (301) 405-3787.

#### English Department Citations for Both English Majors and Non-English Majors

##### Citation in Renaissance Studies

15 credit hours. At least one course each in History, Literature and Visual and Performing Arts from approved list of courses; at least four courses at the 300 or 400 level. Students who fulfill Citation requirements will receive a Citation on the official transcript. Please contact the Director of Undergraduate Studies for more information.

##### English Department Citations for Non-English Majors

##### Citation in British and American Literature

15 credit hours

##### Citation in Rhetoric

Contact English Undergraduate Studies or Communication Undergraduate Studies.

*Four courses in:* British and American literature, two in British and two in American, one course of which must be before 1900

*Additional requirements:* One additional course in the Department of English of the student's choosing.

At least 9 of the 15 credit hours must be at the 300 or 400 level (but no overlap with freshman or junior/professional writing requirements).

Courses used for one Department of English citation may not be used to satisfy requirements for other citations in the Department of English or elsewhere.

Contact English Undergraduate Studies, 2115 Susquehanna Hall, (301) 405-3825.

**Citation in American Literature**

15 credit hours

*Four courses in:* American literature, one of which must be in literature before 1900.

*Additional requirements:* One additional course in the Department of English of the student's choosing.

At least 9 of the 15 credit hours must be at the 300 or 400 level (but no overlap with freshman or junior/professional writing requirements).

Courses used for one Department of English citation may not be used to satisfy requirements for other citations in the Department of English or elsewhere.

*Advisor:* English Undergraduate Studies, 2115 Susquehanna Hall, (301) 405-3825.

**Citation in British, Postcolonial, and International Anglophone Literature**

15 credit hours

*Four courses in:* British, Postcolonial, and International Anglophone Literature, including at least one course in literature before 1830.

*Additional requirements:* One additional course in the Department of English of the student's choosing.

At least 9 of the 15 credit hours must be at the 300 or 400 level (but no overlap with freshman or junior/professional writing requirements).

Courses used for one Department of English citation may not be used to satisfy requirements for other citations in the Department of English or elsewhere.

Contact English Undergraduate Studies, 2115 Susquehanna Hall, (301) 405-3825.

**Literature of the African Diaspora**

15 credit hours

*Four courses in:* Literature of the African Diaspora

*Additional requirements:* One additional course in the Department of English of the student's choosing.

At least 9 of the 15 credit hours must be at the 300 or 400 level (but no overlap with freshman or junior/professional writing requirements).

Courses in the Afro-American Studies Program that are cross-listed in English may be used to fill requirements for this citation.

Courses used for one Department of English citation may not be used to satisfy requirements for other citations in the Department of English or elsewhere.

Contact English Undergraduate Studies, 2115 Susquehanna Hall, (301) 405-3825.

**Literature by Women**

15 credit hours

*Four courses, including:* 1 Theory, 3 Literature

*Additional requirements:* One additional course in the Department of English of the student's choosing

At least 9 of the 15 credit hours must be at the 300 or 400 level (but no overlap with freshman or junior/professional writing requirements).

Courses in the Department of Women's Studies that are cross-listed in English may be used to fill requirements for this citation.

Courses used for one Department of English citation may not be used to satisfy requirements for other citations in the Department of English or elsewhere.

Contact English Undergraduate Studies, 2115 Susquehanna Hall, (301) 405-3825.

Course Code: ENGL

**ENTOMOLOGY (ENTM)****College of Life Sciences**

4112 Plant Sciences Bldg., (301) 405-3911  
[www.entm.umd.edu](http://www.entm.umd.edu)

Professor and Chair: Mitter

Professors: Barbosa, Bottrell, Denno, Dively, Hellman, Ma, Palmer, Raupp, St. Leger, Thorne, Via

Associate Professors: Armstrong, Brown, Lamp, Nelson, Shultz

Assistant Professors: Hawthorne, Shrewsbury

Instructor: Kent

Director of Undergraduate Studies: Kent

Professors Emeriti: Bickley, Davidson, Harrison, Jones, Linduska, Menzer, Messersmith, Steinhauer, Wood

**The Major**

Entomology is an Advanced Program Specialization in the area of Biological Sciences. This specialization area prepares students for careers or graduate work in any of the specialized areas of entomology. Professional entomologists are engaged in fundamental and applied research in university, government, and private laboratories; regulatory and control activities with Federal and State agencies; commercial pest management services; sales and development programs with chemical companies and other commercial organizations; consulting, extension work, and teaching.

Advising is mandatory. Students should work closely with their advisers in choosing electives.

**Requirements for Specialization**

See Biological Sciences elsewhere in this chapter and Entomology adviser for specific program requirements.

Course Code: ENTM

**ENVIRONMENTAL SCIENCE AND POLICY PROGRAM (ENSP)**

0102 Symons Hall, (301) 405-8571

**E-mail:** [bj5@umail.umd.edu](mailto:bj5@umail.umd.edu) or [jbrown@deans.umd.edu](mailto:jbrown@deans.umd.edu)

[www.agnr.umd.edu/users/ensp](http://www.agnr.umd.edu/users/ensp)

Director: James

Associate Director: Whittemore

Environmental Science and Policy is a broadly multidisciplinary major, drawing courses and faculty from 20 departments and four Colleges (Agriculture and Natural Resources; Behavioral and Social Sciences; Computer, Mathematical, and Physical Sciences; and Life Sciences). There are 13 areas of concentration within the major, most of which are also cross-disciplinary. Students will choose a particular area of concentration and will be assigned an adviser from among the faculty who are responsible for the particular area. Students will have the opportunity to change area of concentration from that originally selected as they learn about the diversity of the major and its offerings. The B.S. degree earned will be in Environmental Science and Policy and in the area of concentration chosen. For administrative purposes, the students will be associated with the Colleges of their academic advisers.

**The Major**

Environmental Science and Policy students will take a core of 10 courses, including 9 lower-division courses chosen from restricted lists and a Capstone course required of all majors during their senior year, and upper-division courses defined by the area of concentration. After accounting for prerequisites, CORE courses, and upper-division requirements, any area of concentration may be completed while allowing approximately 24 hours of free electives in a normal 120-hour program leading to the B.S. degree.

## 114 Family Studies

- At least one course each from five of the following six groups: a) Biology (BSCI 106); b) Chemistry (CHEM 103); c) Earth Sciences (GEOL 120/110, GEOL 100/110, GEOG 201/211, NRSC 200, METO 200); d) Economics (AREC 240, ECON 200); e) Geography (GEOG 100, GEOG 170, GEOG 202); f) Government & Politics (GVPT 273, AREC 332).
- One semester of Calculus (MATH 140 or MATH 220)
- One semester of Statistics (BIOM 301, ECON 321, PSYC 200, SOCY 201, STAT 400)
- The Capstone course (ENSP 400 in the senior year)

### Areas of Concentration

Agroecology; Biodiversity and Conservation Biology; Earth Surface Processes; Environmental Economics; Environmental Management; Environmental Mapping and Data Management; Environmental Plant Protection; Environmental Politics and Policy; Land Use; Landscape Ecology; Society and Environmental Issues; Soil, Water, and Land Resources; Wildlife Resources and Conservation. Changes in concentrations are under review. Students should consult the program for updated information.

### Grading Policy

Beginning in spring 2002, students entering the Environmental Science and Policy Program are required to earn grades of C or higher in all courses taken within the ENSP core, and in all required courses and restricted electives of the selected area of concentration.

### Advising

Advising is mandatory each semester. Before registering, students should contact the Associate Director of ENSP to discuss the program requirements and options, and to explore their interests in possible areas of concentration.

Course Code: ENSP

## FAMILY STUDIES (FMST)

### College of Health and Human Performance

1204 Marie Mount Hall, (301) 405-3672  
[www.umd.edu/fmst](http://www.umd.edu/fmst)

Professor and Chair: Koblinsky  
Professors: Epstein, Hampton, Hofferth  
Associate Professors: Anderson, Leslie, Mokhtari, Myricks, Randolph, Rubin, Wallen  
Assistant Professors: Braun, Kim, La Taillade, Walker  
Instructors: Werlinich  
Lecturer: Davis  
Undergraduate Coordinator: Oravec

### The Major

The major in Family Studies emphasizes an understanding of the family as the primary social institution linking individuals to their world. The program has three interrelated foci: 1) the family as a unique and dynamic social unit, 2) individual and family development throughout the life span, and 3) the relationship of the family to its larger socio-cultural, historical, political and economic context. Courses examine family dynamics, changing family structures, ethnic families, intergenerational relations, family crises, family violence, family policy, legal problems, and family economics.

Students study prevention and intervention strategies for combating family problems. The reciprocal relationships between families and the social policies, practices and management of institutions and organizations are examined. The curriculum prepares students for careers in human services, human resource management, family life education, public policy and related positions emphasizing the family. Opportunities exist in public, private and non-profit agencies and institutions working with family members, entire family units or family issues. Graduates are also prepared for graduate study in the family sciences, family therapy, human services administration, health, law, social work, human resource management and other social and behavioral science disciplines and professions.

### Curriculum

**(a) Major subject area: A grade of C or better is required in these courses.**

FMST 302—Research Methods (3)  
FMST 330—Family Theories and Patterns (3)  
FMST 332—Children in Families (3)  
FMST 381—Poverty, Affluence, and Families (3)  
FMST 383—Delivery of Human Services to Families (3)  
FMST 432—Intergenerational Aspects of Family Living (3)  
FMST 477—Internship and Analysis in Family Studies (3)  
FMST 487—Legal Aspects of Family Problems (3)

**(b) Six additional departmental credits must be selected from any other FMST courses, with the exception of independent study (FMST 399, FMST 498) and field work (FMST 386, FMST 387). Must receive a grade of C or better. FMST 105 and FMST 298F cannot be used to meet this requirement unless they are taken before the student completes 56 credits.**

**(c) Additional courses. Required of all majors. All students must earn a grade of C or better in all courses applied toward completion of the major.**

FMST 290—Family Economics (3)  
or ECON 200—Principles of Microeconomics (4)  
or ECON 201—Principles of Macroeconomics (4)  
EDMS 451—Introduction to Educational Statistics (3)  
or STAT 100—Elementary Statistics and Probability (3)  
SOCY 100—Introduction to Sociology (3)  
or SOCY 105—Introduction to Contemporary Social Problems (3)  
PSYC 100—Introduction to Psychology (3)  
COMM 100—Foundations of Speech Communication (3)  
or COMM 107—Speech Communication: Principles and Practices (3)  
or COMM 125—Introduction to Interpersonal Communication (3)

Course Code: FMST

## FINANCE

For information, consult the Robert H. Smith School of Business entry in chapter 6.

## FIRE PROTECTION ENGINEERING (ENFP)

### A. James Clark School of Engineering

0151 Martin Hall, (301) 405-3992  
[www.enfp.umd.edu](http://www.enfp.umd.edu)

Professor and Chair: DiMarzo  
Associate Chair: Milke  
Professors: Brannigan, Quintiere  
Associate Professors: Milke, Mowrer, Trouve  
Assistant Professor: Marshall  
Lecturers (part-time): Gagnon, Koffel, Simone  
Emeriti: Bryan, Spivac  
Adjunct Professor: Kashiwagi

### The Major

Fire Protection Engineering is concerned with the applications of scientific and technical principles to the growth, mitigation, and suppression of fire. This includes the effects of fire on people, on structures, on commodities, and on operations. The identification of fire hazards and their risk, relative to the cost of protection, is an important aspect of fire safety design.

The practice of fire protection engineering has developed from the implementation and interpretation of codes and standards directed at fire safety. These safety codes contain technical information and prescriptions derived from experience and research. Research has also led to quantitative methods to assess aspects of fire and fire safety. Thus, fire protection engineers need to be versed in the current technical requirements for fire safety and in the scientific principles that underlie fire and its interactions.

The fire protection engineering student receives a fundamental engineering education involving the subjects of mathematics, physics, and chemistry. The program builds on other core engineering subjects of materials, fluid mechanics, thermodynamics and heat transfer with emphasis on principles

and phenomena related to fire. Fluid mechanics includes applications to sprinkler design, suppression systems, and smoke movement. Heat transfer introduces the student to principles of evaporation for liquid fuels. The subject of combustion is introduced involving premixed and diffusion flames, ignition and flame spread, and burning processes. Laboratory experience is gained by being exposed to standard fire tests and measurements. Design procedures are emphasized for systems involving suppression, detection, alarm, and building safety requirements. The background and application of codes and standards are studied to prepare the student for practice in the field. System concepts of fire safety and methods of analysis are presented. A senior design or research project is required which gives the student an opportunity to explore issues beyond the normal classroom environment.

In general, the curriculum is designed to give the student a grounding in the science and practice of fire safety. The field touches on many disciplines and its scientific basis is expanding. It is an engineering discipline that is still growing, and offers a variety of excellent career opportunities. These cover a wide spectrum involving safety assessment reviews, hazards analysis and research, loss prevention and regulatory issues.

## Requirements for Major

Freshman Year	Fall	Spring
CORE Program Requirements (Incl ENGL 101)	3	6
CHEM 135—General Chemistry for Engineers	3	
MATH 140, 141—Analysis I, II	4	4
ENES 100—Introduction to Engineering Design	3	
ENES 102—Statics	3	
PHYS 161—General Physics I	3	
ENFP 108 (optional)—Hot Topics in Fire		
<b>Total</b>	<b>13</b>	<b>16</b>

### Sophomore Year

CORE Requirements (incl. Diversity Courses)	3	3
MATH 240—Linear Algebra or	4	
MATH 241—Analysis III		
MATH 246—Differential Equations	3	
PHYS 262, 263—General Physics II	4	4
ENES 221, 220—Dynamics/Mechanics of Materials	3	3
ENFP 251—Introduction to Fire Protection Engineering	3	
ENFP 255—Fire Alarm and Special Hazards Design	3	
<b>Total</b>	<b>17</b>	<b>16</b>

### Junior Year

CORE Requirements	3	3
ENME 320—Thermodynamics*	3	
ENFP 300—Fire Protection Fluid Mechanics	3	
ENFP 310—Water Based Fire Protection Systems Design	3	
ENFP 312—Heat and Mass Transfer	3	
ENFP 320—Fire Assessment Methods and Laboratory	4	
ENFP 350—Professional Development Seminar	1	
General Elective - see advisor for details	3	
Approved Electives (STAT, ENFP, ENES, ENXX)**1	3	3
<b>Total</b>	<b>16</b>	<b>16</b>

### Senior Year

CORE Requirements	3	
ENFP 405—Structural Fire Protection	3	
ENFP 411—Fire Protection Hazard Analysis	3	
ENFP 415—Fire Dynamics	3	
ENFP 416—Problem Synthesis and Design	3	
ENFP 421—Life Safety and Risk Analysis	3	
ENFP 425—Fire Modelling	3	
Approved Electives (STAT, ENFP, ENES, ENXX)**1	3	3
<b>Total</b>	<b>15</b>	<b>12</b>
<b>Total Credit Hours</b>		<b>122</b>

\*ENME 320 is for non-ME majors. ENME 232 is usually for ME majors, but may be substituted w/permission.

\*\*At least 3 credits (1 course) of approved electives must be in ENFP. 3 credits (1 course) must also either be a statistics, mathematics or applied mathematics course.

An additional chemistry course(s) in organic, analytical or physical chemistry is recommended.

See the department for an additional listing of approved electives.

## Admission

Admission requirements are identical to those set by the A. James Clark School of Engineering. (See A. James Clark School of Engineering section in chapter 6.)

## Advising

Mandatory advising by department faculty is required of all students every semester. Students schedule their advising appointments in the department Office, 0151 Glenn L. Martin Hall, (301) 405-3992.

## Fieldwork and Internship Opportunities

Part-time and summer professional experience opportunities and paid internship information is available in the department Office, 0151 Glenn L. Martin Hall. See your advisor or the Coordinator: J. Milke, (301) 405-3992.

## Financial Assistance

Numerous scholarships and grants are available to students in the department from organizational and corporate sponsors. Information is available on eligibility, financial terms and retention criteria in the department Office. The majority of the scholarships are for junior and senior students, but some scholarships are available for first- and second-year students. Also refer to our web site at [www.enfp.umd.edu](http://www.enfp.umd.edu).

## Honors and Awards

Academic achievement awards are sponsored by the department and the student professional honor societies. These awards are presented at the annual A. James Clark School of Engineering Honors Convocation. Eligibility criteria for these awards are available in the department Office. Qualified students in the department are eligible for participation in the A. James Clark School of Engineering honors program.

## Student Organizations

The departmental honor society, Salamander, is open to academically eligible junior and senior students. The University of Maryland student chapter of the Society of Fire Protection Engineers is the professional society for all interested students in the department. Student membership in the National Fire Protection Association is available too. Information on these organizations may be obtained from current members in the student lounge, 1123 Engineering Laboratory Building, (301) 405-3992.

Course code: ENFP

## FOOD SCIENCE PROGRAM

Please see entry for Nutrition and Food Science later in this chapter.

## FRENCH AND ITALIAN LANGUAGES AND LITERATURES (FRIT)

### College of Arts and Humanities

3106C Jimenez Hall, (301) 405-4024

[www.inform.umd.edu/EdReq/Colleges/ARHU/Depts/FrenchItalian/](http://www.inform.umd.edu/EdReq/Colleges/ARHU/Depts/FrenchItalian/)

Professor and Chair: Verdagver

Professors: Brami, Julien, Mossman, Verdaguer

Associate Professors: Black, Campagne, Falvo, Letzter, Scullen

Assistant Professors: Eades, Wells

Lecturers: Amodeo, Clough, C. P. Russell

Emeriti: Fink, Hage, MacBain, Meijer, Russell, Tarica, Therrien

French and Italian are two of the world's great languages of culture, providing access to an outstanding body of literature and criticism, studies in the arts, the humanities, the social and natural sciences, and career opportunities in commerce, foreign affairs, and the academic world. The department seeks to provide an atmosphere conducive to cultural awareness and intellectual growth. It hosts active student clubs and a chapter of a national honor society. It supports two study abroad programs, Maryland-in-Nice and Maryland-in-Rome, and works actively with the French and Italian language clusters of the Language House.

## The French Major

Requirements for the French major include the College of Arts and Humanities requirements of 45 upper-level credits completed. The College foreign language requirement will be automatically fulfilled in the process of taking language major courses.

## 116 Geography

Changes in specific requirements are under review. Students should consult the department for updated information. The undergraduate major in French consists of 36 hours of French courses above FREN 201 or FREN 202. Two options, having the same core, lead to the Bachelor of Arts degree: (1) French language, culture, and literature, and (2) French/International Business. No grade lower than C may be used toward the major. Students intending to apply for teacher certification should consult the Director of Undergraduate Advising as early as possible for proper planning.

Students must take language acquisition courses sequentially, i.e., 201/202, 204, 301, etc. Once credit has been received in a higher-level language acquisition or grammar course, a lower-level course may not be taken for credit.

### Advising

Departmental advising is mandatory for second-semester sophomores and seniors. Undergraduate advisor: L. Clough

### Requirements

**Core required of all majors (12 credits): FREN 204, 250, 301, 401.**

Additional requirements outside French for both options: 12 credits in supporting courses as approved by department (six credits at 200-level and six credits at 300-400 level).

#### French Language, Culture and Literature Option (24 credits)

In addition to core: FREN 351, 352; 311 or 312, 302 or 303; four additional 400-level courses of which only one may be in English.

#### French and International Business Option (24 credits)

In addition to core: FREN 302, 303, 306, 311, 312 or 404; 406; two of the following: 351, 352, 471, 472, 473, 474.

### Honors

A student may choose to do a departmental Honors version in the French Language Culture and Literature Option. The requirements are the same except that at least three of the upper-level courses, beginning with FREN 351, must be taken in the "H" version, and that, in addition to those courses regularly taken for the major, the Honors student will take FREN 495H (Honors Thesis), for a total of 39 hours in French. For further information, consult the coordinator of the French Honors Program.

### The Italian Major

The undergraduate major in Italian consists of 36 hours of Italian courses above ITAL 203. To satisfy the major requirements, students must take the following courses: the language sequence: ITAL 204, 211, 301, and either 302 or 311; the literature sequence: 251, 350; six courses at the 400-level, of which only one may be in English. No grade lower than C may be used to satisfy the major requirements. Additional requirements outside Italian: 12 credits in supporting courses as approved by the department; or at least 12 credits (six credits at the 200-level and six credits at the 300-400 level) in one specific area, representing a coordinated plan of study.

Students must take language acquisition courses sequentially, i.e., 203, 204, 301, etc. Once credit has been received in a higher-level language acquisition or grammar course, a lower-level course may not be taken for credit.

### Romance Languages

Either French or Italian, or both, may serve as components of this major (see the entry on the Romance Language Program).

Course Codes: FREN, ITAL

### Citations

#### Citation in French Language and Cultures

15 credit hours. Five courses in French above 201/202. Courses taken through Study Abroad programs may be applied. Contact the Undergraduate Advisor for more information.

#### Citation in Business Management for French Majors (1102B)

15 credit hours. ECON 200 and four courses from approved list of BMGT courses. Contact Business, Culture and Languages Program at (301) 405-2621 for more information.

#### Citation in Business French

15 credit hours. Five courses in French from approved list of courses. Contact Business, Culture and Languages Program at (301) 405-2621 for more information.

#### Citation in Italian Language and Culture

15 credit hours. ITAL 204, 211, 311 and two courses from approved list of courses. Contact the Director of Undergraduate Studies for more information.

Students who fulfill Citation requirements will receive a Citation on the official transcript.

## GEOGRAPHY (GEOG)

### College of Behavioral and Social Sciences

2181 LeFrak Hall, (301) 405-4050

[www.geog.umd.edu](http://www.geog.umd.edu)

Chair: Townshend

Associate Chair: Cirrincione

Professors: Christian, Goward, Justice, Prince, Townshend

Associate Professors: Brodsky, Cirrincione\* (Curriculum and Instruction),

DeFries\* (ESSIC), Dubayah, Geores, Kasischke, Kearney, Liang

Assistant Professors: Albrecht, Dibble, Kleidon

Lecturers: Eney, Kinerney, Zlatic

Professors Emeritus: Harper, Thompson, Wiedel

Adjunct Faculty: Douglas, Townsend, Tucker, Walthall, Williams

\*Joint appointment with unit indicated.

### The Major

The Department of Geography offers programs of study leading to the Bachelor of Science (B.S.) degree. Many students find that the multiple perspectives of geography form an excellent base for a liberal arts education. The abilities to write clearly and to synthesize information and concepts are valued highly in geographical education and practice. Students of geography must master substantive knowledge either in the physical/natural sciences or in the behavioral/social sciences in addition to methodological knowledge. Some advanced geography courses, such as geomorphology and climatology are physical science oriented; economic geography, urban systems, and population geography focus on the social sciences, while environmental studies, ecology, and the geography of human dimensions of global change combine the two. International interests are best pursued with complementary study in foreign languages and area studies.

The central question in geographical study is "where?" Geographers research locational questions of the natural environment, of social and economic systems, and of past human activity on the land. Students of geography must master a variety of techniques that are useful in locational analysis, including computer applications and mapping, map making or cartography, air-photo interpretation and remote sensing, field observation, statistical analysis, and mathematical modelling.

Increasingly, geographers apply their combined methodological and substantive knowledge towards the solution of society's problems. Some graduates find geography to be an excellent background for careers in defense and intelligence, journalism, law, travel and tourism, the nonprofit sector, and business and management. Most professional career positions in geography require graduate training. Many geographers take positions in scientific research, planning, management and policy analysis for both government and private agencies.

### Major Requirements Including Program Options

Within any of the specializations available in the geography major program it is possible for students to adjust their programs to fit their individual interests. The geography major totals 35 semester hours. In addition to the 35 semester hours, the geography major is required to take an additional 15 semester hours of supporting course work outside of the department. The hours can be either in one department or in an area of specialization. An area of specialization requires that a written program of courses be reviewed and placed on file by the department adviser. See Advising Office,

Lefrak 2108, (301) 405-8085, e-mail geog-advise@umail.umd.edu, web page: www.inform.umd.edu/GEOG. Supporting courses generally are related to the area of specialty in geography. The pass-fail option is not applicable to major or supporting courses. A minimum grade of C in each course is required for major and supporting courses.

The required courses for geography majors are as follows:

	<b>Semester Credit Hours</b>
Primary Courses (GEOG 201, 202, 211, 212) .....	8
An upper-level physical geography course .....	3
An upper-level human geography course .....	3
An upper-level geographic technique course .....	3
Upper-level geography electives .....	15
Quantitative Methods or Statistics (e.g. GEOG 305 or its equivalent) .....	3
<b>Total .....</b>	<b>35</b>

### Geography Primary Courses

The following four courses provide the initial base of the Geography Program:

GEOG 201—Geography of Environmental Systems .....	3
GEOG 202—The World in Cultural Perspective .....	3
GEOG 211—Geography of Environmental Systems Laboratory .....	1
GEOG 212—The World in Cultural Perspective Lab .....	1

### Upper-Level Elective

At least one upper-level course each in physical geography, human geography, and geographic technique is required regardless of the speciality of the individual student's program. These courses build on the initial base provided by the Primary Courses, and also serve as the basis for selection of upper-level geography courses.

### Suggested Program of Study for Geography

	<b>Semester Credit Hours</b>
<b>Freshman Year</b>	
ENGL 101—Introduction to Writing .....	3
MATH 110—Elementary Mathematical Models .....	3
or MATH 115—Precalculus	
University CORE Distributive Studies .....	24
(To be chosen from the three categories of Humanities-Arts, Math-Sciences, and Social Sciences)	
<b>Sophomore Year</b>	
University CORE Distributive Studies .....	4
(To be chosen from Math-Sciences lecture-laboratory courses)	
GEOG 201—Geography of Environmental Systems .....	3
GEOG 202—The World in Cultural Perspective .....	3
GEOG 211—Geography of Environmental Systems Lab .....	1
GEOG 212—The World in Cultural Perspective Lab .....	1
Quantitative Methods (GEOG 305 or its equivalent) .....	3
Electives .....	15
<b>Junior Year</b>	
ENGL 391 or GEOG 310 .....	3
CORE Advanced Studies .....	3
Advanced Human Geography .....	3
Advanced Physical Geography .....	3
Advanced Technique Geography .....	3
Geography Upper-Level Elective .....	3
Electives .....	12
<b>Senior Year</b>	
Geography Upper-Level Electives .....	12
Electives .....	18
<b>Total .....</b>	<b>120</b>

### Introduction to Geography

The 100-level geography courses are general education courses for persons who have had no previous contact with the discipline in high school or for persons planning to take only one course in geography. They provide general overviews of the field or in one of its major topics. Credit for these courses is not applied to the major.

### Related Programs

#### Geographic Information Science/Computer Cartography Program

The Geography Department offers an important area of specialization: GIS and Computer Cartography. The Bachelor of Science degree program in Geographic Information Science and Computer Cartography is designed to give students the technical skills needed to acquire, manage and analyze very large amounts of geographic data. Students will get extensive computer training in digital processing of remote sensing observations and cartographic vector data, spatial analysis, and the display of information products. Almost everything we do involves geographic information, from deciding where to live and travel, to environmental monitoring and urban planning. Influenced by computer technology, the academic disciplines of geographic information science such as remote sensing, geographic information systems (GIS), and computer cartography have evolved dramatically in the past few decades. Remote sensing is the science of obtaining geographic information from aircraft and satellites. GIS technology manages and analyzes different forms of digital geographic data, and this field has been growing at an extraordinary rate. Computer cartography has revolutionized traditional cartography to vastly improve map making and visualization of geographic information in a multimedia environment.

Students concentrating in GIS/Cartography must take the Geography Primary courses, totalling eight hours: one upper-level course in physical geography, and one in human geography plus six hours of systematic electives, totalling 12 hours; and Cartography/Geographic technique courses, totalling 15 hours. Supporting area courses must be taken from a list provided by the department. All math programs should be approved by a departmental adviser.

#### Geography and Social Studies Education Double Major

In conjunction with the Department of Curriculum and Instruction, the Geography Department offers a special 121 credit hours program for students wishing to double major in Geography and Social Studies Education - Geography Concentration, allowing them to teach geography at the secondary level. Early examination of requirements is encouraged to reduce the number of additional hours required. In addition to the Geography Departments required credits, the program requires 28 credit hours of course work in history and the social sciences. For a list of requirements, contact the Geography Undergraduate Advising Office. Requirements are also listed under the Department of Curriculum and Instruction Social Studies Education - Geography Concentration double major option.

### Citations

#### Citation in Geographic Information Science (GIS)

13 credit hours. GEOG 201, GEOG 211, GEOG 371, GEOG 372, GEOG 373. See undergraduate advising office for details, LeFrak Hall 2108, (301) 405-4073.

### Internship Opportunities

The department offers a one-semester internship program for undergraduates (GEOG 384 and 385). The goal of the program is to enhance undergraduates' intellectual growth and career opportunities. The internship provides an opportunity for the students to expand their understanding of the field by linking the theoretical aspects of geography acquired in the classroom to the applied aspects operating in a practice situation. The internship program is open only to geography juniors and seniors. All interns must have completed the following prerequisites: GEOG 201/211, 202/212, 305 or its equivalent, and the upper-level writing requirement. An application form from the undergraduate geography adviser must be submitted one semester before the internship is desired. See undergraduate advising office, 2108 LeFrak Hall, (301) 405-4073 for information.

### Honors

For information on the geography honors program, contact the undergraduate adviser.

### Student Organizations

Gamma Theta Upsilon, the geography undergraduate organization, operates a program of student-sponsored talks and field trips. Information may be obtained from Professor Dubayah, 1161 LeFrak Hall, (301) 405-4069.

Course Code: GEOG

# 118 Geology

## GEOLGY (GEOL)

### College of Computer, Mathematical and Physical Sciences

1115 Geology Building, (301) 405-4365

www.geol.umd.edu

Professor and Chair: Brown

Professors: Candela, Chang, Rudnick, Walker, Wylie†

Associate Professors: McDonough, Prestegaard, Ridky, Stifel (emeritus)

Assistant Professors: Farquhar, Jiang, Kaufman, Lower

Adjunct Professor: Zen

Adjunct Associate Professors: Luhr, McLellan, Shirey, Sorensen

Adjunct Assistant Professors: Bohlke, Hanchar

Assistant Research Scientists: Becker, Friedmann, Piccoli, Tomascak

Lecturers: Holtz, Merck

Affiliate Faculty: Busalacchi, Fahnestock

†Distinguished Scholar Teacher

### The Major

Geology is the science of the Earth. In its broadest sense, geology concerns itself with planetary formation and subsequent modification, with emphasis on the study of planet Earth. Geologists study Earth's internal and surficial structure and materials, the chemical and physical processes acting within and on the Earth, and utilize the principles of mathematics, physics, chemistry, and biology to understand our planet and its environments.

Geological Studies encompass all the physical, chemical, and biological aspects of Earth. Increasingly, geologists are taking a holistic approach in the collection and interpretation of data about the Earth, which means that the wider context of the geological sciences is broad and diverse. In studying the Earth as a system, we are concerned with geology and geophysics, hydrology, oceanography and marine science, meteorology and atmospheric science, planetary science, and soil science. A major in any relevant discipline can lead to a satisfying career within the geological sciences. In general, graduate training is expected for advancement to the most rewarding positions and for academic employment.

Geologists are employed by governmental, industrial, and academic organizations. Geologists work in exploration for new mineral and hydrocarbon resources, as consultants on engineering and environmental projects, as teachers and researchers in universities, and in many other challenging positions. For many, the attraction of a career in geology is the ability to divide time between work in the field, the laboratory, and the office. Although the employment outlook within geology varies with the global economic climate, the long-range outlook is good. This is because our dwindling energy, mineral, and water resources, along with increasing concerns about natural hazards and environmental issues, present new challenges for geologists.

The Geology Program at Maryland includes a broad range of undergraduate courses to accommodate both Geology majors and students within the Environmental Science and Policy Program. Within the Geology major, a requirement exists for a senior undergraduate research project to be performed under the direction of a faculty adviser. This requirement provides invaluable experience in writing proposals and reports, gathering, analyzing and evaluating data, and delivering scientific talks. In addition, a Departmental Honors Program and a combined B.S./M.S. Program are available.

### Requirements for the Geology Major, Professional Track

The geology curriculum is designed to meet the requirements of industry, graduate school, and government. For the B.S. degree, the students are required to complete the departmental requirements (49 credits) and the supporting requirements (23/24 credits) in addition to the CORE (general education) Program requirements. The department also requires that to receive a degree in geology, students must have a grade of C or better in the required geology courses, and an average of C or better in the supporting courses.

Courses required for the B.S. in Geology are listed below. Some courses require field trips for which the students are expected to pay for room (if required) and board. Field camp is taken during the summer at institutions other than the University of Maryland, College Park, that offer camps approved by the department.

Semester  
Credit Hours

CORE Program Requirements\* .....46

### Geology Courses

One of the following: .....	4
GEOL 100/110—Physical Geology and Laboratory	
GEOL 120/110—Environmental Geology and Lab	
GEOL 102—Historical Geology .....	4
GEOL 322—Mineralogy .....	4
GEOL 340—Geomorphology .....	4
GEOL 341—Structural Geology .....	4
GEOL 342—Stratigraphy and Sedimentation .....	4
GEOL 393—Technical Writing .....	3
GEOL 394—Research Problems .....	3
GEOL 445—Geochemistry .....	3
GEOL 451—Groundwater .....	3
GEOL 423—Optical Mineralogy .....	3
GEOL 443—Petrology .....	4
GEOL 490—Field Camp .....	6
.....	49

### Supporting Requirements

CHEM 103—General Chemistry I .....	4
CHEM 113—General Chemistry II .....	4
MATH 140—Calculus I .....	4
MATH 141—Calculus II .....	4
PHYS 141—General Physics .....	4
One of the following .....	3-4
PHYS 142—General Physics	
BIOM 301—Introduction to Biometrics	
Any upper-level Geology course	
Credit hours-supporting requirement .....	23-24

\*Of the normal CORE requirements (46 credit hours), at least 13-14 credits are met by the major requirements in Mathematics, Chemistry, Geology or Physics (Mathematics and the sciences area).

### Requirements for the Geology Major, Secondary Education Track

The Secondary Education Track in Geology leads to a B. S. Degree in Geology with special emphasis on course work that helps prepare the student for teaching at the secondary school level. Further coursework and student teaching are required for an education certification. This track also prepares the student for work as a geologist in government or industry, or for further graduate study, although students primarily intending to attend graduate school in Geology are advised to choose the Professional Track.

Relative to the professional Geology track, in the secondary education track there is a reduction of two upper-level Geology course requirements, but the addition of two Education courses and a Meteorology requirement. Further coursework in Education (including student teaching) will be required in order to obtain a Maryland State Teaching Certification. Although Geology is by nature interdisciplinary, it is recommended that students consider taking additional courses in Astronomy, Biology and the philosophy of science in order to add to their educational breadth.

Semester  
Credit Hours

CORE Program Requirements\*\* .....

\*\*excluding mathematics, science and one capstone requirement

### Geology Requirements

One of the following: .....	4
GEOL 100/110—Physical Geology and Laboratory	
GEOL 120/110—Environmental Geology and Lab	
GEOL 102—Historical Geology .....	4
GEOL 322—Mineralogy .....	4
GEOL 340—Geomorphology .....	4
GEOL 341—Structural Geology .....	4
GEOL 393—Technical Writing .....	3
GEOL 394—Research Problems (Capstone) .....	3
GEOL 490—Field Camp .....	6

Plus 3 courses selected from:

GEOL 342—Stratigraphy and Sedimentation .....	4
GEOL 445—Geochemistry .....	3
GEOL 451—Groundwater .....	3
GEOL 423—Optical Mineralogy .....	3
GEOL 443—Petrology .....	4
Credit hours—Geology requirement .....	41-43

**Supporting Requirements**

METO 200—Weather and Climate .....	3
CHEM 103—General Chemistry I .....	4
CHEM 113—General Chemistry II .....	4
MATH 140—Calculus I .....	4
MATH 141—Calculus II .....	4
PHYS 141—General Physics .....	4
Credit hours—supporting requirement .....	23

**Education Requirements**

6 credits chosen from the following:

EDPL 301—Foundations of Education .....	3
<b>OR</b> EDPL 401—Educational Technology, Policy, and Social Change .....	3
EDHD 413—Adolescent Development .....	3
EDHD 426—Cognitive and Motivational Basis of Reading I .....	3
EDCI 463—Teaching Reading in Content Area II .....	3
Credit hours—Education requirement .....	6

**Recommended:**

ASTR 100 or 101—Astronomy  
 BSCI 105 and BSCI 106—Principles of Biology I and II  
 PHIL 250/HIST 174—Philosophy/History of Science  
 PHYS 142—General Physics, second semester  
 The remaining 6 credits of the Education courses listed above

**Combined B.S./M.S. in Geology**

The Combined B.S./M.S. program is designed to permit a superior student to earn both the Bachelor's and the Master's degrees following five years of study. The combined program is an integrated experience of undergraduate and graduate work. Nine credits of graduate courses taken as an undergraduate can be counted towards both the B.S. and M.S. degrees. The master's thesis may be a continuation of work began as part of the undergraduate senior thesis.

Acceptance into the Combined B.S./M.S. normally would occur after the end of the sophomore year. The minimum requirements for acceptance into this program are similar to those for the Geology Honors program and are:

1. An overall GPA of at least 3.0 at the end of the sophomore year and a GPA of 3.0 or better in all courses required for the major.
2. At least three letters of recommendation.
3. An essay or statement of purpose.
4. An interview with the undergraduate Honors Director and the Graduate Director.

The Combined B.S./M.S. program allows 9 credits of graduate courses (600-level or above) to be counted towards both the B.S. and M.S. degrees. A grade of "B" or better must be earned in each of these courses.

Continued progress in the program requires completion of the undergraduate curriculum, a GPA of 3.5 or better in GEOL 393 and GEOL 394, and maintenance of a 3.0 overall GPA and a GPA of 3.0 or better in all courses required for the major. The requirements for admission into the graduate program must also be met, including receiving acceptable scores in the General GRE exam, usually taken during the fall term of the senior year.

**Requirements for the M.S. Degree**

There are no changes from the current requirements. Students must complete 24 credits of course work approved by the Graduate Committee and 6 credits of thesis research and defend a research proposal and a thesis. Students in the Combined B.S./M.S. may bring forward up to 9 credits at the 600 level from their B.S. program.

**Geology Department Citations**

An Undergraduate Citation recognizes concentrated study in a designated field in the College of Computer, Mathematical, and Physical Sciences. The award of a Citation will be noted on the student's transcript at the time of graduation.

These citations may be earned by students not majoring in Geology and are administered by the Geology Undergraduate Studies Director. A grade of "C" or better must be earned in all courses required for the citation. See [www.geol.umd.edu](http://www.geol.umd.edu) for more information.

**Surficial Geology Citation**

Required: GEOL 120/110 (Environmental Geology/Lab), GEOL 123 (Global Change), GEOL 340 (Geomorphology), Plus one of: GEOL 451 (Groundwater Geology), GEOL 452 (Wetland & Watershed Hydrology), GEOL 462 (Geological Remote Sensing)

**Earth Material Properties Citation**

Required: GEOL 100/110 (Physical Geology/Lab), GEOL 322 (Groundwater Mineralogy), Plus two from: GEOL 210 (Gems and Gemstones), GEOL 341 (Structural Geology), GEOL 423 (Optical Mineralogy), GEOL 443 (Petrology), GEOL 445 (Geochemistry)

**Earth History Citation**

Required: GEOL 100/110 (Physical Geology/Lab), GEOL 102 (Historical Geology), Plus two from: GEOL 331 (Invertebrate Paleontology), GEOL 342 (Sedimentation & Stratigraphy), GEOL 436 (Biogeochemistry)

**Hydrology Citation**

Required: GEOL 100/110 (Physical Geology/Lab), GEOL 342 (Sedimentation & Stratigraphy), Plus two from: GEOL 436 (Biogeochemistry), GEOL 445 (Geochemistry), GEOL 451 (Groundwater Hydrology) (3) GEOL 452 (Wetland & Watershed Hydrology)

All Geology citations are an appropriate disciplinary combination with Astronomy, Computer Science, Mathematics or Physics majors within the CMPS college. The citations are also targeted at majors outside the college, with appropriate matches including:

- Geography/Remote Sensing Students (Surficial Geology)
- Engineering and Material Science students (Earth Material Properties)
- Evolutionary Biology and Physical Anthropology students (Earth History)
- Biology, Biological Diversity and Ecology students (Hydrology)

**Advising**

The Geology Undergraduate Studies Director serves as the advisor for the geology majors, 1119 Geology Building, (301) 405-4379.

**Honors**

Admission to the Program is by invitation of the Honors Committee, normally at the end of the sophomore year and normally will be extended to students with an overall GPA of 3.0 or better and a GPA of 3.0 or better in all courses required for the major.

Graduation with Honors normally requires completion of the curriculum, a GPA of 3.5 or better in GEOL 393H and GEOL 394H, and maintenance of a 3.0 overall GPA and a GPA of 3.0 or better in all courses required for the major. Maintenance of a GPA of 3.5 or above and a grade of A in both GEOL 393H and GEOL 394H will earn the distinction of Graduation with High Honors.

The curriculum for Honors in Geology follows the University Honors Program Track I: Thesis Option with a 15 credit minimum.

1. The requirement for upper division Honors courses will be met by a minimum of 9 hours as follows:
  - a. GEOL 489H Recent Advances in Geology (3 credit hours), and
  - b. 6 credit hours from the following:
    - i) a 3 credit hour graduate-level course approved by the Departmental Honors Committee,

## 120 Germanic Studies

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- ii) Honors Option project in a three or four credit hour upper-level course from the offerings in the Geology Department. The Honors Option Proposal must be approved by the Departmental Honors Committee, the professor teaching the course and the University Honors Program. A proposal must be approved by the Department and submitted to the University Honors Program by the 10th day of class in the semester in which the course will be taken and the project completed.
2. The research and thesis requirement will be met by completion of GEOL 393H and GEOL 394H with a GPA of 3.5 or better (6 credit hours).

### Honors and Awards

Bengt Svenonius Memorial Scholarship for graduating senior with the highest overall scholastic average; Fernow Memorial Faculty Field Camp Awards for geology majors to attend geology summer camp; Sigma Gamma Epsilon Award for a senior in geology for Outstanding Scholastic Achievement and service to the Society; and Best Senior Research Award.

### Student Organizations

Sigma Gamma Epsilon, National Honor Society for Earth Sciences, and the Geology Club.

Course Code: GEOL

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## GERMANIC STUDIES (GERM)

### College of Arts and Humanities

3215 Jimenez Hall, (301) 405-4091

Professor and Acting Chair: Pfister  
Professors: Beicken, Oster, Pfister, Frederiksen†  
Associate Professors: Fleck, Strauch  
Assistant Professor: Alene Moyer  
Emeriti: Best, Herin, Jones  
†Distinguished Scholar Teacher

**Changes in major requirements are under review. For more information, please contact the department at (301) 405-4091 or Dr. Pfister at (301) 405-4106.**

### The Major

The undergraduate major in Germanic Studies consists of 36 hours beyond the basic language acquisition sequence (GERM 101-201). No course completed with a grade lower than C may be used to satisfy the major requirements. Three program options lead to the Bachelor of Arts (B.A.) degree: 1) German language, 2) German literature, and 3) Germanic area studies. Secondary concentration and supportive electives are encouraged in the other foreign languages, comparative literature, English, history, and philosophy. Majors intending to go on to graduate study in the discipline are urged to develop a strong secondary concentration in a further area of Germanic studies; such "internal minors" are available in German language, German literature, Scandinavian studies, and Indo-European and Germanic philology. All majors must meet with a departmental adviser at least once each semester to update their departmental files and obtain written approval of their program of study.

### Advising

Departmental advising is mandatory for second-semester sophomores, juniors, and seniors.

### Requirements for Major

Requirements for the Germanic Studies major include the College of Arts and Humanities requirement of 45 upper-level credits completed.

The College foreign-language requirement will be automatically fulfilled in the process of taking language major courses.

#### German Language Option

CORE: 220, 301, 302, 321, and 322. Specialization: three of four German language courses (401, 403, 405, 419P); two 400-level German literature courses; two upper-level courses in any of the three areas of specialization.

#### German Literature Option

CORE: 220, 301, 302, 321, and 322. Specialization: five 400-level German literature courses; two upper-level courses in any of the three areas of specialization.

#### Germanic Area Studies Option

CORE: 220, 301, 302, 321, and 322. Modern Scandinavian Specialization: 369, 461; five upper-level courses in the Germanic area studies group. Medieval Scandinavian Specialization: 383, 475; five upper-level courses in the Germanic area studies group.

Also available is a German Business Option, an International Business-German Business Option, and an Engineering-German dual degree. Students should contact a departmental adviser for more information.

Students must take language-acquisition courses sequentially, i.e., 101, 102, 201, 202, etc. Once credit has been received in a higher-level language acquisition or grammar course, a lower-level course may not be taken for credit.

### Honors in German

The department offers an extensive Honors Program for majors. The Honors Program affords Honors students sustained individual contact with faculty members. Honors Students are called on to work independently, to pursue a project that carries them beyond the regular undergraduate curriculum. Interested students should ask for detailed information from the department Honors Studies Director.

### Citations

#### Citation in Germanic Studies

15 credit hours. GERM 202 and 220 and/or 301. Two or three additional courses from approved list of courses. Courses taken through Study Abroad programs may be applied. Contact the Director of Undergraduate Studies for more information.

#### Citation in Business Management for German Majors (1103B)

15 credit hours. ECON 200 and four courses from approved list of BMGT courses. Contact Business, Culture and Language Program at (301) 405-2621 for more information.

#### Citation in Business German

15 credit hours. Five courses in German from approved list of courses. Contact Business, Culture and Language programs at (301) 405-2621 for more information.

Students who fulfill Citation requirements will receive a Citation on the official transcript.

Course Code: GERM

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## GOVERNMENT AND POLITICS (GVPT)

### College of Behavioral and Social Sciences

3140 Tydings Hall, (301) 405-4156

[www.bsos.umd.edu/gvpt](http://www.bsos.umd.edu/gvpt)

Professor and Chair: Lichbach  
Professors: Alford†, Alperovitz, Barber, Butterworth†, Elkin, Franca, Gimpel, Glass†, Graber, Heisler, Herrnson, Lichbach, Oppenheimer†, Pearson, Phillips, Pirages, Quester, Terchek, Telhami, Tismaneanu†, Uslander, Walters\*  
(African American Studies)  
Associate Professors: Conca, Davenport, Grob, Haufler, Kaminski, Lalman, McIntosh, Schreurs, Soltan, Swistak, Williams, Wilson\* (African American Studies)  
Assistant Professors: Howard, Kaufmann, Kim, Morris, Schwedler  
Lecturer: Vietri  
†Distinguished Scholar Teacher  
\*Joint Appointment with unit indicated

The Department of Government and Politics offers programs for the general student as well as for students who are interested in careers in government, the public sector, politics, foreign assignments, teaching, a variety of graduate programs, and law schools. Satisfactory completion of requirements leads to a Bachelor of Arts degree in government and politics.

The study of politics is both an ancient discipline and a modern social science. The origin of the discipline can be traced back to the earliest times when philosophers, statesmen, and citizens studied the nature of government, justice, responsibility, and the consequences of political action. More recently, the study of politics has also emphasized scientific analysis and methods of observations about politics. Today, the discipline reflects a broad effort to collect data about politics and governments utilizing relatively new techniques developed by all of the social sciences.

The Department of Government and Politics combines philosophical and scientific concerns in its overall program as well as in specific courses. It emphasizes such broad areas as political development, policy analysis, social justice, political economy, conflict, and human rights. These broad conceptual areas are integral components of study in the discipline. The areas are commonly referred to as American government and politics; comparative government; political theory; international relations; public administration; public law; public policy and political behavior.

## Majoring in Government and Politics and the Academic Review

Government and Politics is a limited enrollment program that has special requirements for admission, such as minimum GPA guidelines and required courses. Students planning on transferring into the major should contact the department for details on Limited Enrollment requirements. Students admitted as incoming freshman will have their academic review after 45 credits.

### Requirements for Major

Government and Politics majors must complete 36 semester hours of GVPT courses with a minimum grade of C in each course. At least 18 of the 36 credits must be in upper-level courses and all majors are required to complete GVPT 100, GVPT 170, and GVPT 241.

In addition, all majors must complete ECON 200, an approved skills option (a foreign language or three quantitative courses from a select list), and a secondary area of concentration in another department or approved interdisciplinary area. All courses used to satisfy these requirements must be completed with a minimum grade of C.

### Honors Program

All students majoring in government may apply for admission to the GVPT Honors Program. Additional information concerning the Honors Program may be obtained at the department offices.

### Internships

The department offers students a variety of internship experiences. Only nine hours of graded GVPT internship credit will apply to the 36 hours needed in the major. Internship credit graded on a pass/fail basis may not be used to satisfy the GVPT major requirements. In no case may more than 12 internship credits be counted towards the 120 credits needed to graduate. Internships are generally open only to GVPT majors with junior standing and a 3.0 GPA.

### Advising

Academic advising is available daily on a walk-in or appointment basis in the Undergraduate Advising Office, 1155 Tydings Hall.

Course Code: GVPT

## HEARING AND SPEECH SCIENCES (HESP)

### College of Behavioral and Social Sciences

0100 Lefrak Hall, (301) 405-4214  
[www.bsos.umd.edu/hesp/](http://www.bsos.umd.edu/hesp/)

Professor and Chair: Ratner

Professors: Gordon-Salant, McCall (Emeritus), Yeni-Komshian (Emerita)

Associate Professors: Roth

Assistant Professors: Fitzgerald, Haermann, Hicks, Newman

Instructors: Antonisse, Banson, Battles, Davis, Don Frattali, Handy, McCabe, Palmer, Park, Perlrath, Samlan, Sherlock, Sisskin, Sonies, Wijisinghe, Williams, Worthington

Affiliate Professor: Stone

Adjunct Associate Professor: Ch-Fishman

Adjunct Professor: Grafman

## The Major

Hearing and speech sciences is an inherently interdisciplinary field, integrating knowledge from the physical and biological sciences, medicine, psychology, linguistics, and education in order to understand human communication and its disorders. The department curriculum leads to the Bachelor of Arts degree. An undergraduate major in this field is an appropriate background for graduate training in Speech-Language Pathology or Audiology, as well as for graduate work in other disciplines requiring a knowledge of normal or disordered speech language, or hearing. The student who wishes to work professionally as a speech-language pathologist or audiologist must obtain a graduate degree in order to meet national certification requirements, and most state licensure laws.

The hearing and speech sciences curriculum is designed in part to provide supporting course work for majors in related fields, so most course offerings are available to both departmental majors and non-majors. Permission of instructor may be obtained for waiver of course prerequisites for non-majors wishing to take hearing and speech courses of interest.

### Requirements for Major

A student majoring in hearing and speech sciences must complete 33 semester hours of required courses (HESP 120, 202, HESP 300, HESP 305, HESP 311, HESP 400, HESP 402, HESP 403, HESP 404, or HESP 406, HESP 407 and HESP 411) and six semester hours of electives in the department to satisfy major course requirements. No course with a grade less than C may count toward major course requirements. In addition to the 36 semester hours needed for a major, 9 semester hours of supporting courses in statistics and other related fields are required. For these 12 hours, a C average is required. In addition, when a HESP course has a listed pre-requisite, this pre-requisite must have been completed with a grade of C or better before registration in the subsequent course will be approved.

A guide to the major is available through the department office in room O100 Lefrak or on the departmental website at [www.bsos.umd.edu/hesp/](http://www.bsos.umd.edu/hesp/)

Course sequencing is extremely important within this major. Advising for majors is mandatory.

#### Required courses for the HESP major:

HESP 202—Introduction to Hearing and Speech Sciences .....	3
HESP 120—Introduction to Linguistics .....	3
PSYC 100—Introduction to Psychology .....	3
HESP 300—Introduction to Psycholinguistics .....	3
HESP 305—Anatomy and Physiology of the Speech Mechanism .....	3
HESP 311—Anatomy, Physiology, and Pathology of the Auditory System ...	3
HESP 400—Speech and Language Development in Children .....	3
HESP 402—Speech Pathology I: Language Disorders in Children .....	3
HESP 403—Introduction to Phonetic Science .....	3
HESP 404—Speech Pathology II: Voice and Fluency Disorders .....	3
OR	
HESP 406—Speech Pathology III: Aphasia and neuromotor disorders .....	3
HESP 407—Bases of Hearing Science .....	3
HESP 411—Introduction to Audiology .....	3

#### Electives—Students must take six credits from the following offerings:

HESP 109—Freshman seminar .....	3
HESP 386—Experiential Learning .....	3
HESP 417—Principles and Methods in Speech Language Pathology and Audiology.....	3
HESP 418—Clinical Practice in Speech Language Pathology and Audiology	3
HESP 420—Deafness and sign language .....	3
HESP 422—Neurological bases of human communication .....	3
HESP 423—Phonetics for teachers of English as a second language .....	3
HESP 469—Honors thesis research .....	3
HESP 498—Seminar in Hearing and Speech Sciences (topics vary).....	3
HESP 499—Independent Study .....	3

#### Allied/Related Fields (12 credits):

In addition to a required statistics course, the student will take six credits from course offerings in Allied/Related Fields and PSYC 100. A full list of these offerings is available in the Hearing and Speech Sciences Department undergraduate guide.

## Departmental Honors

An Honors option in HESP is available to students. This option must be declared prior to the junior year, and requires a 3.5 or higher GPA overall and in HESP coursework. For specific information on procedures for completing the Honors option, consult the Undergraduate Director or the department guide.

## 122 History

### Advising

Information on advising for hearing and speech sciences may be obtained by calling the department office, (301) 405-4214. An undergraduate program guide is available through the department office at 0100 Lefrak, or on the web at [www.bsos.umd.edu/hesp/](http://www.bsos.umd.edu/hesp/)

### Special Opportunities

The Department operates a sizeable Hearing and Speech Clinic (301-405-4218) and an award-winning language enrichment preschool, the LEAP program. Both serve the campus and greater metropolitan area, and provide in-house opportunities for clinical observation and training. The department facilities also include a number of well-equipped speech, language and hearing research laboratories.

### Student Organizations

Hearing and speech majors are invited to join the department branch of the National Student Speech-Language and Hearing Association (NSSLHA).

Course Code: HESP

## HISTORY (HIST)

### College of Arts and Humanities

2115 Francis Scott Key Hall, (301) 405-4265  
[www.umd.edu/ARHU/Depts/History/](http://www.umd.edu/ARHU/Depts/History/)

Professor and Chair: Lampe

Distinguished University Professors: Berlin, Brush, Gilbert, Harlan† (Emeritus)

Professors: Bedos-Rezak, Belz, Callcott (Emeritus), Cockburn (Emeritus), Cole† (Emeritus), Eckstein, Evans (Emeritus), Foust (Emeritus), Friedel, Gerstle, Gordon (Emeritus), Gullickson, Harris, Henretta†, Herf, Holm, Jashemski† (Emerita), Kent (Emeritus), Michel, A. Olson†, K. Olson, Price, Rozenblit, Smith (Emeritus), Sutherland, Vaughan, Warren (Emeritus), Weinstein, Wright (Emeritus), Yaney (Emeritus), Zhang  
Associate Professors: Barkley Brown, Breslow (Emeritus), Cooperman, M. David-Fox, Flack, Grimsted, Landau, Lapin, Majeska (Emeritus), Mayo, Moss, Muncy, Palmié, Ridgway, Rowland, Sicilia, Sumida, Williams, Zilfi  
Assistant Professors: Bradbury, Como, K. David-Fox, Gao, Gordon, Lyons, Mar  
Adjunct: Carr, Papenfuse  
Affiliate: Darden, Moses, Struna  
†Distinguished Scholar Teacher

The Department of History seeks to broaden the student's cultural background through the study of history and to provide preparation for those interested in law, publishing, teaching, journalism, civil service, military, museum work, archival and library work, diplomacy, business school, and graduate study.

Undergraduate advisers assist each major in planning a curriculum to meet his or her personal interests. We encourage students to meet with an adviser, both in the department and in the College of Arts and Humanities, once every semester.

The department sponsors a History Undergraduate Association which majors and other interested students are encouraged to join. It also sponsors Phi Alpha Theta, study-abroad programs, and experiential learning (internships).

### Requirements for Major

Requirements for the History major are 39 hours of history course work distributed as follows: 12 hours in 100-200 level introductory courses selected from at least two general geographical fields of history and including **History 208**; 15 hours in one major area of concentration (see below); nine hours of history in at least two major areas other than the area of concentration; **History 408**. All courses for the major must be completed with a minimum grade of C, and 21 hours of the 39 total hours must be at the junior-senior (300-400) level.

At least one course (three credits), must be taken from an approved list of courses on regions outside both Europe and the U.S. The list may be obtained from the History Undergraduate Adviser's Office.

### I. Introductory Courses

1. The requirement is 12 hours at the 100-200 level taken in at least two geographical fields.
2. **One of these must be History 208.**
3. In considering courses that will fulfill this requirement, students are encouraged to:
  - a. select at least two courses in a sequence
  - b. select at least one course before 1500 and one course after 1500
  - c. sample both regional and topical course offerings. Students will normally take one or more introductory courses within their major area of concentration.

### II. Major Area of Concentration

1. The requirement is 15 hours.
2. Students may choose an area of concentration that is either geographic, chronological, or thematic. Areas include:
  - a. Geographic regions: Latin America, Middle East, Britain and Western Europe, the United States, East Asia, Africa, Eastern Europe and Russia;
  - b. Chronological periods; ancient, medieval, early modern, and modern
  - c. Themes: science and technology, social and cultural, women and gender, African American, Jewish military, religious business, and economic.

### III. Nine Hours of History in at Least Two Areas Outside the Area of Concentration

1. Students are encouraged to select mainly upper-level courses.
2. Students are encouraged to consider regional diversity.

### IV. Capstone

**History 408 will be taken in the senior year and may be inside or outside the area of concentration.**

### V. Supporting Courses Outside History

Nine credits at the 300-400 level in appropriate supporting courses; the courses do not all have to be in the same department. Supporting courses should study some aspect of culture and society as taught by other disciplines. A minimum grade of C is required.

A.P. and I.B. credits are accepted.

## Honors

The purpose of the Honors Program in History is to allow promising undergraduates to develop historical and historiographical skills, in an atmosphere that guarantees personal attention and encourages hard work and excellence. The program is a four-semester, 12-credit sequence that culminates in a senior thesis, a major research paper written under the close supervision of a faculty mentor. The program has two phases. In the junior year, students are introduced to the problems of history and writing at a sophisticated level via two seminars on problems in historiography. In the senior year, students take two supervised courses in the writing of the thesis. The minimum GPA for admission to the History Honors Program is 3.3.

Course Code: HIST

## HORTICULTURE (HORT)

The Horticulture and Agronomy programs have been reorganized into a single major, Natural Resource Sciences (NRSC). See **Natural Resource Sciences** elsewhere in this chapter. (**Note:** Courses formerly offered as HORT and AGRO are now offered as NRSC and PLSC.)

## HUMAN DEVELOPMENT (INSTITUTE FOR CHILD STUDY) (EDHD)

### College of Education

3304 Benjamin Building, (301) 405-2827  
[www.education.umd.edu/EDHD](http://www.education.umd.edu/EDHD)

Chair: Flatter

Assistant Director/Institute for Child Study: Battle

Professors: Alexander†, Byrnes, Fox, Guthrie, Killen, Rubin, Torney-Purta, Wentzel, Wigfield†

Associate Professors: Flatter, Klein, Marcus, Nettles, Robertson-Tchabo  
 Assistant Professors: Azevedo, Cabrera, Druin, Jones-Hardin, Parault, Wang  
 Emeriti: Bennett, Dittman†, Eliot, Fein, Gardner, Goering, Green, Hatfield,  
 Huebner, Hunt, Matteson, Morgan†, Seefeldt, Tyler  
 †Distinguished Scholar Teacher

The Department of Human Development offers: (1) a major in Early Childhood Education; (2) undergraduate courses in human development at the 200, 300, & 400 levels; (3) graduate programs leading to the M.A., M.Ed., Ed.D., and Ph.D. degrees and the A.G.S. certificate; and (4) field experiences and internships to develop competence in applying theory to practice in schools and other settings. A concentration in life span human development and specializations in educational psychology and developmental sciences are available at the doctoral level. Faculty research in areas such as educational psychology, social, physiological, cognitive and moral development, achievement motivation, and early childhood education enhance the instructional program.

Faculty in the Department of Human Development teach courses designed for pre-service and in-service teachers in the College of Education as well as students seeking teaching citations from other departments across campus who will work with children and adolescents in school settings. These courses focus on child and adolescent development, language acquisition, cognition, motivation, and reading. In addition, we teach undergraduate courses that help students meet CORE requirements and other degree requirements.

The Institute for Child Study faculty provide consultant services and staff development programs for pre-school programs, parent groups, court systems, mental health agencies, and other organizations involved with helping relationships. Undergraduates and graduate students may participate in these programs through course work and internships.

## Early Childhood Education

Graduates of the Early Childhood Education program receive a Bachelor of Science degree and meet the requirements for teaching preschool, kindergarten and primary grades.

### Requirements for Major Including Program Options

All Teacher Education Programs have designated pre-professional courses and a specified sequence of professional courses. Before students may enroll in courses identified as part of the professional sequence, they must first gain admission to the College of Education's Teacher Education Program.

## Admission

Application to the Teacher Education Professional Program must be made early in the semester prior to beginning professional courses. Admission procedures and criteria are explained in the College of Education entry in Chapter Six. The Early Childhood program is a Limited Enrollment Program (LEP), which admits students on a space-available basis. In addition to the College of Education selective admission requirements, early childhood majors must meet the following gateway requirements:

- (1) completion of a four-credit CORE laboratory physical science, a four-credit CORE laboratory biological science, Elements of Mathematics (MATH 210), and Elements of Geometry (MATH 211) with a minimum cumulative GPA in these four courses of 2.75
- (2) completion of Exploring Teaching in Early Childhood Education (EDHD 220) with a grade of B or better.

A description of the Early Childhood LEP is included in Chapter 6. Detailed information regarding the gateway requirements is available in the Office of Student Services, Room 1204 Benjamin.

## Advising

Advising is mandatory for all students desiring acceptance into the Teacher Education Program. Students will receive advising through individual advising appointments held during the early registration period. Information regarding the advising appointment schedule will be available each semester in Room 1117J Benjamin. Walk-in hours are also posted each semester.

## Honors and Awards

Early Childhood majors are eligible for the Ordwein Scholarship. Information is available in the Office of Student Services, Room 1204, Benjamin.

## Required Courses

The following courses are required in the program of studies for Early Childhood and may also satisfy the University's general education requirements. See departmental worksheets and advisors for additional information.

PSYC 100 .....	3
Social Science (ANTH, GEOG, GVPT, ECON SOCY).....	3
HIST 156 .....	3
Biological Science w/lab: BSCI.....	4
Physical Science w/lab: ASTR, CHEM, GEOL, PHYS .....	4
EDPL 210 or EDPL 301 .....	3

### Other Pre-Professional Requirements

Math 210 and Math 211 .....	8
Creative Art: One of the following: KNES 181, 182, 183, 421, THET 120, EDCI 301, ARTT 100 or 110, MUSC 155.....	2-3
EDHD 220—Exploring Teaching in EC.....	3
EDHD 210—Foundations of ECE .....	3
EDHD 285—Designing Multimedia Computer Environments for Learners .....	3
EDHD 222—Literature in the Early Childhood Classroom .....	3

### Professional Courses

The Early Childhood Professional Block I starts only in the Fall semester and is a prerequisite to Professional Block II. Professional Block III follows Professional Block II, and is taken in the Fall semester preceding student teaching. An overall grade point average of 2.5 must be maintained after admission to Teacher Education. All pre-professional requirements must be completed with a minimum grade of C before beginning the Early Childhood Professional Blocks. All professional courses must be completed with a minimum grade of C prior to student teaching. See advisor for program planning. Additional information regarding the requirements for Student Teaching is included in the College of Education entry in Chapter Six.

#### Professional Block I: (Fall)

EDHD 415-Social Competence in Young Children .....	3
EDHD 425-Language Development and Reading Acquisition .....	3
EDHD 419A-Human Development and Learning.....	3

#### Professional Block II: (Spring)

EDHD 424-Cultural and Community Perspectives .....	3
EDHD 314-Reading in the EC Classroom-Part I .....	3
EDHD 313-Creative Experiences for the Young Child .....	3
EDHD 419B-Human Development and Learning.....	3
EDSP 470A-Introduction to Special Education .....	3

#### Professional Block III: (Fall)

EDHD 427-Constructing and Integrating the EC Curriculum .....	3
EDHD 323-Children Study Their World .....	2
EDHD 321-The Young Child as Scientist .....	2
EDHD 322-The Young Child as Mathematician .....	3
EDHD 315-Reading in the EC Classroom-Part II .....	3
EDHD 435-Effective Components of EC Classrooms.....	3

#### Professional Block IV: (Spring)

EDHD 432-Student Teaching .....	12
EDCI 464-Assessment of Reading .....	3

Course Code: EDHD

## HUMAN RESOURCE MANAGEMENT

For information, consult the Robert H. Smith School of Business entry in chapter 6.

## JEWISH STUDIES PROGRAM (JWST)

### College of Arts and Humanities

0113 Woods Hall, (301) 405-4975  
[www.umd.edu/jwst](http://www.umd.edu/jwst)

Director: Marsha Rozenblit  
 Professors: Berlin, Rozenblit  
 Associate Professors: Cooperman, Lapin, Manekin  
 Assistant Professors: Jelen, Zakin  
 Instructors: Gonen, Levy

## 124 Journalism

### The Major

The Jewish Studies major provides undergraduates with a framework for organized and interdisciplinary study of the history, philosophy, and literature of the Jews from antiquity to the present. Jewish Studies draws on a vast literature in a number of languages, especially Hebrew and Aramaic, and includes the Bible, the Talmud, and medieval and modern Hebrew literature. Yiddish language and literature comprise an important sub-field.

Departmental advising is mandatory.

### Requirements for Major

Requirements for the Jewish Studies major include the College of Arts and Humanities requirement of 45 upper-level credits completed. The College foreign-language requirement will be automatically fulfilled in the process of taking Hebrew language courses. The undergraduate major requires 48 semester hours (27 hours minimum at 300-400 level) in Jewish Studies. These courses may include courses offered by Jewish Studies or cross-listed by Jewish Studies with the Departments of Asian and East European Languages and Literatures, History, Philosophy, English, Women's Studies, and Comparative Literature.

A minimum grade of C is required in all courses offered toward major requirements. A major in Jewish Studies will normally conform to the following curriculum:

1. Prerequisite: HEBR 111, 112, 211, 212 (or placement exam)
2. Required courses: HEBR 313, 314; JWST 234, 235, and 309; one course in classical Jewish literature (200-level); one upper-level course in Hebrew literature in which the text and/or language of instruction are in Hebrew. (21 credit hours)
3. Electives: 15 credits in Jewish Studies courses. At least nine credits must be at the 300-400 level.
4. Twelve credits of supporting courses in areas outside Jewish Studies such as history, sociology, philosophy, psychology, or literature, including at least six credits at the 300-400 level, to be selected with the approval of a faculty adviser.

### Citation in Jewish Studies

Requirements: 15 credits in Jewish Studies, at least 9 of which must be at the upper level. Students must take 1 course each in Jewish history, literature, and thought, and 2 other courses in Jewish Studies. No more than 3 credits of lower level language can count toward the Citation. No more than 6 credits may be taken at an institution other than UMCP. Students must earn at least a "C" in each course.

### Financial Assistance

The Meyerhoff Center for Jewish Studies [(301) 405-4975] offers scholarships for study in Israel. Applications for scholarships are accepted in early March.

See entries for Department of Asian and East European Languages and Cultures and East Asian Studies certificate elsewhere in this chapter. Students may also pursue a Jewish History concentration through the Department of History.

Course Code: JWST

## JOURNALISM (JOUR)

For information, consult the College of Journalism entry in chapter 6.

## KINESIOLOGY (KNES)

### College of Health and Human Performance

2351 HLHP Building, (301) 405-2450  
[www.hhp.umd.edu/KNES](http://www.hhp.umd.edu/KNES)

Professor and Chair: Clark  
Associate Chair: Phillips  
Professors: Clark, Ennis, Franks, Hagberg, Hurley, Iso-Ahola  
Associate Professors: Andrews, Chen, Hatfield, Jeka, McDaniel, Phillips, Rogers, Rohm-Young, Wrenn  
Assistant Professors: Brown, Contreras-Vidal, Mason, Roth  
Instructors: Brown, Horne, Lindle, Montfort, Scott  
Emeriti: Eyer, Dotson, Hult, Humphrey, Husman, Kelley, Steel

### The Majors

The Department of Kinesiology offers two undergraduate degree programs. Students may choose to major in Physical Education or in Kinesiological Sciences. Brief descriptions of each program follow. Students should obtain a current Student Handbook for the degree program of interest (available in HHP 2351, HHP 2301 and on the web at [www.hhp.umd.edu/KNES](http://www.hhp.umd.edu/KNES)). Both programs require a grade of C or better in all required coursework. Departmental contacts are Mr. Joshua Montfort for Physical Education (301-405-2502, [jm259@umail.umd.edu](mailto:jm259@umail.umd.edu)) or Dr. Marvin Scott (301-405-2480, [ms24@umail.umd.edu](mailto:ms24@umail.umd.edu)) for Kinesiology.

In addition to University general education classes (CORE), the following KNES Core classes are required for all majors (both degree programs):

KNES 287 Sport and American Society  
KNES 293 History of Sport in America  
KNES 300 Biomechanics of Human Motion  
KNES 350 Psychology of Sport  
KNES 360 Exercise Physiology  
KNES 370 Motor Development  
KNES 385 Motor Control and Learning

### Physical Education Major

The Physical Education degree program is designed to lead to Pre-K-12 teacher certification in the State of Maryland. Maryland teaching certificates are reciprocal with most other states. While this program is designed to provide professional preparation for individuals in public school settings, it also provides excellent preparation for those wishing to pursue other professional opportunities in sport, exercise, or physical activity. Also, due to the scientific foundation of the degree program, an appropriate background is established for future graduate work for those who desire to continue their studies in any area involving human movement and sport. Many courses require prerequisites and proper sequencing is very important. Not all courses are offered every semester. All interested students are urged to schedule an advising appointment with the program coordinator before declaring this major. Students should consult the department for updated information.

### Physical Education Degree Requirements

University Core (not included elsewhere*) .....	27-30
KNES Core (KNES 287, 293, 300, 350, 360, 370, 385) .....	22
Pedagogical Sequence .....	25
(KNES 182, 183, 190, 245, 290, 291, 292, 371, 491)	
Supporting courses .....	21
( BSCI 105*, BSCI 201*, BSCI 202, KNES 282, 333, 480)	
College of Education requirements .....	12
(EDPL 301, EDHD 413, EDHD 426, EDCI 463)	
Student Teaching .....	15
(KNES 390, EDCI 485, EDCI 495)	

Minimum total semester hours for this program is 122 credits.

Admission to the College of Education is required upon completion of 45 applicable credits. Students must pass the Praxis I exam and have a GPA established by the College of Education in order to gain admission. Additional information is available from the College of Education.

### Kinesiological Sciences Major

This program offers students the opportunity to study the interdisciplinary body of knowledge related to human physical activity and sport and to pursue specific specializations so that each individual can prepare for a particular career goal within the broad discipline. There is no intent to orient all students toward a particular specialized interest, orientation or career. However, many current students are pursuing careers in medically-related fields (i.e., physical therapy, physician, chiropractor), in the fitness industry (i.e., corporate fitness, personal training, health fitness director) as well as in the sport industry (sport management, sport marketing, events management, equipment sales, athletic director). The program provides a hierarchical approach to the study of human movement. First, a broad core of knowledge is recognized as being necessary foundations to advanced and more specific courses. Secondly, at the "Options" level, students select from approved upper level KNES courses which they believe will provide the knowledge to pursue whatever future goal they set for themselves. To further strengthen specific areas of interest, students should carefully select electives. The program culminates with a senior seminar class in which students write a substantial paper and discuss the implications of research.

## Kinesiological Sciences Degree Requirements

University Core (not included elsewhere*) .....	30
KNES Core (KNES 287, 293, 300, 350, 360, 370, 385) .....	22
Option Courses (all have KNES core prerequisites .....	12
(See departmental Bulletin Board, Handbook or web page)	
Other required courses .....	18
(BSCI 105*, BSCI 201*, BSCI 202, statistics, KNES 497)	
Physical Activities Courses (see Handbook or web page) .....	8
Electives (approximately) .....	30

Minimum total semester hours for program = 120 credits, including the general education (CORE) program.

## Advising

Advising is mandatory for Physical Education majors and strongly recommended (but not mandatory) for Kinesiological Sciences majors. Students in both majors are encouraged to join the departmental listserv (group electronic information) for weekly departmental and campus updates and internship/job information. Instructions for joining the listserv are available at the Main Office (HHP 2351). Students should also periodically check the Bulletin Boards near HHP 2335 for updated information. Kinesiological Sciences majors with greater than 90 credits should meet with an advisor to review and sign the senior audit.

Advisors are not assigned, although certain advisors handle issues related to policy exceptions, academic difficulties, change of major, athletes, and other special cases. Advising appointments are made through the Main Office (301-405-2450). Drop-in hours are available during non-peak registration times. Advisors can assist with registration procedures, program updates, University resources, career guidance, and related issues. Students are strongly encouraged to closely follow the program sheets that outline the order in which courses should be taken to allow proper and timely progression through the degree programs.

## Honors Program

The departmental Honors Program complements and extends the University Honors Program, although the admission to the University program is not required to be admitted to the departmental program. The departmental Honors Program provides junior and senior students with opportunities to engage in extended study, research and discussions with faculty. The program requires 18 credits of Honors versions of courses and a thesis, which will be defended before a faculty committee. Applicants must have a 3.5 overall GPA in a minimum of 45 credits and a 3.5 GPA in at least 9 credits from the Kinesiology Core. The faculty Honors Committee also considers leadership, motivation and maturity in the admission decision. Qualified students typically apply in the spring semester of the sophomore year. To remain in the program after admitted, students must maintain a 3.5 GPA. Students may graduate with high honors by completing a thesis rated as outstanding and earning a cumulative GPA of 3.7 or higher. Inquires about the program should be directed to Dr. Don Franks, Honors Program Coordinator, at 301-405-2357 or bf60@umail.umd.edu.

Course Code: KNES

## LANDSCAPE ARCHITECTURE (LARC)

### College of Agriculture and Natural Resources

2139 Plant Sciences Building, (301) 405-4359  
js337@umail.umd.edu, md35@umail.umd.edu  
[www.larch.umd.edu/](http://www.larch.umd.edu/)

Professor and Chair: R. Weismiller  
Associate Professor and Coordinator: J.B. Sullivan  
Associate Professor: M. Hill  
Assistant Professors: S. Chang, D. Myers  
Instructor: D. Nola

## The Major

The Department of Natural Resource Sciences and Landscape Architecture offers three undergraduate majors. Two lead to the Bachelor of Science (B.S.) degree; one in Natural Resource Sciences and the other in General Agriculture Sciences. The third major leads to a Bachelor of Landscape Architecture (B.L.A.) degree. For additional information on General Agriculture Sciences and Natural Resource Sciences, see the entry for those programs elsewhere in this chapter.

The landscape architecture curriculum is a four-year professional program. The program is primarily a site-based design discipline that also deals with regional and larger-scale environmental issues. The curriculum, a studio-based design program, integrates natural and social factor analysis into the design process. Digital design studios allow the integration of computer-aided design with fundamental design and drawing skills.

**Admission:** Landscape Architecture is a limited-enrollment program (LEP). See Chapter 1 of the Undergraduate Catalog for general limited-enrollment program admission policies. For further information contact the College of Agriculture and Natural Resources at (301) 314-8375.

**Freshman Admission:** The program's goal is to have the greater proportion of program majors admitted as freshmen. Most entering freshmen will gain admission to the landscape architecture program directly from high school, as space permits. Early application is encouraged to ensure the best possible chance for admission.

**Transfer Admission:** Admission of transfer students is limited by space considerations: Students presenting an acceptable graphic portfolio, evaluated by the landscape architecture faculty, may be exempted from one or both of the first year studios. Landscape architecture faculty will evaluate all other LARC-equivalent courses transferred from another institution.

**The Academic Review:** All students will be subjected to an Academic Review after they have completed the first three design studio courses (or their equivalent) in the Landscape Architecture curriculum. To meet the provisions of the review, students must complete: (1) MATH 115 with a minimum grade of C, (2) LARC 120 and 160 with a minimum grade of B, and LARC 140 and 141 with a minimum grade of C, (3) attain a successful review of a portfolio (a minimum of 80 points out of a possible 100) by the landscape architecture faculty to assess graphic and design skills, and (4) attain an overall GPA of at least 2.40. Students who do not meet these requirements will not be allowed to continue in the landscape architecture LEP and will be required to accept another major.

### Other Policies Which Determine a Student's Retention in the Landscape Architecture Program:

- A student can only repeat one of the five gateway courses of the Academic Review Course Requirements (LARC 120, 140, 141, 160 and MATH 115). That particular course can only be repeated once.
- A grade of 'W' (Withdrawn) in a course is counted as an attempt.
- A student who does not meet the Academic Review requirements will be dismissed from the Program.
- A student who is dismissed from the Program will not be readmitted to the Landscape Architecture LEP.

**Appeals:** Students who are unsuccessful in gaining admission to the Landscape Architecture LEP and believe they have extenuating or special circumstances, which should be considered, may appeal in writing to the Office of Undergraduate Admissions. The student will be notified in writing of the appeal decision.

Students in the Landscape Architecture LEP who do not pass the Academic Review but believe they have special circumstances that should be considered should appeal directly to the Coordinator of the Landscape Architecture program.

**BLA Degree Requirements:** The courses and credit hours that define the curriculum leading to the degree of Bachelor of Landscape Architecture (BLA) are described in the next section. The curriculum includes required courses for the major as well as additional CORE program requirements and electives. Following the successful Academic Review and acceptance into the LARC Program, students must have an overall average of a C (2.0) to be eligible for the BLA degree. Students must also have grades of C or better in all required courses with the LARC designation.

## Curriculum in Landscape Architecture

### Landscape Architecture Degree (B.L.A.)

	<b>Semester Credit Hours</b>
ENGL 393—Technical Writing .....	3
GEOG 340—Geomorphology <b>or</b>	
GEOG 372—Remote Sensing <b>or</b>	
NRSC 444—Remote Sensing: Natural Resources .....	3
LARC 120—Digital Fundamentals Studio .....	2
LARC 140—Graphic Fundamentals Studio .....	4
LARC 141—Design Fundamentals Studio .....	4
LARC 160—Introduction to Landscape Architecture .....	3
LARC 221—Digital Design Tools .....	3
LARC 240—Graphic Communication and Design Studio .....	4
LARC 263—History of Landscape Architecture... ..	3
LARC 265—Site Analysis and Ecological Principles .....	3
LARC 320—Principles of Site Engineering .....	3
LARC 321—Landscape Structures & Materials .....	3
LARC 340—Site Planning and Design Studio .....	5
LARC 341—Regional Design and GIS Studio .....	5
LARC 389—Internship in Landscape Architecture .....	3
LARC 420—Professional Practice .....	3
LARC 440—Urban Design Studio .....	5
LARC 450—Environmental Resources <b>or</b>	
LARC 451—Sustainable Communities .....	3
LARC 470—Landscape Architecture Seminar.....	3
LARC 471—Capstone/Community Design Studio .....	5
MATH 115—Pre-calculus .....	3
NRSC 200—Fundamentals of Soil Science .....	4
PLSC 100—Introduction to Horticulture .....	4
PLSC 253—Woody Plant Materials I. ....	3
PLSC 254—Woody Plant Materials II .....	3
Total Major Requirements .....	87
Additional CORE Program requirements .....	24
Electives .....	9
<b>Total .....</b>	<b>120</b>

### Internship Opportunities

Internships are available at nearby federal, state and county agencies as well as in private landscape architecture practices.

### Student Organizations

The Student Chapter of the American Society of Landscape Architects (ASLA) provides students with opportunities to get involved with on-campus activities. The club is sponsored by ASLA.

### Scholarships

Several scholarships and awards are available to Landscape Architecture students. Contact the Associate Dean's office at (301) 405-2078 for additional information.

Course Code: LARC

## LINGUISTICS (LING)

### College of Arts and Humanities

1401 Marie Mount Hall, (301) 405-7002

Professor and Chair: Crain

Professors: Hornstein, Lightfoot

Associate Professors: Lombardi, Pietroski, Thornton, Uriagereka, Weinberg

Assistant Professors: Phillips, Poepfel, Resnik

Affiliate: Berndt, Brent, Burzio, Gasarch, Smolensky, Zanuttini, Zsiga

### The Major

The Linguistics Department offers courses on many aspects of language study and an interdisciplinary major leading to a Bachelor of Arts. Language is basic to many human activities and linguistics relates to many other disciplines which include work on language.

Work on language has provided one of the main research probes in philosophy and psychology for most of the 20th century. It has taken on a new momentum in the last 30 years and language research has proven to be a fruitful means to cast light on the nature of the human mind and on general cognitive capacity. Several courses focus on a research program which takes as a central question: How do children master their native language? Children hear many styles of speech, variable pronunciations, and incomplete expressions, but, despite this flux of experience, they come to speak and understand speech effortlessly, instantaneously, and subconsciously. Research aims to discover how this happens, how a person's linguistic capacity is represented in the mind, and what the genetic basis for it is. Students learn how various kinds of data can be brought to bear on their central question and how that question influences the shape of technical analyses.

The major in Linguistics is designed for students who are primarily interested in human language *per se*, or in describing particular languages in a systematic and psychologically plausible way, or in using language as a tool to reveal some aspect of human mental capacities. Such a major provides useful preparation for professional programs in foreign languages, language teaching, communication, psychology, speech pathology, and artificial intelligence (and thus in computer work).

Departmental advising is mandatory for second-semester sophomores and seniors.

### Requirements for Major

The major in Linguistics is 42 credits. The major consists of a "Core" of 18 credits plus 24 additional credits required for one of two tracks, "Linguistic Theory and a Language" or "Grammars and Cognition".

The double major is 27 credits - the core of 18 credits plus 3 upper level electives (9 credits). The double degree requires all 42 credits needed for the major.

(All linguistics courses are 3 credits each)

#### The Core (18 credits)

LING 200—Introductory Linguistics

LING 240—Language and Mind

LING 311—Syntax I (Fall only)

LING 312—Syntax II (Spring only)

LING 321—Phonology I (Fall only)

LING 322—Phonology II (Spring only)

#### Grammar and Cognition Tracks

PHIL 170 or 173 or 271

PHIL 360—Philosophy of Language

PSYC 100—Introduction to Psychology

PSYC 341—Introduction to Memory and Cognition

Two 300/400 level LING electives

Two electives from LING, PSYC, HESP, PHIL, or CMSC, chosen in consultation with the advisor.

#### Linguistic Theory and a Language Track

Six courses of study (or 18 credits total) in one language; one of these courses should be in the history or structure of the language, if offered. Two 300/400 level LING electives.

When possible, the language of specialization should be the same as the one used to satisfy the College of Arts and Humanities' foreign language requirement. The specialization normally includes those courses that make up the designated requirement for a major in the chosen language. Special provision may be made for students who are native speakers of a language other than English and wish to conduct analytical work on the grammar of that language. A student may also study grammatical theory and English; the 18-hour concentration in English consists of courses in the history and structure of English to be selected in consultation with the student's Linguistics adviser.

For a double major, students need 27 credits in Linguistics, which normally include the LING courses for one of the two specializations.

#### Citation in Linguistics

15 credit hours. LING 200, 240, 321, 311 and one course from approved list of courses. Students who fulfill Citation requirements will receive a Citation on the official transcript. Please contact the Director of Undergraduate Studies for more information.

Course Code: LING

## LOGISTICS, BUSINESS, AND PUBLIC POLICY

For information, consult the Robert H. Smith School of Business entry in chapter 6.

## MARKETING

For information, consult the Robert H. Smith School of Business entry in chapter 6.

## MATERIALS SCIENCE AND ENGINEERING (ENMA, ENNU)

### A. James Clark School of Engineering

2135 Chemical and Nuclear Engineering Building, (301) 405-5208  
[www.mne.umd.edu](http://www.mne.umd.edu)

Chair: Christou

Professors: Armstrong\* (Emeritus), Arsenault (Emeritus), Christou, Dieter\* (emeritus), Orhlein, Ramesh, Roytburd, Rubloff, Salamanca-Riba, Smith (emeritus), Wuttig, Yeh

Associate Professors: Al-Sheikhly, Ankem, Briber (associate chair), Lloyd, Martinez-Miranda

Assistant Professors: Kidder, Phaneuf, Takeuchi, Wilson

Adjunct: Lawn

Affiliate Associate Professor: Kofinas

\*Member of Mechanical Engineering Department

### The Major

The development, production and use of novel materials has become a major issue in all fields of engineering. Materials which are strong and light at the same time are needed for space structures; faster electro-optical switching materials will result in improved mass communications; and stronger high temperature plastics would improve the efficiency of transportation systems. The mission of the materials science and engineering program is to provide the student with an interdisciplinary science-based education to understand the structure and resulting properties of metallic, ceramic, polymeric, and electronic materials. Students will gain the ability to solve problems in the design, processing and use of advanced materials. Students will have the opportunity to work with faculty and industry on complex problems through projects, internships, and research and co-op experiences. A wide variety of careers are open to graduates of this program ranging from production and quality control in the traditional materials industries to the molecular construction of electronic materials in ultra-clean environments, and to the applications of materials in electronic packages. The application of materials to solve environmental, energy, and reliability problems are also career options.

Students may major in the Bachelor of Science in Materials Science and Engineering Program or may use Materials Engineering as a field of concentration in the Bachelor of Science Engineering Program.

### Requirements for Major

Requirements for the Materials Science and Engineering major include thorough preparation in mathematics, chemistry, physics, and engineering science as well as the required University general education (CORE) requirements. All students will be required to select an area of specialization, an upper-class science elective, and two technical electives. A minimum of 123 credits is required for a bachelor's degree. A sample program follows:

	Semester	
	I	II
<b>Freshman Year</b>		
CORE Program Requirements .....		6
ENES 100—Introduction to Engineering Design .....	3	
ENMA 181*—Introduction to Engineered Materials, Seminar ...	1	
CHEM 135—General Chemistry for Engineers .....	3	
CHEM 136—Chemistry Lab .....	1	
MATH 140—Calculus I .....	4	
MATH 141—Calculus II .....		4
ENGL 101—Introduction to Writing .....	3	
ENES 102—Statics. ....	3	
PHYS 161—General Physics I .....	3	
<b>Total .....</b>	<b>15</b>	<b>16</b>

\*Recommended, but not required.

### Sophomore Year

Core Program Requirements .....	3	3
MATH 241—Calculus III .....	4	
MATH 246—Differential Equations for Scientists and Engr .....	3	
PHYS 262-263—General Physics .....	4	4
ENES 230—Introduction to Materials and their Applications. ...	3	
ENEE 204—Basic Circuit Theory .....	3	
CHEM 233—Organic Chem, or CHEM 481*, Phys. Chem. I .....	4 or 3	
<b>Total .....</b>	<b>14</b>	<b>17,16</b>

\*Chem 233 is required for students specializing in organic materials

### Junior Year

CORE Program Requirements .....	3	3
ENMA 310—Materials Laboratory I, Structural Characterization 3		
ENMA 311—Materials Laboratory II: Electromagnetic Properties .....	3	
ENMA 362—Mechanical Properties .....	4	
ENMA 460—Physics of Solid Materials .....	3	
ENMA 461—Thermodynamics of Materials .....	3	
ENMA 465—Microprocessing of Materials .....	3	
Specialization Electives .....	3	3
<b>Total .....</b>	<b>16</b>	<b>15</b>

### Senior Year

CORE Program Requirements .....	3	3
ENMA 463—Macroprocessing of Materials .....	3	
ENMA 471—Kinetics, Diffusion and Phase Transformations ...	3	
ENMA 490—Materials Design .....	3	
Specialization Electives .....	3	3
Technical Electives .....	6	
ENRE 445—Principles of Quality and Reliability. ....	3	
Upper-level science elective .....	3	
<b>Total .....</b>	<b>18</b>	<b>15</b>

**Minimum Degree Credits:** 123 or 124 credits and the fulfillment of all department, school, and university requirements.

Four suggested specialization areas with example classes follow. Students are expected to take four specialization electives in one particular area during their junior and senior years after consulting with their adviser.

**Materials Science:** ENMA 464—Environmental Effects; ENMA 420—Intermediate Ceramics; ENMA 489C—Electronic Packaging Materials; ENMA 495—Polymeric Materials; ENMA 481—Electronic Materials; ENMA 499—Laboratory Projects

**Applications of Materials and Manufacturing:** ENMA 472—Technology and design of Engineering Materials; ENMA 489A—Design of Composites; ENMA 489L—Manufacturing Ceramics; ENMA 489R—Manufacturing Polymers; ENME 400—Machine Design; ENME 465—Fracture Mechanics; ENAE 424—Design and Manufacturing of Composites and Prototypes; ENMA 499—Laboratory Projects

**Organic Materials:** ENMA 495—Polymeric Materials; ENMA 496—Processing of Polymers; ENCH 490—Introduction to Polymer Chemistry; ENMA 489R—Manufacturing Polymers; ENCH 494—Polymer Technology Laboratory; ENMA 499—Laboratory Projects

**Microelectric Materials:** ENMA 481—Introduction to Electronic and Magnetic Materials; ENMA 489C—Electronic Packaging Materials; ENEE 302—Digital Circuits; ENEE 460—Control Systems; ENEE 480—Fundamentals of Solid State Electronics.

## 128 Mathematics

### Admission

All Materials Science and Engineering students must meet admission, progress, and retention standards of the A. James Clark School of Engineering.

### Advising

Students choosing materials science and engineering as their major or materials engineering as their primary or secondary field of concentration should contact Dr. Kathleen Hart, the Undergraduate Programs Coordinator, Room 1113, Chemical and Nuclear Engineering Building, at (301) 405-5989. Dr. Hart can set up appointments with Professors Lloyd, Martinez-Miranda, and Wilson, the Undergraduate Advisors. Any questions about the program should be directed to Dr. Ramesh Ramamoorthy, Undergraduate Studies Director.

### Co-op Program

The Materials Science and Engineering program works within the A. James Clark School of Engineering Cooperative Engineering education Program. For details, see the A. James Clark School of Engineering entry in chapter 6.

### Financial Assistance

Financial Aid based upon need is available through the Office of student Financial Aid. Faculty Merit Scholarships are offered to outstanding students by the department. Other scholarships are available through the A. James Clark School of Engineering. The department offers opportunities for research internships with faculty.

### Honors and Awards

Each of the large number of professional-materials-oriented societies such as the metallurgical and ceramic societies sponsor awards to recognize outstanding scholarship and undergraduate research. All students enrolled in the materials engineering program are encouraged to select a faculty adviser who in their junior and senior years will guide them towards nomination for these awards. Awards from MRS, TMS Societies are available.

Student organization: There is an active student chapter of The Minerals, Metals & Materials Society (TMS).

Course Code: ENMA

### Nuclear Engineering Program (ENNU)

2309 Chemical and Nuclear Engineering Building, (301) 405-5832  
[www.mne.umd.edu](http://www.mne.umd.edu)

Professor and Chair: Christou

Use of Nuclear Engineering as a field of concentration in the Bachelor of Science in Engineering program has been suspended for the time being.

## MATHEMATICS (MATH)

### College of Computer, Mathematical and Physical Sciences

1117 Mathematics Building, Undergraduate Office, (301) 405-5053  
[www.math.umd.edu/](http://www.math.umd.edu/)

Professor and Chair: Fitzpatrick

Professors: J. Adams, W. Adams, Antman††, Benedetto†, Berenstein, Boyle, Brin, Chu, Cohen, J. Cooper, Ellis, Fey\*\*, Freidlin††, Glaz, Goldman, Green, Greenberg, Grillakis, Grove, Gulick, Halperin!!!!, Hamilton, Healy, Herb, Jakobson, Johnson, Kagan, Kedem, King, Kirwan!!!!, Kudla, Kueker, Laskowski, Lay†, Levermore\*\*\*!, Lipsman!!!, Lopez-Escobar, Liu\*\*\*, Machedon, Millson, Nochetto, Novikov††, Osborn, Pego, Rosenberg, Rudolph†, Schafer, Schwartz, Slud, Sweet, Tadmore\*\*\*!, Washington, Wolfe, Wolpert!!!, Yang, Yorke††\*\*\*

Associate Professors: Berg, Dancis, Dolgopyat, Helzer, Hunt\*\*\*, Lee, Smith, von Petersdorff, Warner, Winkelkemper, Wu

Assistant Professors: Dolzmann, B., Haines, Li, Ramachandran, Trivisa, Yu  
Professors Emeriti: Alexander, Auslander, Babuska††, Brace, Correl,

Edmundson, Ehrlich, Goldberg, Goldhaber, Good, Heins, Horvath, Hubbard, Hummel, Kellogg, Kirwan, Kleppner, Lehner, Markley, Neri, Oliver, Owings, Syski, Zedek

Associate Professors Emeriti: Sather, Schneider

Affiliate Professors: O'Leary, Stewart, Young

Adjunct Professor: Rinzel

†Distinguished Scholar Teacher

††Distinguished University Professor

\*\*Joint Appointment: Department of Curriculum and Instruction

\*\*\*Joint Appointment: IPST

!Director, AMSC

!!Director, CSC AMM

!!!Associate Dean, CMPS

!!!!Dean, CMPS

!!!!!!Chancellor, USM

The program in mathematics leads to a degree of Bachelor of Science in mathematics and offers students training in preparation for graduate work, teaching, and positions in government or industry. Mathematical training is integrated with computer use in several courses. Because a strong mathematical background is important in several fields, over a third of UMCP mathematics majors are double majors. Additional information on these topics and mathematics is available from the department website.

### Requirements for Major

There are three tracks for the major, the traditional track the secondary education track, and the statistics track. The secondary education track is for students seeking to become certified to teach mathematics at the secondary level. Each mathematics major must complete each required course with a grade of C or better.

### TRADITIONAL TRACK

#### Major Requirements:

1. The introductory sequence MATH 140,141,240, 241 or the honors sequence MATH 350-351. Completion of MATH 340 satisfies the requirement for MATH 241; completion of MATH 340-341 satisfies the requirement for MATH 240-241.
2. One of the courses MATH 246, 341, 414, 415, 436, 462.
3. Eight MATH/AMSC/STAT courses at the 400-level or higher, at least four of which are taken at College Park. The eight courses must include:
  - (a) At least one course from MATH 401, 403, 405.
  - (b) One course from AMSC 460,466.
  - (c) MATH 410 (completion of MATH 350-351 exempts the student from this requirement and (e) below; students receive credit for two 400-level courses.)  
Students are strongly encouraged to complete MATH 310 prior to attempting MATH 410.
  - (d) A one-year sequence which develops a particular area of mathematics in depth, chosen from the following list:
    - (i) MATH 410-411
    - (ii) MATH 410-412
    - (iii) MATH 403-404
    - (iv) MATH 403-405
    - (v) MATH 446-447
    - (vi) STAT 410-420
  - (e) The remaining 400-level MATH/AMSC/STAT courses are electives, but cannot include any of: MATH 400, 461, 478, or STAT 464. Also, students with a strong interest in applied mathematics may, with the approval of the Undergraduate Office, substitute two courses (with strong mathematics content) from outside the Mathematics Department for one upper-level elective course.
4. One course from CMSC 106, 114 or ENEE 114. Students may be exempt from this requirement if he or she can demonstrate adequate programming knowledge from prior course work experience.
5. One of the following supporting three-course sequences. These are intended to broaden the student's mathematical experience. Other sequences might be approved by the Undergraduate Office but they would have to make use of mathematical ideas, comparable to the sequences on this list.
  - (a) (i) PHYS 161-262-263.
  - (ii) PHYS 171-272-273
  - (iii) PHYS 141-142, and an upper-level physics course approved by the Mathematics Department

- (b) ENES 102, PHYS 161, ENES 220
- (c) (i) CMSC 114-214 and one of CMSC 311, 330  
(ii) CMSC 114-250-351
- (d) CHEM 103-113, and one of CHEM 227, 233
- (e) ECON 200-201 (previously ECON 201-203), and one of ECON 305 or 306
- (f) BMGT 220-221-340.

## SECONDARY EDUCATION TRACK

### Major Requirements:

1. The introductory sequence MATH 140,141,240, 241 or the honors sequence MATH 350-351. Completion of MATH 340 satisfies the requirement for MATH 241; completion of MATH 340-341 satisfies the requirement for MATH 240-241.
2. One of the courses MATH 246, 341, 401, 420, 452, 462 or AMSC 460 or 466.
3. Seven MATH/AMSC/STAT courses at the 400-level or higher, at least four of which are taken at College Park. The seven courses must include:
  - (a) MATH 410 (completion of MATH 350-351 exempts the student from this requirement; students receive credit for two 400-level courses.) Students are strongly encouraged to complete MATH 310 prior to attempting MATH 410.
  - (b) MATH 402 or MATH 403
  - (c) MATH 430
  - (d) STAT 400 or STAT 410
  - (e) At least one course from MATH 406, 445, 446, 447, 450, 456 or 475.

The remaining 400-level MATH/AMSC/STAT courses are electives, but cannot include an/7 Tw MATH 400, 461, 478, or STAT 464.

4. One course from CMSC 106,114 or ENEE 114. Student may be exempt from this requirement if he or she can demonstrate adequate programming knowledge from prior course or work experience.
5. EDCI 450 and 451.
6. One of the following supporting two course sequences. These are intended to broaden the student's mathematical experience.
  - (a) CHEM 103 and 104
  - (b) CHEM 103 and 113
  - (c) PHYS 221 and 222
  - (d) PHYS 161 and 262
  - (e) PHYS 141 and 142
  - (f) BSCI 105 and 106
  - (g) ASTR 200 and a second 3-credit ASTR course, excluding ASTR 100, 101, 110, and 111.
  - (h) METO 200 and 201, and an/7400 level METO course.
  - (i) GEOL 100 and 110, and one of GEOL 322 or GEOL 341.

The student-teaching pair EDCI 450-451 is 15 credits and has further prerequisites in the College of Education. In order to take these courses the student must be admitted into the College of Education. A student in the secondary education track of the mathematics major would normally be expected to receive a double major in Mathematics and Mathematics Education.

## STATISTICS TRACK

### Major Requirements:

1. The introductory sequence MATH 140,141,240, 241 or the honors sequence MATH 350-351. Completion of MATH 340 satisfies the requirement for MATH 241; completion of MATH 340-341 satisfies the requirement for MATH 240-241.
2. One course from MATH 246, 341 and 414.
3. Eight additional courses, at least four of which must be taken at College Park. The eight courses are prescribed as follows:
  - (a) One course from MATH 410 and 350
  - (b) One course from AMSC 460 and 466
  - (c) One course from MATH 401 and 405
  - (d) STAT 410
  - (e) One course from STAT 401 and 420
  - (f) STAT 430
  - (g) Two additional courses from the following list:
    - (i) An/7400-level or higher STAT courses except STAT 464
    - (ii) MATH 351, 411, 412, 414, 420, 464
    - (iii) AMSC 477
    - (iv) BIOM 402
4. One course from CMSC 106, 114 or ENEE 114. Student may be exempt from this requirement if he or she can demonstrate adequate programming knowledge from prior course or work experience.

5. One of the three-course supporting sequences listed in the "Traditional Track" above (part 4).

## AREAS OF STUDY

Within the Department of Mathematics there are a number of identifiable areas which students can pursue to suit their own goals and interests. They are briefly described below. Note that they do overlap and that students need not confine themselves to one of them.

1. Pure mathematics: the courses which clearly belong in this area are: MATH 402, 403, 404, 405, 406, 410, 411, 414, 415, 417, 430, 432, 436, 437, 445, 446, 447, 452, STAT 410, 411, 420. Students preparing for graduate school in mathematics should include MATH 403, 405, 410 and 411 in their programs. MATH 463 (or 660) and MATH 432 (or 730) are also desirable. Other courses from the above list and graduate courses are also appropriate.
2. Secondary teaching: When selecting the seven courses for the Secondary Education Track, students are encouraged to choose the following as they are required for certification to teach mathematics at the secondary level: MATH 402 or 403, MATH 430, and STAT 400. The following additional courses are particularly suited for students preparing to teach: MATH 401, MATH 406, MATH 445, and MATH 475.

EDHD 413, EDHD 426, EDPL 301, EDCI 463, EDCI 350, EDCI 355, EDCI 457, EDCI 450 and EDCI 451 are required for certification. Before registering for the EDCI 350, EDCI 355, EDCI 457, EDCI 450, or EDCI 451 courses, students must apply for and be admitted to the College of Education's Secondary Education Program. For more information, see the College of Education website: [www.education.umd.edu/studentinfo](http://www.education.umd.edu/studentinfo).

3. Statistics: For a student with a Bachelor's degree seeking work requiring some statistical background, the minimal program is STAT 400-401. To work primarily as a statistician, one should combine STAT 400-401 with STAT 430 and at least one more statistics course, most suitably, STAT 440 or STAT 450. A stronger sequence is STAT 410, 420, 430. This offers a better understanding and wider knowledge of statistics and is a general purpose program (i.e., does not specify one area of application). For economics applications STAT 400, 401, 430, 440, 450, and AMSC 477 should be considered. For operations research AMSC 477 and/or STAT 411 should be added or perhaps substituted for STAT 450. To prepare for graduate work, STAT 410 and 420 give the best background, with STAT 405, 411, 430, 440, 450 added at some later stage.
4. Computational mathematics: there are a number of math courses which emphasize the computational aspects of mathematics including the use of the computer. They are AMSC 460, 466, MATH 431, 450, 456, 475 and STAT 430. Students interested in this area should take CMSC 114, 214 as early as possible, and CMSC 420, 211 are also suggested.
5. Applied mathematics: the courses which lead most rapidly to applications are the courses listed above in 3 and 4 and MATH 401, 412, 414, 415, 420, 431, 436, 462, 463, 464, and MATH/AMSC 420 and 472. A student interested in applied mathematics should obtain, in addition to a solid training in mathematics, a good knowledge of at least one area in which mathematics is currently being applied. Concentration in this area is good preparation for employment in government and industry or for graduate study in applied mathematics.

## Advising

Advising for math majors is mandatory. Students are required to sign up for an advising appointment at the math undergraduate office window (1117 Mathematics Building), beginning the week before preregistration.

## Honors

The Mathematics Honors Program is designed for students showing exceptional ability and interest in mathematics. Its aim is to give a student the best possible mathematics education. Participants are selected by the Departmental Honors Committee during the first semester of their junior year. A precise statement of the requirements may be found at [www.math.umd.edu/undergraduate/opportunities](http://www.math.umd.edu/undergraduate/opportunities)

## 130 Mathematical Statistics Program

The department also offers a special department honors sequence MATH 340-341 for promising freshmen with a strong mathematical background (including calculus). Enrollment in the sequence is normally by invitation but any interested student may apply to the Mathematics Department for admission. Participants in the University Honors Program may also enroll in special honors sections of the lower-level mathematics courses (MATH 140H, 141H, 240H, 241H, 246H). Students in Math 340-341 and the special honors sections need not be math majors.

The department has in the past also offered an even more challenging honors sequence for freshmen, MATH 350-351 (previously MATH 250-251). This sequence covered MATH 410-411, MATH 240 and MATH 241 with enrichment.

The mathematics departmental honors sequence and the University Honors Program are distinct, and enrollment in one does not imply acceptance in the other.

### Combined B.S./M.A. Program in Mathematics

The Department of Mathematics offers a combined B.S./M.A. degree program for students with exceptional ability and interest in mathematics. Students enrolled in the Combined Degree Program may count up to 9 credits of coursework taken for their undergraduate degree toward the M.A. degree as well. For further information, please consult the Mathematics Department's Web Page: [www.math.umd.edu/undergraduate/majors](http://www.math.umd.edu/undergraduate/majors)

### Citations

The Department of Mathematics offers Citations in the following areas:

- Actuarial Mathematics
- Applied Mathematical Modeling
- Statistics
- Discrete Mathematics

A Citation offers a structured program of study outside a student's major. A student who completes a Citation program (15-17 credits) will receive a certificate, and the accomplishment will be noted on the student's transcript. See [www.math.umd.edu/undergrad/citations.html](http://www.math.umd.edu/undergrad/citations.html) for detailed information.

### Awards

**Aaron Strauss Scholarships.** Up to two are awarded each year to outstanding junior math majors. The recipient receives full remission of (in-state) tuition and fees. Applications may be obtained early in the spring semester from the Mathematics Undergraduate Office, 1117 Mathematics Building.

**Aziz Mathematics Scholarship:** A monetary award is made on the basis of mathematical excellence.

**Carol Karp Award:** A monetary award is made to a senior math major for an outstanding achievement in logic.

**Edgar Krahn Scholarship:** A monetary award is made on the basis of performance in the Maryland High School Mathematics Competition.

**Higginbotham Prize:** A monetary award is made to an outstanding junior math major in the spring.

**Milton Abromowitz Award:** A monetary award is made to an outstanding junior or senior math major in the spring.

**Outstanding Senior Award:** A monetary award is made to the outstanding graduating math major.

**Secondary Education-Mathematics Scholarship:** Up to two are awarded in the spring to Secondary Education-Mathematics double majors.

For further information on these and other awards, consult [www.math.umd.edu/undergraduate/opportunities](http://www.math.umd.edu/undergraduate/opportunities)

### Placement in Mathematics Courses

The Department of Mathematics has a large offering to accommodate a great variety of backgrounds, interests, and abilities. The department permits students to take any course for which they have the appropriate background, regardless of formal course work. For example, students with a high school

calculus course may be permitted to begin in the middle of the calculus sequence even if they do not have advanced standing. Students may obtain undergraduate credit for mathematics courses in any of the following ways: passing the appropriate CEEB Advanced Placement Examination, passing standardized CLEP examinations, and through the department's Credit-by-Examination. Students are urged to consult with advisers from the Department of Mathematics to assist with proper placements.

### Statistics and Probability and Applied Mathematics

Courses in statistics and probability and applied mathematics are offered by the Department of Mathematics. These courses are open to non-majors as well as majors, and carry credit in mathematics. Students wishing to concentrate in the above may do so by choosing an appropriate program under the Department of Mathematics.

## MATHEMATICAL STATISTICS PROGRAM

### College of Computer, Mathematical and Physical Sciences

1105 Mathematics, (301) 405-5061

[www.math.umd.edu/stat](http://www.math.umd.edu/stat)

Director: Kedem

Professors: Freidlin, Kagan, Kedem, Liu\*\*\*, Slud, Yang

Associate Professors: Lee, Smith

Professor Emeritus: Syski

\*\*\*Joint Appointment: IPST

The Mathematical Statistics Program is a graduate program for students concentrating in the study of Statistics, Probability and their application in real world problems. An undergraduate program emphasizing Statistics is available to majors in Mathematics, and undergraduate citations in Statistics and in Actuarial Mathematics are also available. All STAT courses carry credit in Mathematics.

Course code: STAT

## MEASUREMENT, STATISTICS AND EVALUATION (EDMS)

### College of Education

1230 Benjamin Building, (301) 405-3624

[www.education.umd.edu/EDMS](http://www.education.umd.edu/EDMS)

Professor and Chair: Lissitz

Professors: Dayton, Macready, Mislavy, Stunkard (Emeritus)

Associate Professors: Hancock, Schafer (Emeritus)

Assistant Professors: Hendrickson, Roberts

Adjunct Professor: Peng

Affiliated Professor: Rudner

Affiliated Associate Professor: Von Secker

Affiliated Assistant Professor: Fein

### For Advanced Undergraduates and Graduates

The Department of Measurement, Statistics and Evaluation in the College of Education offers a 5th Year MA program for undergraduates interested in quantitative methods. The purpose of this program is to allow highly motivated undergraduates the opportunity to develop their skills in quantitative methods. Students complete a BA (or BS) in their chosen major area along with an MA in Measurement, Statistics and Evaluation in just five years.

The Department of Measurement, Statistics and Evaluation offers courses in classroom management, applied statistics, and computer-based simulation (Monte Carlo method) for undergraduates. These courses provide a foundation in methods that are very useful for most career choices. The department offers programs at the master's and doctoral levels for persons with quantitative interests from a variety of social science and professional backgrounds. In addition, a doctoral minor is offered for students majoring in other areas. The doctoral major is intended primarily to produce individuals qualified to teach courses at the college level in measurement, applied statistics and evaluation, generate original research and serve as specialists in measurement, applied statistics or evaluation in school systems, industry or government. The master's program is designed to provide individuals with a broad range of data management, analysis and computer skills necessary to serve as research

associates in academia, government, and business. At the doctoral level, a student may choose a specialty within one of three areas: theoretical measurement, applied statistics, and program evaluation.

Course Code: EDMS

## MECHANICAL ENGINEERING (ENME)

### A. James Clark School of Engineering

2181 Engineering Classroom Building, (301) 405-2410  
[www.enme.umd.edu/](http://www.enme.umd.edu/)

Professor and Chair: Bar-Cohen  
 Director, Undergraduate Studies: Ainane  
 Professors: Anand, Azam, Barker, Bar-Cohen, Baz, Bernard, Dasgupta, diMarzo, Duncan, Fourney, Gupta, A., Holloway, Magrab, Mote, Ohadi, Pecht, Piomelli, Rademacher, Wallace  
 Associate Professors: Balachandran, Bigio, DeVoe, Gupta, S., Han, Herold, Herrmann, Kiger, Kim, McClosky, Sandborn, Schmidt, Shih, Wang, Zhang  
 Assistant Professors: Balaras, Bruck, Buckley, Hristu-Versakalis, Jackson, Ramahi, Robbins, Smela  
 Lecturers: Coder, Haslach, Rothblom  
 Emeriti: Allen, Armstrong, Berger, Buckley, Cunniff, Dieter, Jackson, Kirk, Marks, Sanford, Sayre, Shreeve, Talaat, Walston, Yang

### The Major

The mechanical engineering major prepares the student for the challenges of today and the future. The curriculum is one of the most up-to-date and forward-looking programs in the country. Students become involved with real-world engineering projects early on in the program through extensive interaction with engineers from industry and this interaction is continued throughout the curriculum. The coursework is now fully integrated in order to provide a seamless experience in their undergraduate education. The student graduates with the skills and the knowledge base which are necessary for success in today's marketplace and with the education necessary to adapt and succeed in the future as technology continues to change.

The mechanical engineer of today faces a more extensive range of critical problems than ever before. It is essential that the graduate be skilled not only in the traditional fundamentals of mechanical engineering such as solid mechanics, fluid mechanics, thermodynamics, heat transfer, materials engineering, electronic instrumentation and measurements, controls and design, but also in new and emerging areas such as mechatronics, smart structures, electronic packaging, communication, information systems, total quality management, reliability and electromechanical systems. Most of these topics require extensive use of modern computing hardware and software. New classrooms which are equipped with state-of-the-art computers and software have been added and these facilities are used as an on-going part of many courses. The student is taught to make use of this capability and to make sound engineering judgments while analyzing the seemingly unmanageable amounts of data and information which are obtained. Attributes such as teamwork, ethics, social awareness, and leadership are emphasized in many courses.

Electives taken during the senior year prepare the graduate to choose any of a number of career paths or to select a broad-based group of electives. All students work on projects throughout their program, many of which teach the advantages of teamwork and the skills required for a team to succeed. Individual projects provide the opportunity for sometimes far-out creative thinking. In all cases, the students work closely with individual faculty members who serve as teachers, advisors, and mentors. Many undergraduate students have the opportunity to serve as Research Fellows and/or Teaching Fellows in the department.

### Requirements for Major

	Semester Credit Hours	
	I	II
<b>Freshman Year</b>		
MATH 140—Calculus I.....	4	
MATH 141—Calculus II .....	4	
CHEM 135—General Chemistry for Engineers.....	3	
PHYS 161—General Physics.....	3	
ENGL101—Introduction to Writing.....	3	
ENES 100—Introduction to Engineering Design.....	3	
ENES 102—Statics.....	3	
CORE Requirements .....	6	
<b>Total Credits .....</b>	<b>13</b>	<b>16</b>

### Sophomore Year

MATH 241—Calculus III .....	4
MATH 246—Differential Equations .....	3
PHYS 262, 263—General Physics. ....	4
ENES 220—Mechanics of Materials .....	3
ENES 221—Dynamics .....	3
ENME 232—Thermodynamics .....	3
ENME 271—Introduction to MATLAB .....	3
CORE Requirements .....	3
<b>Total Credits .....</b>	<b>17</b>

### Junior Year

ENME 331—Fluid Mechanics.....	3
ENME 332—Transfer Processes .....	3
ENME 350—Electronics and Instrumentation I .....	3
ENME 351—Electronics and Instrumentation II .....	3
ENME 361—Vibration, Controls, and Optimization I .....	3
ENME 371—Product Engineering and Manufacturing.....	3
ENME 382—Engineering Materials and Manufacturing Processes.....	3
ENME 392—Statistical Methods for Product and Process Development .....	3
ENGL 393 —Technical Writing .....	3
CORE Requirements .....	3
<b>Total Credits .....</b>	<b>15</b>

### Senior Year

ENME 462—Vibration, Controls, and Optimization II.....	3
ENME 472—Integrated Product and Process Development II* .....	3
Technical Electives* .....	9
CORE Requirements .....	3
<b>Total Credits .....</b>	<b>12</b>

\*At least three of the four technical electives must be design.

### Sample Elective Topics

Computer-Aided Design and Manufacturing  
 Packaging of Electronic Systems  
 Energy Conversion  
 Engineering Management  
 Engineering Software Development  
 Environmental Engineering  
 Fracture Mechanics  
 Automotive Design  
 Robotics  
 Manufacturing  
 Mechatronics  
 Micro-Electro-Mechanical Systems

### Admission

Admission requirements are identical to those set by the Clark School of Engineering. Please consult chapter 1.

### Advising

All mechanical engineering students are required to meet with an adviser during registration. Contact the Undergraduate Advising Office, 2188 Engineering Classroom Building.

### Cooperative Education Program

Participation in the Cooperative Education Program is encouraged. See chapter 1 for details.

### Financial Assistance

A very limited amount of financial aid is available. Information may be obtained in the Undergraduate Advising Office.

### Honors and Awards

The Honors Program is administered through the Clark School of Engineering. Individual honors and awards are presented based on academic excellence and extracurricular activities.

## 132 Meteorology

### Student Organizations

Student chapters of professional societies include the American Society of Mechanical Engineers, the Society of Automotive Engineers, the Society of Manufacturing Engineers, and the American Society of Heating, Refrigeration and Air Conditioning Engineers. The mechanical engineering honor society is Pi Tau Sigma. Information regarding these societies may be obtained at 2188 Engineering Classroom Building.

Course Code: ENME

### METEOROLOGY (METO)

#### College of Computer, Mathematical, and

#### Physical Sciences

3424 Computer and Space Sciences Building, New Wing (301) 405-5391  
[www.atmos.umd.edu](http://www.atmos.umd.edu)

Professor and Chair: Dickerson  
Professors: Baer, Busalacchi, Carton, Ellingson, Hudson, Kalnay, Li, Pinker, Thompson, Vernekar (Emeritus) and Zhang  
Assistant Professor: Kirk-Davidoff, Zeng  
Adjunct Professor, Michael King

The Department of Meteorology offers several courses to undergraduate students. Undergraduates can take courses individually or as part of a Citation (minor) in Meteorology which can prepare them for careers in Meteorology and Earth Sciences or for graduate studies in these areas. Three Citation tracks are available:

Citation in Meteorology  
Citation in Weather and Climate  
Citation in Atmospheric Chemistry

The Citation in Meteorology is the most suitable preparation for graduate students in Meteorology. For more details visit: [atmos.umd.edu/CITATION](http://atmos.umd.edu/CITATION) or contact the Undergraduate Advisor, R. Hudson: ([hudson@atmos.umd.edu](mailto:hudson@atmos.umd.edu)).

The following undergraduate courses are offered in METO:

METO 123—Global Change—Implications of Global Climate Change  
METO 200—Weather & Climate—Atmospheric sciences and forecasting  
METO 201—Weather & Climate Lab—Laboratory for METO 201  
METO 400—The Atmosphere—Weather and Climate Systems  
METO 401—Global Environment—The Atmosphere-Ocean-Biosphere  
METO 431—Meto Scientists & Engineers I—Meteorology for Scientists and Engineers I  
METO 432—Meto Scientists & Engineers II—Meteorology for Scientists and Engineers II  
METO 434—Air Pollution—Generation, transport and removal of air pollutants  
METO 499—Special Problems in Atmospheric Sciences—Research in Atmospheric Sciences

Undergraduates can also pursue a bachelor's degree in Physical Sciences, which has a specialty in Meteorology. The Advisor for the Physical Sciences program, Tom Gleason, can be contacted at [tgleason@physics.umd.edu](mailto:tgleason@physics.umd.edu). Students who anticipate careers in Meteorology should consult the undergraduate advisor of the Department of Meteorology as early as possible in their studies.

### MICROBIOLOGY

Departments in the College of Life Sciences have been reorganized. Courses in microbiology are now offered by the Department of Cell Biology and Molecular Genetics.

### SCHOOL OF MUSIC (MUSC)

#### College of Arts and Humanities

Clarice Smith Performing Arts Center (301) 405-5549

Director: Kendall  
Associate Director: Fry  
Professors: Cohen, Cossa, Dalley, DeLio, Elsing, Fischbach, Gibson, Heifetz, Kendall, Mabbs, Major, Montgomery, Moss, Pacholczyk, Page, Robertson, Rodriguez, Soyer, Steinhardt, Tree, Wexler

Associate Professors: Balthrop, Barnett, Davis, Dedova, Elliston, Gekker, Gowen, Haggh-Huglo, Hill, Loup, Maclary, McCarthy, Provine, Ross, Salness, Sparks, Stern, Vadala, Wakefield, Wilson, Ziegler  
Assistant Professors: DeLapp, Hanninen, Hewitt, King, Miller, Payerle, Sloan.  
Instructors: Walters  
Lecturers: Adkins, Beicken, Burris, Cavallaro, Cole, Foster, Guilford, Hackelman, Hanks, Hardy, Harwell, Heineman, Hendrickson, Huling, Kitt, Kouyate, Kraft, JamesKunkel, Layton, Murdock, Okamoto, Oppelt, Randall, Slowik, Smith, Smith, Sternstein, Stevens, Suadin, Tafoya, Trahan, Turner, Underwood, Vance, Volchok, Wells  
Adjunct Research Professors: Huglo, Michel  
Artists in Residence: Preucil, Watts  
Visiting Associate Professors: Durrant, Greer

### The Major

Admission to all undergraduate music major degree programs (B.M., B.A., and B.M.E.) is based on a required performance audition before a faculty committee. Audition dates and requirements are available from the School of Music office.

Departmental advising is mandatory for all music majors every semester.

The objectives of the school are (1) to provide professional musical training based on a foundation in the liberal arts; (2) to help the general student develop sound critical judgment and discriminating taste in the performance and literature of music; (3) to prepare the student for graduate work in the field; and (4) to prepare the student to teach music in the public schools. To these ends, three degrees are offered: (a) the Bachelor of Music, with majors in theory, composition, and music performance, (b) the Bachelor of Arts, with a major in music and (c) Bachelor of Music in Music Education in conjunction with and certification from the College of Education.

Required music courses and private lessons are open to music majors who have completed the specified prerequisites, or their equivalents. Lessons are also available for qualified non-music majors, if teacher, time and facilities permit. All ensembles in the School of Music are open by audition to any student.

### The Bachelor of Music Degree

Designed for qualified students with extensive pre-college training and potential for successful careers in professional music. B.M. degree programs are offered in the following: Piano, Voice, Violin, Viola, Cello, Bass, Flute, Oboe, Clarinet, Bassoon, Saxophone, Horn, Trumpet, Trombone, Tuba, Euphonium, Percussion, Harp, Composition, and Theory.

The College of Arts and Humanities requirements are waived for students majoring in B.M. Degree programs.

### Bachelor of Music Requirements:

In addition to CORE courses and music courses specific to each instrument or program listed above, B.M. students generally complete the following:

- 8 semesters of private lessons (Senior Recital in final semester)
- 8 semesters of large ensemble participation
- 8 semesters of small ensemble participation
- 4 semesters of music theory
- 3 semesters of music history
- 2 semesters of class piano (except piano majors)
- 1 semester of form and analysis
- 1 semester of conducting
- 1 semester of music literature
- 1 semester of music pedagogy
- 6 credits of music electives

The B.M. programs vary according to instrument or emphasis. Contact the School of Music for specific requirements.

### The Bachelor of Arts Degree

Designed for qualified students whose interests include a broader liberal arts experience. The College of Arts and Humanities requirement of 45 upper level credits and a foreign language to the intermediate level apply to all B.A. students. B.A. degree programs are offered in the following: Piano, Voice, Violin, Viola, Cello, Bass, Flute, Oboe, Clarinet, Bassoon, Saxophone, Horn, Trumpet, Trombone, Tuba, Euphonium, Percussion, Harp and Jazz Studies.

**Bachelor of Arts in Music Requirements:**

In addition to CORE courses and music courses specific to each instrument or program listed above, B.A. students generally complete the following:

- 5 semesters of private lessons (Senior Recital in final semester)
- 5 semesters of ensemble participation
- 4 semesters of music theory
- 3 semesters of music history
- 2 semesters of class piano (except piano majors)
- 1 semester of form and analysis
- 6 credits of music electives

The B.A. programs vary according to instrument or emphasis. Contact the School of Music for specific requirements.

**The Bachelor of Music in Music Education**

Changes in requirements are under review. Students should consult the department for updated information. Designed for qualified students preparing for careers in pre-K - Grade 12 teaching of music, the B.M. in Music Education offered by the College of Arts and Humanities carries with it a teaching certification from the College of Education. B.M. in Music Education degrees are offered with concentrations in either Instrumental Music Education or Choral-General Music Education. The requirements for a B.M. in Music Education are similar to the B.M. program plus approximately 48 credits in music education. Contact the School of Music for specific requirements.

In addition to CORE requirements, plus the above BM requirements, Music Education students generally complete the following (for a total of 145 credits):

- 23 credits of MUED (class instruments and field experience)
- 6 credits of EDHD (Human Development)
- 3 credits of EDPL (Policy and Leadership)
- 3 credits of EDCI 463 (Curriculum and Instruction)
- 3 credits EDCI 484 (Elem. Student Teaching)
- 3 credits EDCI 494 (Sec. Student Teaching)

**Citation in Music Performance**

Sixteen credit hours consisting of the following:

- 3 semesters of private lessons
- 3 semesters of ensemble participation
- MUSC 130 Survey of Music Literature
- MUSC 140 Fundamentals of Music
- 1 music elective from approved list.

**Citation in Music Studies**

Fifteen credit hours consisting of the following:

- MUSC 130 Survey of Music Literature
- MUSC 140 Fundamentals of Music
- MUET 200, 210 or 220
- 2 music electives from approved list.

Students who fulfill Citation requirements will receive a Citation on the official transcript. Please contact the School of Music Office for more information.

**Special Programs**

The School of Music cooperates with other departments in double majors, double degrees, and Individual Studies programs Details are available on request.

Course Codes: MUED, MUET, MUSC, MUSP

**NATURAL RESOURCES MANAGEMENT PROGRAM (NRMT)**

**College of Agriculture and Natural Resources**

1457 Animal Sciences/Biological Resources Engineering Building  
[www.nrm.umd.edu](http://www.nrm.umd.edu)  
 (301) 405-1198; km173@umail.umd.edu

Associate Professor and Coordinator: Kangas  
 Assistant Professors: Baldwin, Tilley  
 Instructor: Adams

**The Program**

The Natural Resources Management program provides three majors for students to focus their undergraduate study. The majors are designed to allow students to customize their degree around their strongest interest. Each curriculum consists of: 1) a common core of required courses, 2) additional required courses per each option area, and 3) 20 credits of restricted electives. The common core and additional option requirements provide the student with the breadth necessary for dealing with environmental issues, while the electives allow the student to focus on the appropriate major specialization. The elective credits are divided evenly between science and management courses. The student chooses these electives in consultation with their academic advisor from an extensive list of approved courses.

The goal of the Natural Resources Management Program is to teach students concepts dealing with the sound use and management of natural resources. In the program, the role of natural resources in economic development is balanced with concern for society and the environment.

**Land and Water Resources Management**

This concentration provides students with the knowledge and skills they need to work in such positions as Hydrologists, Environmental Consultants, Wetland Ecologists, Waste Managers, and Environmental Planners.

**Plant and Wildlife Resources Management**

This concentration provides students with the knowledge and skills they need to work in such positions as Wildlife Biologists, Nursery Managers, Fisheries Biologists, and Naturalists.

**Environmental Education and Park Management**

This concentration provides students with the knowledge and skills they need to work in such positions as Naturalists, Park Rangers, Park Superintendents, Environmental Educators, and Recreational Guides

**Natural Resources Management Curriculum**

**Common Core of Requirements for all Natural Resources Management Majors**

	<b>Credit Hours</b>
University CORE Program Requirements*	40
AREC 240—Introduction to Economics and the Environment*	4
AREC 332—Introduction to Natural Resources Policy	3
BIOM 301—Introduction to Biometrics	3
BSCI 106—Principles of Biology II	4
CMSC 102—Introduction to Information Technology or	3
CMSC 103—Introduction to Computing	3
GEOG 201—Geography of Environmental Systems and	3
GEOG 211—Geography of Environmental Systems Laboratory* or	1
GEOL 100—Physical Geology and	3
GEOL 110—Physical Geology Laboratory*	1
GVPT 100—Principles of Government and Politics	3
GVPT 273—Introduction to Environmental Politics or	3
GVPT 306—Global Ecopolitics	3
MATH 113—College Algebra with Applications* or	3
MATH 115—Precalculus*	3
NRMT 389—Internship	3
NRMT 470—Natural Resources Management	4

**Additional Requirements for Option Areas A and B:**

**Land and Water Resources Management and Plant and Wildlife Resources Management**

	<b>Credit Hours</b>
BSCI 105—Principles of Biology I.....	4
BSCI 223—General Microbiology*	4
BSCI 460/461—Plant Ecology (3) and Plant Ecology Laboratory (2) or	5
BSCI 361—Principles of Ecology	4
CHEM 103—General Chemistry I	4
CHEM 113—General Chemistry II*	4
GEOG 340—Geomorphology or.....	3
GEOG 341—Geomorphology	4
MATH 140—Calculus I* or	4
MATH 220—Elementary Calculus I*	3
NRSC 200—Fundamentals of Soil Science*	4
PHYS 117—Introduction to Physics* or	4
PHYS 121—Fundamentals of Physics I	4
SOCY 305—Scarcity and Modern Society	3

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### Additional Requirements for Option Area C: Environmental Education and Park Management

	<b>Credit Hours</b>
ANTH 260—Introduction to Sociocultural Anthropology and Linguistics* ...3	3
BMGT 110—Introduction to Business and Management .....	3
BMGT 360—Human Resources Management* .....	3
BSCI 460/461—Plant Ecology (3) and Plant Ecology Laboratory (2) .....	5
COMM 107—Oral Communication: Principles and Practices .....	3
EDCI 473—Environmental Education .....	3
GVPT 100—Principles of Government & Politics* .....	3
NRMT 460—Principles of Wildlife Management.....	3
NRSC 105—Soil and Environmental Quality*.....	3
PLSC 100—Introduction to Horticulture .....	4

\*May satisfy college requirements and/or a CORE requirement.

### Restricted Electives— Chosen in Consultation of an Advisor Land and Water Resource Management

Science Area .....	10
Management Area .....	10

### Plant and Wildlife Resource Management

Science Area .....	10
Management Area.....	10

### Environmental Education and Park Management

Science Area .....	10
Management and Education Area .....	10

## Advising

Advising is mandatory. See the Coordinator, 1457 Animal Sciences/Biological Resources Engineering Building, (301) 405-1198.

## Student Organization

Students may join the Natural Resources Management Society. Further information is available from the Natural Resources Management program office at 1457 Animal Sciences/Biological Resources Engineering Building.

Course Code: NRMT

## NATURAL RESOURCE SCIENCES (NRSC)

### College of Agriculture and Natural Resources

2102 Plant Sciences Building  
(301) 405-4351, (301) 405-4355  
cw5@uemail.umd.edu, kh26@uemail.umd.edu  
[www.nrsl.umd.edu/](http://www.nrsl.umd.edu/)

Professor and Chair: Weismiller

Professors: Angle, Coale, Dernoeden, Fretz, R. Hill, James, Kenworthy, McIntosh\*, Miller, Mulchi, Ng, Quebedeaux, Rabenhorst, Solomos, Walsh, Weil

Associate Professors: Beste, Bouwkamp, Carroll, Coleman, Costa, Deitzer, Everts, Glenn, Grybauskas, M. Hill, Lea-Cox, Ritter, Slaughter, J.B. Sullivan, J.H. Sullivan, Swartz, Turner, Vough

Assistant Professors: Chang, Dzantor, Kratochvil, Momen, Myers, Needelman

Instructors: Buriel, Nola, Steinhilber

Professor of the Practice: Cohan

Affiliate Professors: Kearney, Fiola

Adjunct Professors: Chappelle, Lee, Tamboli

Adjunct Associate Professors: Daughtry, Mallow, Meisinger, Montroll, Saunders, Van Berkum

Adjunct Assistant Professor: Pooler

Professors Emeriti: Aycok, Axley, Bandel, Clark, Decker, Fanning, Gouin, Hoyert, Kuhn, Link, McClurg, Miller, Oliver, Shanks, Stark, Thompson, Wiley

\*Distinguished Scholar-Teacher

## The Major

The Department of Natural Resource Sciences and Landscape Architecture offers three undergraduate majors. Two lead to the Bachelor of Science (B.S.) degree; one in Natural Resource Sciences and the other in General Agriculture Sciences. The third major leads to a Bachelor of Landscape Architecture (B.L.A.) degree. For additional information on General Agriculture Sciences and Landscape Architecture, see the entry for those programs earlier in this chapter.

Undergraduate students enrolled in the Natural Resource Sciences major must select one of the following six areas of concentration:

- Conservation of Soil, Water and Environment (Area A)
- Horticulture and Crop Production (Area B)
- Landscape Management (Area C)
- Plant Science (Area D)
- Turf and Golf Course Management (Area E)
- Urban Forestry (Area F)

The Natural Resource Science major combines the principles of basic science with a thorough understanding of plant, soil and environmental sciences. This amalgamation of basic and applied sciences provides graduates with the opportunity for careers in conserving soil and water resources, improving environmental quality, increasing crop production to meet the global need for food, and in the 'Green Industry' which involves beautifying and maintaining the urban landscape.

These NRSC curricula are flexible enough to allow the student to concentrate on basic science courses that are needed for graduate work or to select courses that prepare for employment after completing a bachelor's degree. NRSC areas of concentration such as 'Plant Science' or 'Conservation of Soil, Water and the Environment' are meant to specifically prepare students for graduate studies. Students completing graduate programs in NRSC are prepared for research, teaching, and management positions with industry, international agencies, or federal and state government.

Graduates with a B.S. degree are employed by private corporations as environmental soil scientists, golf course managers, urban foresters, and agribusiness company representatives. They may also find positions in county, state, or federal government as agronomists, nutrient management specialists, or extension agents. Horticulture is a diverse profession that also has numerous employment opportunities. These range from production opportunities in fruit, vegetable, flower and nursery crops to the landscape industry. NRSC graduates are also in high demand throughout the world in traditional horticultural production, international trade and in the growing fields of biotechnology and bioremediation.

## Curriculum in Natural Resource Sciences

### NRSC Major

<b>Requirements for all Areas of Concentration</b>	<b>Semester Credit Hours</b>
CHEM 103—General Chemistry I .....	4
ENGL 101—Introduction to Writing .....	3
ENGL 393—Technical Writing .....	3
MATH 113—College Algebra with Applications, or	
MATH 115—Precalculus .....	3
NRSC 200—Fundamentals of Soil Science .....	4
NRSC 398—Seminar .....	1
PLSC 100—Introduction to Horticulture, or	
PLSC 101—Introductory Crop Science .....	4

With the exception of ENGL 101 and ENGL 393, a grade of C or better in the above courses is required.

### Area A: Conservation of Soil, Water and Environment Requirements

CHEM 113—General Chemistry II .....	4
CHEM 104—Fundamentals of Organic and Biochemistry, or	
CHEM 233—Organic Chemistry I .....	4
COMM 100—Foundations of Oral Communication, or	
COMM 107—Oral Communication: Principles and Practices .....	3
GEOL 100/110—Physical Geology .....	4
MATH 140—Calculus 1, or	
MATH 220—Elementary Calculus I .....	4
PHYS 117—Introduction to Physics .....	4

\*Students intending to take additional chemistry or attend graduate school should substitute CHEM 113, followed by CHEM 233 and CHEM 243.

<b>Applications &amp; Breadth (Select three of the following) .....</b>	<b>9</b>
NRSC 413—Soil and Water Conservation .....	3
NRSC 415—Soil Survey and Land Use .....	3
NRSC 423—Soil-Water Pollution .....	3
NRSC 444—Remote Sensing of Agric and Natural Resources .....	3
NRSC 461—Hydric and Hydromorphic Soils .....	3

### Advanced Soil Science (Select three of the following) .....

NRSC 411—Principles of Soil Fertility .....	3
NRSC 414—Soil Morphology, Genesis and Classification .....	4
NRSC 417—Soil Hydrology and Physics .....	3
NRSC 421—Soil Chemistry .....	4
NRSC 422—Soil Microbiology .....	3

**Practical Experience (Select at least 2 credits) .....2**  
 NRSC 308—Field Soil Morphology .....1-3  
 NRSC 389—Internship .....3

**Supporting Courses (Select two of the following) .....6**  
 AREC 432—Introduction to Natural Resources Policy .....3  
 BIOM 301—Introduction to Biometrics .....3  
 ENBE 234—Principles of Erosion and Water Control (1) and  
 ENBE 236—Design of Drainage Systems (1) and  
 ENBE 237—Design of Irrigation Systems (1) .....3  
 GEOL 451—Groundwater Geology .....3  
 GEOL 452—Watershed and Wetland Hydrology .....3  
 GEOL 340—Geomorphology (4), or  
 GEOG 340—Geomorphology .....3  
 NRMT 451—Water Quality: Field and Lab Analysis Methods .....3  
 NRSC 440—Crops, Soils and Civilization .....3  
 NRSC 441—Sustainable Agriculture .....3  
 NRSC 454—Environmental Issues in Plant and Soil Sciences .....3  
 PLSC 406—Forage Crops .....3  
 PLSC 407—Cereal and Oil Crops .....3

Total CORE, NRSC and Conservation of Soil, Water and  
 Environment Area .....95  
 University Electives .....25

**Area B: Horticulture and Crop Production - Requirements**

AREC 250—Elements of Agricultural and Resource Economics .....3  
 AREC 306—Farm Management .....3  
 BSCI 226—Plant Taxonomy, or  
 BSCI 490—Plant Structure .....4  
 BSCI 227—Principles of Entomology .....4  
 CHEM 104—Fundamentals of Organic and Biochemistry .....4  
 NRSC 201—Plant Structure and Function .....4  
 NRSC 389—Internship .....3  
 NRSC 410—Principles of Plant Pathology .....4  
 NRSC 411—Principles of Soil Fertility .....3  
 NRSC 484—Environmental Plant Physiology .....3  
 PLSC 202—Management of Horticultural Crops, or  
 PLSC 271—Plant Propagation, or  
 NRSC 203—Plants, Genes and Biodiversity .....3  
 PLSC 453—Weed Science .....3

**Advanced Production Electives (Select four of the following)**

BSCI 497—Insect Pests of Ornamentals and Turf .....3  
 NRSC 4xx—Soils Courses (Minimum of two) .....6-8  
 PLSC 4xx—Crops Courses (Minimum of two) .....6-8  
 PLSC 305—Introduction to Turf Management .....3  
 PLSC 432—Greenhouse Crop Production .....3  
 PLSC 433—Technology of Fruit and Vegetable Crop Production .....4  
 PLSC 452—Principles of Landscape Establishment and  
 Maintenance .....3  
 PLSC 456—Nursery Crop Production .....3  
 PLSC 472—Advanced Plant Propagation .....2  
 PLSC 474—Physiology of Maturation and Storage of  
 Horticultural Crops .....3  
 Total CORE, NRSC and Horticulture and Crop Production Area .....104-108  
 University Electives .....12-16

**Area C: Landscape Management - Requirements**

AREC 250—Elements of Agricultural & Resource Economics, or  
 ECON 200—Principles of Economics II .....3  
 BMGT 220—Principles of Accounting .....3  
 BMGT 350—Marketing Principles and Organization .....3  
 BSCI 227—Principles of Entomology .....4  
 CHEM 104—Fundamentals of Organic and Biochemistry .....4  
 NRSC 201—Plant Structure and Function .....4  
 NRSC 389—Internship .....3  
 NRSC 410—Principles of Plant Pathology .....4  
 PLSC 161—Graphic Applications for Landscape Management .....3  
 PLSC 200—Land Surveying .....2  
 PLSC 202—Management of Horticultural Crops .....4  
 PLSC 253—Woody Plant Material I .....3  
 PLSC 254—Woody Plant Material II .....3  
 PLSC 255—Landscape Design and Implementation .....3  
 PLSC 261—Computer Applications in Landscape Management .....3  
 PLSC 271—Plant Propagation .....3  
 PLSC 305—Introduction to Turf Management, or  
 NRSC 411—Principles of Soil Fertility .....3  
 PLSC 320—Principles of Site Engineering .....4  
 PLSC 321—Landscape Structures and Materials .....3  
 PLSC 452—Principles of Landscape Establishment and Maintenance .....3  
 LARC 160—Introduction to Landscape Architecture .....3  
 Total CORE, NRSC and Landscape Management Area .....105  
 University Electives .....15

**Area D: Plant Science - Requirements**

BSCI 227—Principles of Entomology .....4  
 BSCI 442—Plant Physiology, or  
 CHEM 113—General Chemistry II .....4  
 CHEM 233—Organic Chemistry I .....4  
 MATH 140—Calculus I, or  
 MATH 220—Elementary Calculus I .....3  
 NRSC 201—Plant Structure and Function .....4  
 NRSC 203—Plants, Genes and Biodiversity .....3  
 NRSC 410—Principles of Plant Pathology .....4  
 NRSC 484—Environmental Plant Physiology .....3  
 PHYS 121—Fundamentals of Physics I .....4  
 PLSC 202—Management of Horticultural Crop Production .....4  
 PLSC 271—Plant Propagation .....3  
 PLSC 399—Special Problems in Horticulture .....3  
 PLSC 472—Advanced Plant Propagation .....2

**Advanced Plant Science Electives (Select one of the following)**

PLSC 400—Nurs & Greenhouse Nutrient Mngmnt Planning .....3  
 PLSC 403—Crop Breeding .....3  
 PLSC 432—Greenhouse Crop Production .....3  
 PLSC 433—Technology of Fruit and Vegetable Crop Production .....4  
 PLSC 452—Principles of Landscape Establishment and Maintenance .....3  
 PLSC 456—Nursery Crop Production .....3  
 PLSC 474—Physiology of Maturation and Storage of Horticultural Crops.. 3

**Advanced Science Electives (Select one of the following)**

BCHM 261—Elements of Biochemistry, or  
 BCHM 461—Biochemistry I .....3  
 BSCI 435—Plant Biochemistry .....4  
 NRSC 411—Principles of Soil Fertility .....3  
 NRSC 417—Soil Hydrology and Physics .....3  
 NRSC 421—Soil Chemistry .....4  
 PHYS 122—Fundamentals of Physics II .....3

Total CORE, NRSC and Plant Science Area .....101-104  
 University Electives .....16-19

**Area E: Turf and Golf Course Management - Requirements**

BSCI 105—Principles of Biology I .....4  
 BSCI 106—Principles of Biology II .....4  
 BSCI 227—Principles of Entomology .....4  
 CHEM 104—Fundamentals of Organic and Biochemistry .....4  
 COMM 100—Foundations of Oral Communication, or  
 COMM 107—Oral Communication: Principles and Practices .....3  
 ENBE 237—Design of Irrigation Systems .....1  
 NRSC 389—Internship .....3  
 NRSC 410—Principles of Plant Pathology .....4  
 NRSC 411—Principles of Soil Fertility .....3  
 NRSC 484—Environmental Plant Physiology .....3  
 PHYS 117—Introduction to Physics, or  
 PHYS 121—Fundamentals of Physics I .....4  
 PLSC 305—Introduction to Turf Management .....3  
 PLSC 401—Pest Management Strategies for Turfgrass .....3  
 PLSC 402—Sports Turf Management .....3  
 PLSC 410—Commercial Turf Maintenance and Production .....3  
 PLSC 453—Weed Science .....3

Total CORE, NRSC and Turf and Golf Course Management Area .....99  
 University Electives .....21

**Area F: Urban Forestry - Requirements**

AREC 240—Introduction to Economics and the Environment .....3  
 BMGT 220—Principles of Accounting I .....3  
 BSCI 227—Principles of Entomology .....4  
 BSCI 497—Insect Pests of Ornamentals & Turf .....3  
 CHEM 104—Fundamentals of Organic and Biochemistry or  
 CHEM 113—General Chemistry II .....4  
 LARC 160—Introduction to Landscape Architecture .....3  
 NRSC 201—Plant Structure and Function .....4  
 NRSC 271—Introduction to Forestry and Silviculture .....4  
 NRSC 371—Principles of Arboriculture and Urban Forestry .....3  
 NRSC 389—Internship .....3  
 NRSC 410—Principles of Plant Pathology .....4  
 NRSC 411—Principles of Soil Fertility .....3  
 NRSC 471—Forest Ecology .....3  
 NRSC 472—Capstone - Urban Forest Project Management .....3  
 NRSC 484—Environmental Plant Physiology .....3  
 PLSC 253—Woody Plant Material I .....3  
 PLSC 254—Woody Plant Material II .....3  
 PLSC 261—Computer Applications in Landscape Management .....3

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## Suggested Core Courses and Electives

BIOM 301*—Introduction to Biometrics .....	3
BSCI 460—Plant Ecology (3) or	
BSCI 460 & 461—(Plant Ecology Lecture and Lab) .....	5
CHEM 233*—Organic Chemistry I .....	4
CHEM 243*—Organic Chemistry II .....	4
COMM 107—Oral Communication: Principles and Practices .....	3
GEOG 201—Geography of Environmental Systems .....	3
GEOG 347—Introduction to Biogeography .....	3
GVPT 170—Introduction to American Government .....	3
GVPT 273—Introduction to Environmental Politics .....	3
LARC 450—Environmental Resources .....	3
MATH 220*—Elementary Calculus I .....	3
NRMT 460—Principles of Wildlife Management.....	3
NRMT 461—Urban Wildlife Management .....	3
NRMT 489B—Field Experience: Park Management .....	1
NRSC 203—Plants, Genes and Biodiversity .....	3
NRSC 413—Soil & Water Conservation .....	3
NRSC 415—Soil Survey and Land Use .....	3
NRSC 444—Remote Sensing of Agriculture and Natural Resources .....	3
NRSC 473—Woody Plant Physiology .....	3
NRSC 474—Silviculture .....	4
NRSC 484*—Environmental Plant Physiology .....	3
PHYS 121*—Fundamentals of Physics I.....	4
PHYS 122*—Fundamentals of Physics II or the following	
two-semester sequence:.....	4
PHYS 141*—Principles of Physics .....	4
PHYS 142*—Principles of Physics .....	4
PLSC 200—Surveying.....	2
PLSC 320—Principles of Site Engineering .....	3
SOCY 100—Introduction to Sociology .....	3
SOCY 105—Introduction to Contemporary Social Problems .....	3
SOCY 305—Scarcity and Modern Society .....	3
SPAN 223—United States Latino Culture .....	3
URSP 100—Challenge of the Cities.....	3
URSP 320—Planning of the Contemporary City .....	3
URSP 372—Diversity and the City .....	3

Total CORE, NRSC and Urban Forestry Area.....	99
University Electives .....	21

\*Note: Courses with an asterisk are suggested electives for students planning on graduate study in Forestry.

## Fieldwork and Internship Opportunities

Internships with scientists are available at nearby federal and state agencies. Numerous internships also exist and can be readily arranged for students interested in private sector employment.

## Student Organizations

The Agronomy Club and the student chapter of the Soil and Water Conservation Society provide students with opportunities for professional activities. The department sponsors student teams that participate in regional and national contests. These teams prepare in the following areas: soil judging, weeds and crops, and landscape contracting.

The Horticulture Club provides students with opportunities to get involved with on-campus activities. The main goals of the club are traveling and seeing a broad perspective of horticulture, as well as being active in the community in environmental and social programs.

## Scholarships

Numerous scholarships and awards are available to NRSC students. Contact the Associate Dean's office at 301-405-2078 for additional information. In addition, the Department also maintains a listing of scholarships. Contact Kathy Hunt in 2102 Plant Sciences.

## NUTRITION AND FOOD SCIENCE (NFSC)

**College of Agriculture and Natural Resources**  
**0112 Skinner Building, (301) 405-1014 - fax: (301) 314-3314**  
**[www.agnr.umd.edu/users/nfsc](http://www.agnr.umd.edu/users/nfsc)**

Chair: Lei  
Professors: Bean, Castonguay, Moser-Veillon†  
Associate Professors: Jackson, Kantor, Meng  
Assistant Professors: Giusti, Lo, Magnuson, Sahyoun

Lecturer: Brenowitz  
Adjunct Professor: DeLuca, Hansen  
Adjunct Associate Professor: McKenna  
Research Professor: Lineback  
Emeriti: Ahrens, Schlimme, Wiley  
†Distinguished Scholar-Teacher

The department offers three areas of emphasis: dietetics, food science, and nutritional science. Each program provides for competencies in several areas of work; however, each option is designed specifically for certain professional careers.

## Requirements for Major

The **Dietetics** major develops an understanding and competency in food, nutrition, dietetics management, clinical nutritional care, nutrition education, and community nutrition. The dietetics program is approved by the Commission on Accreditation for Dietetics Education, and qualifies students, after completion of a post-baccalaureate internship, to sit for the national exam to become a registered dietitian.

The **Food Science** major is concerned with the application of the fundamental principles of the physical, biological, and behavioral sciences and engineering to understand the complex and heterogeneous materials recognized as food. The food science program is approved by the Institute of Food Technologists and prepares students for careers in food industry and food safety.

The **Nutritional Science** major emphasizes the physical and biological sciences in relation to nutrition and the development of laboratory skills in these areas. Students in this major frequently elect to go on to graduate or medical school.

**Grades.** All students are required to earn a grade of C or better in courses applied toward satisfaction of the major. This includes all required courses with a prefix of NFSC, as well as certain required courses in supporting fields. A list of these courses for each program may be obtained from the department office.

## Program Requirements

### I. Dietetics

a. Major Subject Courses	
NFSC 100—Elements of Nutrition .....	3
NFSC 112—Food Science and Technology .....	3
NFSC 250—Science of Food .....	4
NFSC 315—Nutrition During the Life Cycle.....	5
NFSC 350—Food Service Operations.....	3
NFSC 380—Nutritional Assessment .....	3
NFSC 440—Advanced Human Nutrition .....	4
NFSC 460—Medical Nutrition Therapy .....	4
NFSC 470—Community Nutrition .....	3
NFSC 491—Issues and Problems in Dietetics	
(CORE capstone) .....	3
<b>Subtotal .....</b>	<b>35</b>

b. Supporting Courses	
MATH 113—Elementary Algebra OR	
MATH 115—Precalculus .....	3
CHEM 103—General Chemistry I .....	4
CHEM 113—General Chemistry II .....	4
CHEM 233—Organic Chemistry I.....	4
CHEM 243—Organic Chemistry II.....	4
BSCI 105—Principles of Biology I .....	4
BSCI 230—Cell Biology and Physiology .....	4
BSCI 440—Mammalian Physiology .....	4
BSCI 223—General Microbiology .....	4
SOCY 100—Introduction to Sociology .....	3
PSYC 100—Introduction to Psychology .....	3
EDMS 451—Introduction to Educational Statistics OR	
BIOM 301—Introduction to Biometrics .....	3
BCHM 461—Biochemistry I .....	3
BCHM 462—Biochemistry II.....	3
ENGL 101—Introduction to Writing .....	3
ENGL 393—Technical Writing or ENGL 391—Adv. Composition .....	3
BMGT 360—Human Resource Management.....	3
BMGT 364 Management and Organization Theory.....	3
Additional CORE program courses .....	18
Restricted Electives .....	2
Electives .....	3
<b>Subtotal .....</b>	<b>85</b>
<b>TOTAL CREDITS .....</b>	<b>120</b>

**II. Food Science**

a. Major Subject Courses

NFSC 100—Elements of Nutrition. ....	3
NFSC 112—Food Science and Technology .....	3
NFSC 250—Science of Food. ....	4
NFSC 398—Seminar. ....	1
NFSC 412—Principles of Food Processing. ....	4
NFSC 421—Food Chemistry .....	3
NFSC 422—Food Product Research and Development (CORE capstone) .....	3
NFSC 423—Food Chemistry Laboratory. ....	3
NFSC 430—Food Microbiology. ....	2
NFSC 431—Food Quality Control .....	4
NFSC 434—Food Microbiology Laboratory .....	2
NFSC 450—Food and Nutrient Analysis .....	3
<b>Subtotal .....</b>	<b>35</b>

b. Supporting Courses

MATH 113—Elementary Algebra OR	
MATH 115—Precalculus. ....	3
MATH 220—Elementary Calculus I. ....	3
MATH 221—Elementary Calculus II .....	3
CHEM 103—General Chemistry I. ....	4
CHEM 113—General Chemistry II .....	4
CHEM 233—Organic Chemistry I.....	4
CHEM 243—Organic Chemistry II.....	4
BCHM 461—Biochemistry I .....	3
BSCI 105—Principles of Biology I. ....	4
ENBE 414—Mechanics of Food Processing .....	4
BSCI 223—General Microbiology .....	4
PHYS 121—Fundamentals of Physics I. ....	4
ENGL 101—Introduction to Writing. ....	3
ENGL 393—Technical Writing. ....	3
BIOM 301—Introduction to Biometrics .....	3
Additional CORE program requirements. ....	24
Restricted electives. ....	3
Electives .....	5
<b>Subtotal .....</b>	<b>85</b>
<b>TOTAL CREDITS .....</b>	<b>120</b>

**III. Nutritional Science**

a. Major Subject Courses

NFSC 100—Elements of Nutrition. ....	3
NFSC 112—Food Science and Technology (Spring only) .....	3
NFSC 315—Nutrition during the Life Cycle (Spring only) .....	3
NFSC 421—Food Chemistry .....	3
NFSC 440—Advanced Human Nutrition .....	3
NFSC 450—Food and Nutrient Analysis .....	4
NFSC 495—Nutrition Research or CORE Advanced Studies .....	3
<b>Subtotal .....</b>	<b>22</b>

b. Supporting Courses

MATH 113—Elementary Algebra OR	
MATH 115—Precalculus .....	3
MATH 220—Elementary Calculus I .....	3
CHEM 103—General Chemistry I .....	4
CHEM 113—General Chemistry II .....	4
CHEM 233—Organic Chemistry I .....	4
CHEM 243—Organic Chemistry II.....	4
BSCI 230—Cell Biology and Physiology .....	4
BSCI 440—Mammalian Physiology .....	4
PHYS 121—Fundamentals of Physics I .....	4
BCHM 461—Biochemistry I .....	3
BCHM 462—Biochemistry II .....	3
BCHM 464—Biochemistry Laboratory I .....	2
BCHM 465—Biochemistry III.....	3
BSCI 223—General Microbiology .....	4
BIOM 301—Introduction to Biometrics .....	3
ENGL 101—Introduction to Writing .....	3
ENGL 393—Technical Writing .....	3
BSCI 105—Principles of Biology I.....	4
BSCI 222—Genetics .....	4
Additional CORE program requirements .....	24
Restricted electives .....	3
Electives .....	5
<b>Subtotal .....</b>	<b>98</b>
<b>TOTAL CREDITS .....</b>	<b>120</b>

**Advising**

Department advising is mandatory. When planning a course of study, students must consult the Undergraduate Catalog for the year they entered the program and also see an appropriate departmental adviser. Information on advising may be obtained by calling the department office, (301) 405-4520.

**Student Organizations**

The NFSC Department has two active undergraduate clubs: the Food and Nutrition (FAN) club and the Food Science club, which sponsor outreach activities and speakers on career-related topics, and participate in a variety of social activities. Call (301) 405-4520 for more information.

Course Codes: NFSC

**OPERATIONS AND QUALITY MANAGEMENT**

For information, consult the Robert H. Smith School of Business entry in chapter 6.

**PHILOSOPHY (PHIL)**

**College of Arts and Humanities**

1124 Skinner Building, (301) 405-5689/90

Professor and Chair: Carruthers  
 Professors: Bub, Cherniak, Darden, Greenspan, Horty, Leshner, Levinson, Martin (emeritus), Morris, Pasch (emeritus), Perkins (emeritus), Rey, Suppe (emeritus), Svenonius, Wallace (part-time)  
 Associate Professors: Brown, Kerstein, Lichtenberg, Manekin, Morreau, Odell, Pietroski, Stairs  
 Assistant Professors: Frisch  
 Affiliate Professors: Brush, Hornstein  
 Adjunct Professors: Crocker, Fullinwider, Galston, Luban, Sagoff  
 Adjunct Associate Professor: Wachbroit  
 Adjunct Assistant Professors: Levine, Li, Wasserman

**The Major**

The study of philosophy develops students' logical and expository skills and increases their understanding of the foundations of human knowledge and value. The department views philosophy as an activity rather than a body of doctrine and students can expect to receive intensive training in clear thinking, inventive synthesis, and precise expression. For some, this will serve as preparation for graduate studies in philosophy. However, philosophical skills are useful in professions such as law, medicine, government, business management, and in any field that demands intellectual rigor. The department offers a wide range of courses, including several that deal with the philosophy of various disciplines outside philosophy itself.

**Requirements for Major**

**For students matriculating after June 1, 1991:**

- (1) A total of 36 hours in philosophy, not including PHIL 386
- (2) At least six courses numbered 300 or above, of which at least two must be numbered 400 or above; at least one course in logic at any level; at least two courses numbered 200 or above in the history of pre-twentieth-century philosophy; at least two courses numbered 200 or above in value theory (including aesthetics and political philosophy as well as ethics); at least two courses numbered 200 or above in metaphysics or epistemology (including philosophy of science, mind, and philosophy of religion, as well as metaphysics and theory of knowledge).
- (3) A grade of C or higher in each course counted toward the major requirement.

Fifteen hours of supporting courses are required to be selected in accordance with guidelines available in the Philosophy Department Lounge, Skinner Building, room 1119.

Requirements for the Philosophy major include a minimum of 45 upper-level credits completed and the foreign-language requirement of the College of Arts and Humanities.

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Departmental advising is mandatory for second-semester sophomores and seniors.

Course Code: PHIL

### Citations

#### Citation in Cognitive Science

15 credit hours. PHIL 280 and 170 or 271 or 273 and three courses from approved list of courses.

#### Citation in Philosophy

15 credit hours. PHIL 170, 173, 273 and two courses from approved list of courses.

#### Citation in Philosophy of Science

15 credit hours. PHIL 250 or 256; 170 or 271 or 273; and three courses from approved list of courses.

#### Citation in Value Theory

15 credit hours. PHIL 341 or 346 or 440 or 441 or 442 and four courses from approved list of courses.

Students who fulfill Citation requirements will receive a Citation on the official transcript. Please contact the Director of Undergraduate Studies for more information.

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## PHYSICAL EDUCATION

See Kinesiology elsewhere in this chapter.

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## PHYSICAL SCIENCES PROGRAM

### College of Computer, Mathematical, and Physical Sciences

1120 Physics Building, (301) 405-5949  
[www.physics.umd.edu/studentinfo/psci](http://www.physics.umd.edu/studentinfo/psci)  
E-mail: [phys-ugradinfo@physics.umd.edu](mailto:phys-ugradinfo@physics.umd.edu)

Chair: Einstein  
Astronomy: Deming  
Chemistry: Berkowitz  
Computer Science: Maybury  
Geology: Tomascak  
Engineering: Salamanca-Riba  
Mathematics: Wolfe  
Meteorology: Hudson  
Physics: Einstein  
Advisor: Gleason

### Purpose

The role of the Physical Sciences Program (PSCI) is to develop skills in the areas of analytic thinking, problem solving, understanding systems, and multidisciplinary perspectives. In a world of increasing technical complexity, knowledge of the physical sciences helps individuals to evaluate scientific claims and to make informed decisions about industrial and medical technology, environmental concerns, intellectual property, etc. The Program helps prepare students for a variety of careers requiring a broad scientific background, including meteorology, earth sciences, scientific computation, science writing/journalism, patent law, military/industrial leadership, technical sales, and public policy. The Program can also be useful for those planning science-oriented or technical work in the urban field; Urban Studies courses should be taken as electives. Students contemplating the Program as a basis for preparation for secondary school science teaching are advised to consult the Science Teaching Center staff of the College of Education for additional requirements for teacher certification.

Students should be advised that there are specific requirements to be eligible to take the exam administered by the U.S. Patent and Trademark Office. Students should consult the Requirements Bulletin at the USPTO website: [www.uspto.gov/web/offices/dcom/olia/oed/grb9904.htm](http://www.uspto.gov/web/offices/dcom/olia/oed/grb9904.htm). While Physical Sciences is not one of the listed majors in Category A, PSCI students should be able to qualify under Category B, options 1 or 4.

The Physical Sciences Program consists of a basic set of courses in physics, chemistry and mathematics, followed by a variety of courses chosen from these and related disciplines: astronomy, geology, meteorology, computer science, and the engineering disciplines. Emphasis is placed on a broad program as contrasted with a specialized one.

Students are advised by members of the Physical Sciences Committee. This committee is composed of faculty members from each of the represented disciplines. The selection of a primary advisor depends upon the interest of the students. Usually the student will choose to work with one of the committee members representing the discipline the student has selected as the primary area of concentration to satisfy the distributive requirements of the program. Two secondary area advisors are also required.

### Curriculum

The curriculum of the Physical Sciences Program has a high degree of flexibility to allow selection of courses to meet the interests and goals of the individual student. To earn a Bachelor of Science degree in the Physical Sciences Program, a student must satisfactorily complete the following requirements:

1. Basic Requirements. Courses are required in four foundational disciplines.
  - a) Chemistry: CHEM 103 and 113 (8 credits)
  - b) Mathematics: MATH 140, 141 and one other math course for which MATH 141 is a prerequisite (11 or 12 credits)
  - c) Physics: PHYS 161, 262, 263 (11 credits) or PHYS 171, 174 272, 273, 275, 276 (14 credits). Students desiring a strong background in physics should take the 171-276 sequence, which is required of physics majors and offers much smaller classes than the 161-263 sequence.
  - d) Computer Science: CMSC 104 (4 credits) or CMSC 105(3 credits) or CMSC 106 (4 credits) or ENEE 114 (4 credits) or ENEE 241 (3 credits) or ENES 240 (3 credits) or CMSC 114, CMSC 214, and CMSC 250 (12 credits) or PHYS 165. Students who select Computer Science as an area of concentration must complete CMSC 114, CMSC 214, and CMSC 250.
2. Distributive Requirements. Beyond the basic courses, students complete 24 upper level (300-400) distributive credits. All students must complete 18 of the 24 distributive credits as physical sciences majors. The distributive credits must be divided among three areas of concentration with at least 6 credits in each area. The areas of concentration include the disciplines of chemistry, physics, mathematics (including statistics), astronomy, geology, meteorology, computer science or one of the engineering disciplines. Students who wish to select electrical engineering need the permission of the Assistant Dean in the College of Engineering.
3. General Major Requirements. Programs in the Physical Sciences are usually sequential in nature, and students must be careful to satisfy prerequisites in all cases. Students are advised to develop a physical sciences curriculum with the help of the Physical Sciences advisors as soon as possible, but preferably by the end of the sophomore year.
  - a) All Physical Science students must have a planned program of study approved by the Physical Sciences Committee. In no case shall committee approve a program which has less than 18 credits in the three distributive areas of the Physical Sciences program to be completed, at the time the program is submitted.
  - b) A grade of "C" or better must be earned in all program courses (basic prerequisite and distributive requirement courses).
4. The CORE Liberal Arts and Sciences Studies Program. The requirements of the CORE program are described under the "Academic Regulations and Requirements" section of this catalog. The program requires a total of 43 credits.
5. Elective Requirements. In addition to meeting the requirements stated above, each physical sciences student must plan a sufficient number of elective courses to meet the minimum 120 credits needed for graduation.
6. Students are expected to complete an internship related to their career interests.

Engineering courses used for one of the options must all be from the same department, e.g., all must be ENG courses or a student may use a combination of courses in ENNU and ENMA, which are both offered by the Department of Materials and Nuclear Engineering; courses offered as engineering sciences, ENES, will be considered as a department for these purposes. Selection of ENEE courses is by Permission Only.

Certain courses offered in the fields included in the program are not suitable for Physical Science majors and cannot count as part of the requirements of the program. These include any courses corresponding to a lower level than the basic courses specified above (e.g. MATH 115), some of the special topics courses designed for non-science students, as well as other courses. A listing of "excluded" courses is on the last page.

## Science Journalism Specialization

Science and technology are major and ever-growing forces in our economy, and science related issues are prominent among forefront public-policy issues regularly encountered in the mass media and in the political arena. Thus, there is a great need for journalists with training in science. The Science Journalism specialization offers a broad but rigorous background in science as well as strong journalism training.

1. Basic requirements: same as those stated above.
2. Upper-level Distributive Requirements: Beyond the basic courses, students complete 21 upper level (300-400) distributive credits. All students must complete 18 of the 21 distributive credits as physical sciences majors. The distributive credits must be divided among three areas of concentration with at least 6 credits in each area.

The areas of concentration include the disciplines of chemistry, physics, mathematics (including statistics), astronomy, geology, meteorology, computer science or one of the engineering disciplines. Students who wish to select electrical engineering need the permission of the Assistant Dean in the School of Engineering.

3. In addition, students taking the Science Journalism specialization are required to complete the following lower- and upper-level courses in Journalism: JOUR 201, JOUR 202, JOUR 300, JOUR 320, JOUR 380, JOUR 396, AND JOUR 400. (Alternatively, students interested in broadcast journalism could substitute JOUR 360 for JOUR 320.)
4. The Committee believes that good preparation for Science Journalism in today's world should include a substantial exposure to introductory biology, such as provided in BSCI 105-106; thus, these two courses are strongly recommended. Students should consult early with the PSCI advisor to set up a schedule of courses that includes BSCI 105-106 in a way that proceeds efficiently through the lower-level PSCI requirements while avoiding a semester with 15 credits of science courses or with several courses having time consuming labs and computer projects.
5. The regular University requirements for graduation stated above apply.

## Honors Program

The Physical Sciences Honors Program offers students the opportunity for research and independent study, and will lead to a BS degree with Honors or High Honors. The requirements are:

- a) Overall grade point average of 3.0 or better.
- b) Physical Sciences courses grade point average of 3.2 or better.
- c) An independent study course in the Physical Sciences Program - three credit minimum which may be distributed over two semesters (e.g. Astronomy 399 or 498, Chemistry 399, Computer Science 498, Geology 499, Mathematics 498, Meteorology 499 and Physics 399 or 499B).
- d) An honors thesis summarizing independent research submitted to the Physical Sciences Committee.
- e) An oral examination concerning thesis and related subjects. The thesis advisor and two other faculty members (at least one a member of the Physical Sciences Committee) will comprise the examining committee.

## Selection of College

Students may elect to receive their degrees from either the College of Computer, Mathematical and Physical Sciences, the College of Agriculture and Natural Resources, or the College of Life Sciences. College of CMPS students have no further requirements to fulfill beyond those stated here plus the General Education Requirements. Agriculture and Natural Resources, and Life Sciences students must also satisfy their respective College requirements.

## Approval of Program Plans

All students must submit a program plan outlining what courses they plan to take to complete their program. These should include both the core courses and the distributive 300-400 level courses of 24 credits beyond the core.

In preparing such a program plan, students should keep in mind that the Physical Sciences Committee will look for courses that will support the purpose or goals of the program. These plans should be submitted as early as possible, normally no later than the beginning of the junior year. This is important because it will provide students with sufficient time to plan an appropriate program. The program plans will be approved by the Physical Sciences Committee and filed in the Dean's Office. Any changes to the plan must be approved in writing by the student's advisor and the Chairperson.

Students planning to use any of the special topics, or special programs topics courses (including PHYS 318) as part of their Physical Sciences requirement must obtain written approval to do so. Many of these special topics courses are intended for non-science students and are not suitable for Physical Sciences majors.

In preparing a program plan, students should keep in mind that certain other courses are also not considered suitable for a Physical Sciences major. In particular, courses at lower levels than the core courses designed primarily for non-sciences students may be disallowed. Contact the Program Advisor for specific details.

## PHYSICS (PHYS)

**College of Computer, Mathematical, and Physical Sciences**  
1120 Physics Building, (301) 405-5979  
[www.physics.umd.edu](http://www.physics.umd.edu)

Professor and Chair: Goodman\*  
Professors and Associate Chairs: Baden, Chant, Wellstood  
Professors Emeriti: Banerjee, Beise, C. Y. Chang, Currie, DeSilva, Falk, Ferrell, Glick, Glover, Gluckstern, Griem, Holmgren, Kacser (Associate Professor Emeritus), Layman, Misner, Prange, Richard, Sucher, Wellstood, Woo  
Chancellor Emeritus: Langenberg, Toll  
President Emeritus: Gluckstern  
Distinguished University Professors: Das Sarma, Fisher, Gloeckler, Ott, Phillips\*\*\*, Sagdeev, Sreenivasen, Webb (Alford Ward Chair), Williams\*\*, Yorke  
Professors: Alley, Anderson, Anlage, Antonsen, Beise, Bhagat, Boyd, Brill, C. C. Chang, Chant, Chen, Cohen, Dorfman\*, Dragt\*, Drake, Drew, Einstein, Gates\* (Toll Chair), Goldenbaum, Goodman\*, Greenberg, Greene, Griffin, Hadley, Hamilton, Hassam, Hu, Jacobson, Jawahery, Ji, Kelly, Kim, Kirkpatrick, Korenman, Langenberg, Liu, Lobb\*, Mason, Mohapatra\*, Paik, Papadopoulos, Park, Pati, Ramesh, Redish, Roos, Roy, Skuja, Wallace, Wellstood  
Professor (part-time): Z. Slawsky  
Associate Professors: Baden, Ellis, Eno, Hammer, Lathrop, Sullivan, Yakovenko  
Assistant Professors: Becker, Dorland, Fuhrer, Losert, Luty, Roberts  
Affiliated Professors: Hill, Milchberg, Panagiotopoulos, Takeuchi  
Adjunct Professors: Boldt, Lynn, Mather  
Lecturers: Rapport, Restorff  
\*Distinguished Scholar-Teacher  
\*\* Distinguished Faculty Research Fellow  
\*\*\*Nobel Laureate

The Physics Program includes a broad range of undergraduate courses designed to satisfy the needs of almost every student, from the advanced physics major to the person taking a single introductory physics course. In addition, there are various opportunities for personally-directed studies between student and professor, and for undergraduate research. For further information consult "Undergraduate Study in Physics" available from the department. Students majoring in Physics can follow either the Professional Physics area of concentration, the Meteorology Physics area of concentration, or the Education Physics area of concentration. A grade of C or better is required in all courses required for the major.

## The Major

### Courses required for Physics Major:

<b>Lower-level courses for all areas of concentration</b>	<b>Credit Hours</b>
PHYS 171—Introductory Physics: Mechanics .....	3
PHYS 174—Physics Laboratory Introduction .....	1
PHYS 272—Introductory Physics: Fields .....	3
PHYS 273—Introductory Physics: Waves .....	3
PHYS 275—Experimental Physics I: Mechanics, Heat, and Fields .....	2
PHYS 276—Experimental Physics II: Electricity and Magnetism .....	2
MATH 140—Calculus I .....	4
MATH 141—Calculus II .....	4

## 140 Plant Biology

MATH 241—Calculus III .....	4
MATH 246—Differential Equations .....	3
MATH 240—Linear Algebra .....	4

### Upper-level courses for Professional Physics area of concentration

PHYS 374—Intermediate Theoretical Methods .....	4
PHYS 375—Experimental Physics III: Electromagnetic Waves, Optics, and Modern Physics .....	3
PHYS 401—Quantum Physics I .....	4
PHYS 402—Quantum Physics II .....	4
PHYS 404—Introduction to Statistical Mechanics.....	3
PHYS 405—Advanced Experiments .....	3
PHYS 410—Classical Mechanics.....	4
PHYS 411—Intermediate Electricity and Magnetism.....	4

### Upper-level and supporting courses for Meteorology Physics area of concentration

CHEM 103—General Chemistry I .....	4
CHEM 113—General Chemistry II .....	4
MATH 462—Partial Differential Equations for Scientists and Engineers .....	3
METO 431—Meteorology for Scientists and Engineers I .....	3
METO 432—Meteorology for Scientists and Engineers II .....	3
METO 434—Air Pollution .....	3
PHYS 375—Experimental Physics III: Electromagnetic Waves, Optics .....	3
PHYS 401—Quantum Physics I .....	4
PHYS 402—Quantum Physics II .....	4
PHYS 404—Introduction to Statistical Thermodynamics .....	3

[In the Meteorology Physics area of concentration the Physics 401-402 sequence may be replaced by PHYS 420—Principles of Modern Physics (3) and PHYS 406—Optics (3)]

### Upper-level and supporting courses for Education Physics area of concentration

EDPL 301—Foundations of Education.....	3
EDHD 413—Adolescent Development.....	3
EDHD 426—Cognitive and Motivational Basis of Reading: Reading in Content Area I .....	3
EDCI 463—Teaching Reading in Content Area II .....	3
PHYS 374—Intermediate Theoretical Methods .....	4
PHYS 411—Intermediate Electricity and Magnetism.....	4
PHYS 401—Quantum Physics I .....	4
PHYS 375—Experimental Physics III: Electromagnetic Waves, Optics .....	3

[In the Education Physics area of concentration: EDPL 301 may be replaced by EDPL 401—Educational Technology, Policy and Social Change (3). PHYS 401 may be replaced by PHYS 420—Principles of Modern Physics (3). PHYS 375 may be replaced by one additional non-seminar 400-level approved Physics course of 3-4 credits.]

Students who are considering pursuing the Education Physics area of concentration are encouraged to enroll in EDCI 280—Introduction to Teaching, for a survey of education and teaching. The Education Physics area of concentration is designed to accommodate students obtaining a teaching certificate through the College of Education. However, completing all the courses in the Education Physics area of concentration does not in itself satisfy all requirements for obtaining a teaching certificate. Students pursuing the Education Physics area of concentration who want to also obtain a teaching certificate in secondary education must first apply and be admitted to the Secondary Education Program in the College of Education and then complete additional courses in that program.

Students planning to double major (or seek a double degree) in Physics and Astronomy should note that this combination does not automatically satisfy CORE Advanced Studies. These students must complete CORE Advanced Studies by taking courses from departments other than Physics and Astronomy.

## Honors

The Physics Honors Program offers to students of good ability and strong interest in physics a greater flexibility in their academic programs. To receive a citation of “with honors in physics” the student must pass a comprehensive examination in his or her senior year. To receive a citation of “with high honors in physics” he or she must also complete a senior thesis.

Course Code: PHYS

## Citation in Physics

The Citation in Physics is intended for students who desire a rigorous foundation in physics but choose not to complete the entire physics major. The citation begins with a set of three introductory courses (9 credits) in mechanics and relativity (PHYS 161 or PHYS 171), electromagnetic fields (PHYS 260 or PHYS 272), and waves (PHYS 270 or PHYS 273). As part of this introduction to Physics, the citation also requires an introductory laboratory (PHYS 174, PHYS 261, or PHYS 271) involving techniques of data gathering and analysis. To obtain a deeper understanding of physics, the citation requires two additional upper-level courses (3-4 credits each), which students can select from: intermediate theoretical methods (PHYS 374), optics lab (PHYS 375), quantum physics (PHYS 401, 402), statistical mechanics (PHYS 404), classical mechanics (PHYS 410), electricity and magnetism (PHYS 411), modern optics (PHYS 465), computational physics (PHYS 474), or other upper level Physics courses with approval from the Department’s Undergraduate Director and Faculty Citation Advisor.

Students interested in the Physics Citation should contact the Faculty Citation Advisor, Professor Theodore Jacobson (jacobson@physics.umd.edu), or the Undergraduate Advisor, Thomas Gleason (tgleason@physics.umd.edu).

This Citation is open to all majors, with the exception of Physics majors and Astronomy majors. Physics majors are not eligible for the Citation since College guidelines forbid students from obtaining a Citation in a program they are majoring in. Astronomy majors will not be eligible for this Citation since the Citation requirements will overlap significantly with Astronomy major requirements. Astronomy majors desiring to complete more physics courses than required by their department are encouraged to consider a double major in Astronomy and Physics.

## PLANT BIOLOGY

Departments in the College of Life Sciences have been reorganized. Courses in plant biology are now offered by the Department of Cell Biology and Molecular Genetics.

## PSYCHOLOGY (PSYC)

### College of Behavioral and Social Sciences

1107 Biology-Psychology Building, (301) 405-5866

[www.bsos.umd.edu/psyc/](http://www.bsos.umd.edu/psyc/)

Professor and Chair: Hall

Professor, Associate Chair and Director of Graduate Studies: Sigall  
Professors: Anderson (emerita), Beidel, Brauth, Cassidy, Collewijn\*\*, Dooling, Fein\*, Fox\*, Gelso, Goldstein, Gollub (emeritus), Hill, Hodos, Horton, Kowler\*\*, Kruglanski, Lissitz\*, Locke\*, Magoon (emeritus), Martin (retired), McIntire (emeritus), J. Mills, Moss, Nelson, Popper\*, Rosenfeld\*, Schneider, Scholnick, Smith, Stangor, Steinman, Sternheim, Suomi\*\*, Torney-Purta\*, Turner, Tyler (emeritus), Waldrop (emeritus), Wallsten, Yeni-Komshian (emerita)\*

Associate Professors: Blanchard, R. Brown, Coursey, Freeman (emeritus)\*, Gelfand, Hanges, Jekka\*, K. Klein, Larkin (retired), Leone\*, Murnane, Norman, O’Brien, O’Grady, Schneiderman\*, Steele, Yager

Assistant Professors: J. Carter\*\*, Castles\*\*, Chronis, Dougherty, Fago\*\*, Hazel-Johnson\*\*, Huber, Lejuez, Marx\*\*, Miller\*\*, Pompilo\*\*, Reibsame\*, Royalty\*\*, Spiefel\*\*, Sprei\*\*, Thompson\*\*, Tipton\*, Troyer, Wine\*\*, Zamostny\*

\*Affiliate

\*\*Adjunct

## The Major

Psychology can be classified as a biological science (Bachelor of Science degree) and a social science (Bachelor of Arts degree) and the department offers academic programs related to both of these fields. The undergraduate curriculum in psychology is an introduction to the methods by which the behavior of humans and other organisms is studied, and to the biological conditions and social factors that influence such behavior. In addition, the undergraduate program is arranged to provide opportunities for learning that will equip qualified students to pursue further study of psychology and related fields in graduate and professional schools. Students who are interested in the biological aspects of behavior tend to choose a program leading to the Bachelor of Science degree, while those interested primarily in the impact of social factors on behavior tend to choose the Bachelor of Arts degree. The choice of program is made in consultation with an academic adviser.

## Requirements for Major

All students must take at least 35 credits in Psychology including 14 credits at the 400-level. PSYC 386, 478 and 479 may not be included in those 35 required credits. The required courses include PSYC 100, 200 and two laboratory courses chosen from PSYC 401, 410, 420, 433, 440, and 450. In order to assure breadth of coverage, Psychology courses have been divided into four areas. The 35 credit total must include at least two courses from two of the four areas and at least one course from each of the remaining areas. The areas and courses are:

Area I: 206, 301, 310, 401, 402, 403, 404, 410, 415;  
 Area II: 221, 341, 420, 421, 423, 424, 440, 442, 443, 444;  
 Area III: 235, 332, 334, 337, 353, 354, 355, 356, 357, 432, 433, 434, 435, 436, 455, 456, 457, 458;  
 Area IV: 336, 361, 450, 451, 452, 460, 462, 463, 464, 465, 466

In addition, all students must complete (a) either MATH 111, or MATH 140 or MATH 220; (b) one of the following laboratory courses: BSCI 105\*, BSCI 106, CHEM 103, or PHYS 121.

\*Note BSCI 103, formally BIOL 101/102, does not satisfy the Lab Science requirement for Psychology. If you have completed BSCI 103, you must take BSCI 106, CHEM 103, or PHYS 121.

Students pursuing a Bachelor of Science degree must complete a minimum of 5 courses/17 credits in mathematics and science. At least three courses must be advanced and at least two courses must contain a lab. The 5 course/17 credits must be completed with at least a 2.0 average. MATH 111, MATH 140, MATH 220, BSCI 105, BSCI 106, CHEM 103 and PHYS 121 may be used to satisfy the requirement for the B.S. degree. Students should consult the current Psychology Undergraduate Program Guide for a list of approved advanced Math-Science Courses.

A grade of C or better must be earned in all 35 credits of psychology courses used for the major and all credits used to meet the Math-Science supporting course sequence. No course may be used as a prerequisite unless a grade of C is earned in that course prior to its use as a prerequisite. The prerequisite for any required laboratory course is completion of PSYC 200 and completion of the Math-Science supporting course sequence.

## Admission to the Department of Psychology

In accordance with University policy, the Department of Psychology has been designated a Limited Enrollment Program (LEP). All first-time freshman admits who request Psychology will be directly admitted into the major. Other first-time freshman that wish to declare Psychology as a major prior to the end of the schedule adjustment period of the second semester in residence will be allowed to do so.

In order to remain a Psychology major, newly admitted freshman will be required to meet an academic performance review on or before the end of the semester in which they attain {pass} 45 University of Maryland credits. This standard includes:

- Completion of PSYC 100 with a grade of B or better, or, if a student enters with AP or IB credit for PSYC 100, this requirement is replaced by completion of PSYC 221 with a grade of B or better;
- Completion of MATH 111, 140 or 220 with a grade of C or better;
- Completion of BSCI 105, BSCI 106, CHEM 103 or PHYS 121 with a grade of C or better; and
- A minimum cumulative GPA of 2.00.

All other students, including both internal and external transfer students, will not be admitted to the program until they have met the following requirements:

- Completion of PSYC 100 with a grade of B or better, or, if a student enters with AP or IB credit for PSYC 100, this requirement is replaced by completion of PSYC 221 with a grade of B or better;
- Completion of MATH 111, 140 or 220 with a grade of C or better;
- Completion of BSCI 105, BSCI 106, CHEM 103 or PHYS 121 with a grade of C or better; and
- A minimum cumulative GPA based on all previous college-level coursework of 2.70 or higher.

As is the general case for all Limited Enrollment Programs:

- Only one "gateway" or performance review course may be repeated to earn the required grade and that course may be repeated only once;
- Students may apply only once to an LEP, so that students who are directly admitted and fail to meet the performance review criteria will be dismissed from the major and may not reapply; and
- Students must maintain a cumulative GPA of 2.00. Failure to do so will result in dismissal from the major.

The above requirements will go into place for all new students admitted to the University or any Maryland community college after May 2001. They will apply to all students after May 2003, regardless of the date of first admission.

Any student denied admission or dismissed from the major may appeal. Dismissed students appeal directly to the Director of Undergraduate Studies. Internal transfer students appeal to the Office of the Dean for Behavioral and Social Sciences. External transfer students appeal to the Office of Admissions.

## Advising

All students can be advised on choice of major, career decisions, research opportunities, graduate school applications, USP/CORE requirements, major requirements, scheduling, and other academic concerns. Advising appointments must be made in person in the undergraduate office, 1107 Biology-Psychology Building. A program guide is available. Call the undergraduate office, (301) 405-5866, or contact Dr. Charles Sternheim, Director of Undergraduate Studies, (301) 405-5241 or by E-mail at csterheim@psyc.umd.edu for more information.

## Student Organizations

Information about the Psychology Honorary Society (Psi Chi) and the Black Psychology Society is posted outside the Undergraduate Psychology Office, 1107 Biology-Psychology Building. All students are welcome to attend the workshops sponsored by these organizations on topics of special interest to undergraduates.

## Fieldwork

The department offers a program of fieldwork coordinated with a seminar through PSYC 386. Dr. Robert Coursey, (301) 405-5904, usually administers the course.

## Honors

The Psychology Honors Program offers the exceptional student a series of seminars and the opportunity to do independent research under a faculty mentor. To be admitted to the program students must file a formal application and be interviewed by the Director of the Program, Dr. William S. Hall, 1147A Biology-Psychology Building, (301) 405-5788. Students are eligible to enter the program if they are in their fourth to sixth semester of undergraduate work and have completed three courses in Psychology including PSYC 200, and have a 3.3 GPA overall and in Psychology. Students in the University Honors Program may be admitted in their third semester providing that they have (a) earned an A in PSYC 100 or 100H, (b) finished the mathematics prerequisite for PSYC 200 and (c) have an overall GPA and Psychology GPA of at least 3.3. Since there are different graduation requirements including an undergraduate thesis and supporting math and science courses, the student is urged to consult the Guide to the Honors Program in Psychology available in the undergraduate office.

Course Code: PSYC

## PUBLIC AND COMMUNITY HEALTH (HLTH)

### College of Health and Human Performance

2387 Health and Human Performances Building, (301) 405-2463  
[www.hhp.umd.edu/dpch](http://www.hhp.umd.edu/dpch)

Professor and Chair: Gold  
 Associate Chair: Sawyer  
 Professors: Beck, Burt, Feldman, Gold, Greenberg, Leviton, Wang, Wilson  
 Associate Professors: Boekeloo, Desmond, Meiners, Sawyer  
 Assistant Professors: Howard, Thompson  
 Instructors: Hyde, Schiraldi

## 142 Romance Languages Program

### The Major

Students graduate with a degree in Community Health Education, which prepares students for entry-level health education positions in community settings such as health associations, worksite health promotion programs, or other health agencies.

### Requirements for Major

Students must earn a grade of C or better in courses applied toward the major.

### Health Education Major

#### Required Health Education Courses (16 hours)

HLTH 105—The Science and Theory of Health .....	(2)
HLTH 140—Personal and Community Health .....	(3)
HLTH 150—First Aid and Emergency Medical Services .....	(2)
HLTH 230—Introduction to Health Behavior* .....	(3)
HLTH 390—Organization & Administration of Health Programs .....	(3)
HLTH 420—Methods and Materials in Health Education .....	(3)

#### Required Health Electives (any five) (15 hours)

HLTH 106—Drug Use and Abuse .....	(3)
HLTH 285—Controlling Stress and Tension* .....	(3)
HLTH 377—Human Sexuality .....	(3)
HLTH 450—Health of Children and Youth .....	(3)
HLTH 471—Women’s Health .....	(3)
HLTH 476—Death Education .....	(3)
HLTH 498X—AIDS Education .....	(3)
NFSC 100—Elements of Nutrition .....	(3)

#### Supportive Courses (all) (36 hours)

CHEM 121—Chemistry in Modern Life .....	(3)
BSCI 105—Principles of Biology I .....	(4)
BSCI 201—Human Anatomy and Physiology I*+ .....	(4)
BSCI 202—Human Anatomy and Physiology II*+ .....	(4)
PHIL 140—Contemporary Moral Issues + .....	(3)
PSYC 100 —Introduction to Psychology*+ .....	(3)
PSYC 221—Social Psychology .....	(3)
SOCY100—Introduction to Sociology*+ .....	(3)
HLTH 371—Communicating Health and Safety .....	(3)
EDHD 340—Human Development Aspects of the Helping Relationship ...	(3)
EDCP 317—Introduction to Leadership.....	(3)

#### Professional Preparation

##### Community Health Education (35 hours)

BSCI 122—Microbes and Society .....	(4)
HLTH 391—Introduction to Community Health .....	(3)
HLTH 430—Community Health in the Workplace .....	(3)
HLTH 437—Consumer Behavior.....	(3)
EDMS 451—Introduction to Educational Statistics.....	(3)
HLTH 490—Principles of Community Health .....	(3)
FMST 431—Family Crisis and Intervention .....	(3)

##### Electives .....

HLTH 491—Community Health Internship** .....	(12)
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### Advising

Advising is mandatory. Community Health Advisor: David H. Hyde, 2387 HLHP Building, (301) 405-2523 or (301) 405-2463.

### Student Honors Organization

**Eta Sigma Gamma.** The Epsilon chapter was established at the University of Maryland in May 1969. This professional honorary organization for health educators was established to promote scholarship and community service for health majors at both the graduate and undergraduate levels. Students may apply after two consecutive semesters with a 2.75 cumulative grade point average.

Course Code: HLTH

## ROMANCE LANGUAGES PROGRAM

### College of Arts and Humanities

3106 Jimenez Hall, (301) 405-4024

Advisory Committee: Falvo (Italian), Little (Spanish), Campagne (French)

The Romance Languages Program is intended for students who wish to major in more than one Romance language.

### The Major

Students selecting this major must take a total of 45 credits selected from courses in two of the three components listed below: French, Italian and Spanish. The first four courses listed under each group are required for that particular language component; exceptions or substitutions may be made only with the approval of the student’s adviser in consultation with the Romance Languages Advisory Committee. To achieve the total of 45 credits, 21 credits are taken in each of the two languages, as specified, and three additional credits are taken at the 400-level in either of the languages chosen. Literature or civilization courses may not be taken in translation.

There are no requirements for support courses for the Romance Languages major.

No grade lower than C may be used toward the major. Students who wish to apply for Teacher’s Certification should consult the College of Education.

### Requirements for Each Language

**French**—204, 301, 351, 352; one additional language course at the 300- or 400-level; two additional literature or civilization courses at the 400-level. **Italian**—204, 211, 301, 350; three additional literature or civilization courses at the 400-level. **Spanish**—207, 301, 321-322 or 323-324; one additional language course at the 300- or 400-level; two additional literature or civilization courses at the 400-level.

## RUSSIAN AREA STUDIES PROGRAM

### College of Arts and Humanities

2115 Francis Scott Key Hall, (301) 405-4295

Director: Michael David-Fox

Professors: Mansbach (Art History and Archaeology), Brecht (Asian and East European), Tismaneanu (Government and Politics), Lampe (History), Murrell (Economics), Robinson (Sociology)

Associate Professors: Gor, Hitchcock, Lekic, and Martin (Asian and East European), Kaminski (Government and Politics), M. David-Fox (History), Schuler (Theatre)

Assistant Professors: Papazian (Asian and East European), K. David-Fox (History), Howard (Government and Politics)

**Departmental advising is mandatory for second-semester sophomores**

### The Major

The Russian Area Studies Program offers courses leading to a Bachelor of Arts in Russian Studies. Students in the program study Russian, Eurasian, and East European culture as broadly as possible, striving to comprehend it in all its aspects rather than focusing their attention on a single element of human behavior. It is hoped that insights into the region’s ways of life will be valuable not only as such but as a means to deepen students’ awareness of their own society and of themselves.

Course offerings are in a range of departments, including Asian and East European Languages and Cultures, Government and Politics, History, Economics, Geography, Philosophy, and Sociology. Students may plan their curriculum so as to emphasize any one of these disciplines, thus preparing for graduate work either in the Russian area or in the discipline.

Changes in requirements are under review. Students should consult the director for updated information.

Requirements for the Russian Area Studies Program major include the College of Arts and Humanities requirement of 45 upper-level credits completed. The College foreign-language requirement will be automatically fulfilled in the process of taking the courses in Russian.

Students must complete 24 hours in Russian language and literature courses selected from among the following equivalent courses: RUSS 101, 102, 201, 202, 301, 302, 303, 321, 322, 401, 402, 403, and 404. In addition, students must complete 24 hours in Russian area courses at the 300-level or above. These 24 hours must be taken in at least five different departments, if appropriate courses are available, and may include language-literature courses beyond the required 24 hours.

It is recommended but not required that the student who plans on doing graduate work complete at least 18 hours at the 300-level or above (which may include courses applicable to the Russian Area program) in one of the above-mentioned departments. It is also recommended that students who plan on doing graduate work in the social sciences, government and politics, economics, geography, and sociology take at least two courses in statistical methods.

The student's adviser will be the program director or the designate. The student must receive a grade of C or better in all the above-mentioned required courses.

In addition to the courses in Russian language, literature, and culture taught in the Department of Asian and East European Languages and Cultures, the following Russian Area courses are offered. Students should check the Schedule of Classes each semester.

ARTH 488C—Modernism in Central and Eastern Europe  
 ECON 315—Economic Development of Underdeveloped Areas  
 ECON 380—Comparative Economic Systems  
 GEOG 325—Geography of the Soviet Union  
 GVPT 359—East European Politics and Societies; Rise and Fall of Communism  
 GVPT 409—International Relations and World Politics: Developments in the Post-Communist World  
 GVPT 445—Russian Political Thought  
 GVPT 451—Foreign Policy of Russia and the States of the Former Soviet Union  
 GVPT 459A—Soviet and Post-Soviet Politics  
 GVPT 481—Government of Russia  
 HIST 340—Nationalism and Communism in Eastern Europe  
 HIST 344—Revolutionary Russia  
 HIST 424—Early Russia  
 HIST 425—Imperial Russia  
 HIST 442—Twentieth-Century Russia  
 HIST 443—Modern Balkan History  
 PHIL 328—Studies in Philosophy: Marxist Philosophy  
 SOCY 474—Post Soviet Societies

The various cooperating departments also offer special courses in the Russian, East European, and Eurasian field. HIST 237, Russian Civilization, is recommended as a general introduction to the program but does not count toward the fulfillment of the program's requirements.

## RUSSIAN LANGUAGE AND LITERATURE

For information, see listing under Department of Asian and East European Languages and Cultures.

## SOCIOLOGY (SOCY)

### College of Behavioral and Social Sciences

2108 Art-Sociology Building, 405-6389

[www.bsos.umd.edu/socy](http://www.bsos.umd.edu/socy)

Professor and Chair: Falk

Professors: Bianchi, Clignet (emeritus), Dager (emeritus), Dill\* (Women's Studies), Falk, Fink\* (Speech Communication), Finsterbusch, Gurevitch\* (Journalism), Hage+ (emeritus), Hamilton, Hampton\* (Family Studies), Kammeyer (emeritus), Lejins (emeritus), Levy\* (Journalism), Meeker, H. Presser, S. Presser, Ritzer+, Robinson, D. Segal+, M. Segal+, Vanneman, Wilson\* (Health Education, Center on Aging)

Associate Professors: Dance, Desai, Favero\* (AES), Henkel (emeritus), Hirzel (emeritus), J. Hunt, L. Hunt, Kahn, Korzeniewicz, Landry, Lengermann, Milkie, Neustadt, Pease

Assistant Professors: DeRose, Kestnbaum, Martin

Lecturer: Moghadam

†Distinguished Scholar Teacher

\*Joint Appointment with unit indicated.

## The Major

Sociology is the scientific study of society and its institutions, organizations, and groups. By observing the broad range of activities in society, and exploring topics such as social class, race, gender, deviance, family, religion, the work place, and demographic trends, sociologists provide important information and perspectives on our social order and the causes and impacts of social change. Sociology provides important information useful both to personal life and public policy decisions. Sociology is among the broadest of the social sciences and is characterized by considerable pluralism in theoretical and methodological approaches, substantive specializations, and in units of analysis.

Students major in Sociology for a variety of reasons. Some emphasize sociology's relevance to understanding a broad range of social issues that interest them for intellectual curiosity, personal life relevance, or usefulness for ameliorative social change efforts. Other majors emphasize acquisition of sociological knowledge and skills useful in a variety of career paths where understanding societal problems and trends, group dynamics, and personnel issues are critical. For a small core of majors, the purpose of the undergraduate program is preparation and training for admissions to graduate programs and eventual careers as sociologists in teaching, research and/or policy development. Other majors use sociology as a basis for graduate study in related fields, including law, social work, public policy, and human resource management.

## Goals and Objectives of the Undergraduate Sociology Program

The overall goals of the program are:

- To provide meaningful and challenging courses within the University CORE program
- To provide meaningful and challenging courses as electives for non-majors
- To provide a coherent program of courses for Sociology majors which enables majors to attain:
  - a) general sociological knowledge and understanding of our society;
  - b) sociological knowledge and skills relevant to a variety of career paths,
  - c) sociological knowledge and skills relevant to application to and success within competitive sociology graduate programs and careers; and
- To provide a Sociology Honors component for selected students who have the capability and motivation to work at the most challenging level.

The program attempts to provide students the opportunity and ability to meet the following objectives:

- To read and think critically and to assess information about our society in terms of sociological concepts and a social science model of argument
- To understand the key questions addressed by the discipline, and to be able to identify both similarities and contrasts with other disciplines
- To be familiar with basic sociological information about our society and its place in the international order
- To be acquainted with the role of theory in the construction of sociological inquiry; for majors this entails knowing the central ideas of major classical and contemporary theorists
- To understand the social science model of evidence and argument: for majors this entails familiarity with basic social statistics techniques, basic methods of data collection, basic techniques of organizing and presenting information, and the ability to carry out a small research project.

## Requirements for Major

As part of the 120 credits and other requirements for a Bachelor of Arts degree, sociology majors must complete a minimum of 38 credits in Sociology and 12 credits in supporting courses outside of Sociology. All these credits must be completed with a minimum grade of C or better in each course. The 38 credits in Sociology must include the following:

- 1) four basic courses required of all majors: SOCY100 (3); SOCY201 (4); SOCY202 (4); and SOCY203 (3)
- 2) a breadth requirement consisting of one course from three of the following concentration areas:
  - a) Family and Demography: SOCY410; SOCY443
  - b) Organizations and Institutions: SOCY431; SOCY443; SOCY460; SOCY464; SOCY466
  - c) Social Psychology: SOCY230; SOCY430
  - d) Stratification and Inequality: SOCY441
- 3) a depth requirement consisting of at least three courses (including one required) in any one of the following concentration areas:

## 144 Spanish and Portuguese Languages and Literature

- a) Family and Demography: SOCY410 (required); SOCY411; 412; 418\*; 442; 443; 444; 461
- b) Organizations and Institutions: SOCY431 (required); SOCY425; 426; 438\*; 443; 456; 457; 460; 462; 463; 464; 465; 466; 467
- c) Social Psychology: SOCY230 (required); SOCY402 or 404; 430; 440; 447; 448\*; 450; 463
- d) Stratification and Inequality: SOCY441 (required); SOCY325; 421; 422; 424; 425; 428\*; 442; 462; 467
- 4) an intermediate methods course or research course requirement, consisting of one course to be selected from a list maintained by the Sociology Undergraduate Advising Office.
- 5) elective courses in sociology, sufficient to fill out the required minimum of 38 credits in sociology; these may be selected from any of the sociology courses.

The four supporting courses outside of sociology (12 credits) must be linked to the area of concentration selected to meet the depth requirement and must be selected from a list of recommended supporting courses maintained by the Sociology Undergraduate Advising Office.

Students should note the following in reference to Sociology requirements:

- a) SOCY201 has a pre-requisite of Math 111 or higher;
- b) some of the courses necessary to fulfill depth requirements and/or the methods/research course requirement may have pre-requisites such as SOCY201, 202, and 203;
- c) it is permissible to count one course as fulfilling more than one type of requirement, e.g. a course can be counted towards meeting a breadth requirement and a depth requirement, or a course might be counted towards a depth requirement while simultaneously fulfilling the methods/research course requirement;
- d) special topics courses (indicated with an \* in the above lists) may be repeatable for credit if its content differs from when previously taken;
- e) SOCY498 courses may be used to fulfill depth requirements for particular concentration areas when so designated by the Undergraduate Sociology Office; the Sociology Undergraduate Office maintains current lists of special topics courses (SOCY498) that fulfill depth requirements; and
- f) each course counted as meeting sociology or supporting course requirements must be passed with a grade of C or better.

### Honors Program in Sociology

The Sociology Honors Program seeks to encourage and recognize superior scholarship by providing an opportunity for interested, capable, and energetic undergraduate students to engage in study in an area of the student's interest under the close supervision of a faculty mentor. The honors program is based upon tutorial study and independent research.

Students who have an overall cumulative grade point average of at least 3.3, a cumulative average of 3.5 in Sociology courses, and who have taken at least nine credits in Sociology may apply. Transfer students with equivalent academic records at other accredited institutions are also eligible. Admission to the program will be based upon academic performance and the judgment of the Undergraduate Committee whether the applicant has sufficient maturity and interest to complete successfully the requirements for graduation with Honors. Further information on the honors program is available from the Sociology Undergraduate Office.

### Advising

Regular advising is strongly recommended for all majors. Advising is particularly important for those majors who are considering going on to graduate school. Majors are reminded of the importance of taking the four basic required courses (SOCY 100, 201, 202, 203) as soon as possible because these are prerequisites for some upper level work. Further information on course work, internships, the department honors program, careers, and other topics may be obtained from the Sociology Undergraduate Advisor, 2108 Art/Sociology Building, 405-6389.

### Internship Opportunities

Although internships are not a requirement for a major, students may wish to consider the internship program offered by the department or through the Experiential Learning Office located in Hornbake Library. Majors may receive up to six credits in SOCY386 when an internship/volunteer position is combined with an academic project. A prerequisite of 12 credit hours in Sociology course work is required.

### Student Organizations

The Sociology Collective, open to all Sociology majors, is organized by a group of interested undergraduates to fill student needs within the Sociology community. The Collective provides information about topics of interest, including department activities, career planning, and relevant changes within the university, and strives to enhance the sense of community within the department. Representatives of the Collective participate in many faculty committees within the department and thereby provide the undergraduate perspective on policy issues.

Alpha Kappa Delta is the National Honor Society for Sociology majors. Membership is based on Sociology GPA (3.0 minimum) and overall GPA (3.0 minimum). Students may apply after they have completed 18 hours of Sociology course work. This organization's activities focus on providing tutoring services for undergraduates in core courses.

## SPANISH AND PORTUGUESE LANGUAGES AND LITERATURE (SPAN, PORT)

### College of Arts and Humanities

2215 Jimenez Hall, (301) 405-6441  
[www.languages.umd.edu/SpanishPortugese](http://www.languages.umd.edu/SpanishPortugese)

Professor and Acting Chair: Cypress

Professor emerita: Nemes

Professors: Aguilar-Mora, Cypress, Harrison, Pacheco<sup>††</sup>, Sosnowski

Associate Professors: Benito-Vessels, Igel, Lavine, Naharro-Calderón, Peres

Assistant Professors: Bouvier, Cabal-Krastel, Lacorte, Rodríguez, Sánchez

Instructors: Canabal, Little, Roman

<sup>††</sup>Distinguished University Professor

### The Majors

Requirements for the Spanish and Portuguese majors include the College of Arts and Humanities requirement of 45 upper-level credits completed. The College foreign-language requirement will be automatically fulfilled in the process of taking language major courses.

Undergraduate majors can benefit from a wide range of courses in Spanish and Latin American literature and civilization; technical courses in translation, linguistics, and commercial uses of Spanish. Area studies programs are also available in conjunction with other disciplines to provide the student with a solid knowledge of the Spanish and Latin American worlds.

A grade of at least C is required in all major and supporting area courses.

Departmental advising is mandatory for second-semester sophomores and seniors.

Changes in requirements are under review.

### Language and Literature Major

Courses: SPAN 207, 221, 301-302, 311 or 312, 321-322 or 323-324, 325-326 or 346-347; plus four courses in literature at the 400-level; one course may be taken in Luzo-Brazilian literature, for a total of 39 credits. Nine credits of supporting courses, six of which must be at the 300- or 400-level in a single area other than Spanish, for a combined total of 48 credits. Suggested areas: art, comparative literature, government and politics, history, philosophy, and Portuguese.

### Foreign Area Major

Courses: SPAN 207; 301-302; 311 or 312; 315 and 415 or 316 and 317; 321-322 or 323-324; 325-326 or 346-347, plus three courses in literature at the 400-level; one course may be taken in Luzo-Brazilian literature, for a total of 39 credits. Nine credits of supporting courses, six of which must be at the 300—or 400-level in a single area other than Spanish, for a combined total of 48 credits. Suggested areas: anthropology, economics, geography, government and politics, history, Portuguese, and sociology.

### Translation Option

Courses: SPAN 207; 301-302, 311 or 312; 316 and 317; two courses from 318, 356, 357, 416, 417; 321-322 or 323-324; one course from 325, 326, 346, 347; plus two courses in literature at the 400-level; one course may be taken in Luzo-Brazilian literature, for a total of 39 credits.

Nine credits of supporting courses, six of which must be at the 300- or 400-level in a single area other than Spanish, for a combined total of 48 credits. Suggested areas: art, comparative literature, government and politics, history, philosophy, and Portuguese.

### Business Option\*

Courses: SPAN 207; 211; 301-302; 311 or 312; 315 and 415; 316 and 317; 325-326 or 346-347; 422, for a total of 36 credits. Twelve credits of supporting courses, six of which must be at the 300—or 400—level in a single area other than Spanish. Suggested areas: business and management, economics, government and politics, history and geography.

Students interested in majoring in a combination of two Romance languages should see the description of the Romance Languages Program, above.

\*A double major program, Business, Language, and Cultures, combines International Business and Spanish.

## Citations

### Citations in Spanish Language and Cultures

15 credit hours. Five courses in Spanish from an approved list of courses. Courses taken through Study Abroad programs may be applied. Contact the Director of Undergraduate Studies for more information.

### Citation in Portuguese Languages and Cultures

15 credit hours. PORT 205, 231 and three courses from approved list of courses. Contact the Director of Undergraduate Studies for more information.

### Citation in Business Management for Spanish Majors (1105B)

15 credit hours. ECON 200 and four courses from approved list of BMGT courses. Contact Business, Culture and Language Program at (301) 405-2621 for more information.

### Citation in Business Spanish

15 credit hours. Five courses in Spanish from approved list of courses. Contact Business, Culture and Language Program at (301) 405-2621 for more information.

Students who fulfill Citation requirements will receive a Citation on the official transcript.

## Honors

The department Honors Program offers qualified students the possibility of working in close contact with a mentor on an original thesis. Honors seminars are primarily for students who have been accepted to the Program, but are open to others with the approval of the Honors Director. Honors students must take six credits of Honor Thesis. Interested students should see the Director of the Spanish Honors Program.

## Lower-Division Courses

The elementary and intermediate courses in Spanish and Portuguese consist of three semesters of four credits each (101, 102, 201). The language requirement for the B.A. degree in the College of Arts and Humanities is satisfied by passing 201 or equivalent. Students who wish to enroll in Spanish 101, 102, and 201 must present their high school transcript for proper placement. See the Schedule of Classes for further information. Students may not receive credits for both Spanish 102 and Spanish 103.

Transfer students with college credit have the option of continuing at the next level of study.

Students must take language acquisition courses sequentially, i.e., 101, 102, 201, 202, etc. Once credit has been received in a higher-level language acquisition or grammar course, a lower-level course may not be taken for credit.

Course Codes: SPAN, PORT

## SPECIAL EDUCATION (EDSP)

### College of Education

1308 Benjamin Building, (301) 405-6515/4  
[www.education.umd.edu/EDSP/](http://www.education.umd.edu/EDSP/)

Professor and Chair: Burke  
 Professors: Beckman, Egel, Graham, Harris, Hebel (Emeritus), Leone, Lieber, Moon, Speece  
 Associate Professors: Cooper, Kohl, Neubert  
 Assistant Professors: Drakeford, Maccini  
 Associate Director: McLaughlin  
 Research Associates: Barnwell, Case, Greig, Grigal, Gruber, Kelly, Meisel, Nagle, Warren  
 Undergraduate Coordinator: Molloy  
 Lecturers: Aiello, Danehey, Fink, Hines, Hudak, Page-Voth, Thanhouser, Waranch  
 Faculty Research Assistants: Brown, Caron, Merritt, Newcomb, Stepanek, Wayne, Young

The Special Education Department offers an innovative and rigorous undergraduate program which prepares teachers of infants, children, or young adults with disabilities. This program has been nationally recognized for many of its exemplary features. It is a five-year (10-semester, 150-credit hour) professional certification program which graduates students with a Bachelor of Science degree in special education with full special education teacher certification in the State of Maryland and certification reciprocity in 44 other states. Students considering a special education major enroll in courses which meet university and college requirements while they take supporting course work designed to provide an understanding of typical human development and basic psychological and sociological principles of human behavior. Special Education students receive specialized training in the following areas: language development; motor development; social-emotional development; typical human behavior; social and educational needs of individuals with disabilities; diagnostic and educational assessment procedures; instructional procedures and materials; curriculum development; classroom and behavior management; effective communication with the parents and families of children with disabilities; community resource planning; and local, state, and federal laws concerning children and youth with disabilities. Graduates of the program are expected to master specific skills in each of these areas.

### Requirements for Major

**Students interested in majoring in Special Education must consult a departmental advisor as early as possible after matriculation at the university** since the curriculum requires an extensive and sequenced program of studies. Students accepted as Special Education majors take a two-semester sequence of foundation special education courses and practicum experiences during the third year (Semesters V and VI). These courses provide the student with a solid foundation in theory and practice related to the education of all children with disabilities across a wide range of ages.

Students work directly with children or youth with disabilities during each semester, leading up to student teaching during the last semester.

### Combined Bachelor's/Master's Program

Selected undergraduate students majoring in special education will be eligible for dual application of credit to both the bachelor's and master's degrees. A student desiring graduate credit should apply for admission to the Graduate School during the last semester of the fourth year. If admitted to the Graduate School, the student may select up to 12 credits (four courses) of specified course work from the fifth year of the undergraduate program to be applied simultaneously toward the credits required for the master's degree in special education at the University of Maryland. The selected courses may not include field practica or student teaching experiences. Students will be expected to fulfill supplemental requirements in the selected courses. To complete the master's degree, students must fulfill all Graduate School requirements for the degree, with the exception of the selected 400-level courses.

## Admission

Prior to formal acceptance as a special education major, all students are required to enroll in a special education introductory course (EDSP 210) which provides a survey of the history and current issues in special education. Upon successful completion of the introductory course and 45 semester hours of requirements, students apply for formal admission to

## 146 Statistics

the professional program of the Department of Special Education by submitting an application with a statement of intent specifying their professional goals. To be accepted as a full special education major, students must fulfill the College of Education requirements for admission to Teacher Education, as well as the following departmental conditions:

1. Completion of course work indicated below with an asterisk.
2. Admission is competitive beyond the minimum 2.5 grade point average required for consideration.
3. Submission of an application together with a statement of intent specifying the applicant's professional goals.
4. Submission of three letters of recommendation.

Admittance will be based on the completion of the required courses, the grade point average, the applicant's experience with persons with disabilities, and the appropriateness and clarity of the professional goal statement. An appeals process has been established for students who do not meet the competitive GPA for admission, but who are applying in connection with special university programs including affirmative action and academic promise.

### Advising

The Department of Special Education provides academic advisement through a faculty and a peer advisement program. Special Education majors are assigned a faculty advisor, who is carefully matched to the student's area of interest. It is required that all students consult an advisor each semester. Students are urged to use the Special Education Advising Center, 1235 Benjamin Building.

### Awards

The Department of Special Education Student Service Award is presented annually to the graduating senior who has demonstrated outstanding leadership and service to the Special Education Department.

### Student Organizations

The Department of Special Education encourages student participation in extracurricular activities within and outside of the University. Opportunities within the department include the Council for Exceptional Children. For more information, stop by the Special Education Advising Center, 1235 Benjamin Building.

### Required Courses

All preprofessional and professional course work must be completed with a grade of C or better prior to student teaching. CORE Liberal Arts and Science Studies Program Requirements include the following courses which are departmental requirements: (Consult with a departmental advisor with regard to USP requirements.)

- \*HIST 156 or HIST 157 (3)
- \*STAT 100 (3)
- \*Lab Science (4)
- \*ENGL Literature (3)
- \*PSYC 100 (3)
- \*SOCY 100 or 105 (3)

#### Other Academic Support Courses

- \*HESP 202 (3)
- MATH 210 (4)
- \*EDHD 411 or PSYC 355 (3)
- \*EDHD Elective (See Department for approved list.)

#### Professional Courses

- \*EDSP 210—Introduction to Special Education (3)
- EDCI 385—Computers for Teachers
- EDHD 425—Language Development and Reading Acquisition (3)
- EDPL 301—Foundations of Education (3)
- EDSP 403—Instruction of Students with Physical Disabilities (3)
- EDSP 406—Field Placement I: Special Education (1)
- EDSP 407—Field Placement II: Special Education (3)
- EDSP 413—Behavior and Classroom Management in Special Education (3)
- EDSP 415—Assessment in Special Education (3)
- EDSP 416—Reading and Writing Instruction in Special Education I (3)

## Specialty Area Requirements

### The Early Childhood Special Education Option

- EDSP 400—Functional Assessment & Instruction in Special Education (3)
- EDSP 484—Reading and Writing Instruction in Special Education II (3)
- EDSP 420—Characteristics of Infants & Young Children: Early Childhood Special Education (3)
- EDSP 421—Field Placement III: Early Childhood Special Education (4)
- EDSP 423—Assessment in Early Childhood Special Education (3)
- EDSP 430—Early Intervention: Early Childhood Special Education (3)
- EDSP 424—Field Placement IV: Early Childhood Special Education (4)
- Major Elective (see Department for approved list) (3)
- EDSP 422—Curriculum and Instruction: Early Childhood Special Education (3)
- EDSP 487—Family Partnerships in Special Education (3)
- EDSP 404—Education of Students with Autism (3)
- EDSP 431—Field Placement V: Early Childhood Special Education (4)
- EDSP 490—Capstone Seminar in Special Education (3)
- EDSP 494—Internship: Early Childhood Special Education (11)

### The Elementary Special Education Option

- EDSP 400—Functional Assessment & Instruction in Special Education (3)
- EDSP 484—Reading and Writing Instruction in Special Education II (3)
- EDSP 451—Curriculum & Instruction: Elementary Special Education (3)
- EDSP 452—Field Placement III: Elementary Special Education (4)
- EDSP 410—Community-Based Assessment & Curriculum in Special Education (3)
- EDSP 453—Methods & Models of Instruction: Elementary Special Education (3)
- EDSP 485—Assessment and Instruction in Mathematics in Special Education (3)
- EDSP 454—Field Placement IV: Elementary Special Education (4)
- EDSP 487—Family Partnerships in Special Education (3)
- EDSP 455—Assessment in Elementary Special Education (3)
- EDSP 486—Promoting Prosocial Behavior in Special Education (3)
- EDSP 456—Field Placement V: Elementary Special Education (4)
- EDSP 490—Capstone Seminar in Special Education (3)
- EDSP 495—Internship: Elementary Special Education (11)

### The Secondary/Middle Special Education Option

- EDSP 400—Functional Assessment & Instruction in Special Education (3)
- EDSP 466—Issues and Models: Secondary/Middle Special Education (3)
- EDHD 426—Cognition and Motivation in Reading: Reading in Content Areas I (3)
- EDSP 434—Field Placement III: Secondary/Middle Special Education (4)
- EDSP 410—Community-Based Assessment & Curriculum in Special Education (3)
- EDSP 474—Assessment in Secondary/ Middle Special Education (3)
- EDCI 463—Reading in Secondary School (3)
- EDSP 485—Assessment and Instruction in Mathematics in Special Education (3)
- EDSP 435—Field Placement IV: Secondary/Middle Special Education (4)
- EDSP 477—Curriculum, Assessment, & Instruction in Secondary/Middle Special Education (3)
- EDSP 487—Family Partnerships in Special Education (3)
- EDSP 486—Promoting Prosocial Behavior in Special Education (3)
- EDSP 436—Field Placement V: Secondary/Middle Special Education (4)
- EDSP 490—Capstone Seminar in Special Education (3)
- EDSP 496—Internship: Secondary/Middle Special Education (11)

Course Code: EDSP

## Speech Communication

The Department of Speech Communication is now the Department of Communication. See entry elsewhere in this chapter.

## STATISTICS

For information consult the entry under Mathematical Statistics Program.

## THEATRE (THET)

### College of Arts and Humanities

2809 Clarice Smith Performing Arts Center, (301) 405-6676

E-mail: thetdept@umdacc.umd.edu

[www.theatre.umd.edu](http://www.theatre.umd.edu)

Acting Chair: Wagner

Professors: Hébert, Hildy, Huang, Wagner

Associate Professors: Conway, Coustaut, Patterson, Reese, Schuler

Assistant Professors: Burbank, Cabot, Nathans

Instructors: Deighton, Kriebs

Emeritus: Gillespie, Meersman, Pugliese

### The Major

Small classes, student-faculty town meetings, and a close knit departmental environment promote a strong sense of community within the Department of Theatre. It is a lively, multi-cultural community where the contributions of all are valued. An extensive schedule of departmental and student productions offer students myriad opportunities to practice their craft. The department is a supportive and stimulating environment that fosters students' creative development and spurs their achievements. A well-rounded and comprehensive curriculum prepares for careers in acting, directing, design, technical theatre, theatre management, and teaching. Since the skills cultivated by a liberal arts approach to theatre study—self-discipline, creativity, self-confidence, and critical thinking—are valuable in all career fields, theatre training is an excellent preparation for any profession. Our performance, design, and technical theatre faculty are active in professional as well as academic theatre—members of Actors Equity and United Scenic Artists—providing students a vital link to the world of professional theatre. Our history, criticism, and theory faculty regularly publish and participate at national and international conferences. Situated in close proximity to the vibrant and stimulating professional theatre world of Washington, D.C. and Baltimore, students have ready access to the best of both contemporary and classical productions. They enjoy a unique opportunity to participate in this busy theatrical region through internships and other projects. The Clarice Smith Performing Arts Center is the largest facility of its kind on any university campus in the nation. The Center features six state-of-the-art performing venues including a 650 seat proscenium theatre and 100 and 200 seat experimental theatres. In addition, the center houses the Department of Dance, School of Music, and a Performing Arts Library.

The department offers two tracks leading to the B.A. in Theatre. Both share a common core of classwork, which provides a solid liberal arts grounding. The Performance Track is an intensive training in acting, vocal production, movement, and directing. The Design and Production Track encompasses a comprehensive study in scene design, costume design, lighting design, sound design, stage management, and technical direction. In cooperation with the Department of Curriculum and Instruction, a selective admission program for teacher certification in Theatre/English Education is available. For more information, see an advisor in EDU 2311.

### Requirements for Major

Requirements for the College of Arts and Humanities include a minimum of 45 upper-level credits and a foreign language requirement.

Major requirements are 43 credits of course work in theatre, exclusive of those courses taken to satisfy the college and university requirements, plus 10-12 credits of supporting area courses. Of the 43 credits, at least 21 must be upper-level (300-400 series). No course with a grade less than C may be used to satisfy major or supporting area requirements.

Required core courses for all majors (31 credits): THET 110, 111, 220, 170, 171, 279, 330, 475, 479, 490, 491.

Design Emphasis (12 credits): THET 273, 373 required. Choose two of the following: 371, 377, 383.

Performance Emphasis (12 credits): THET 221\*, 320\*, 387. Choose one of the following: 420\*, 430, 474.

\*An audition is required for these courses.

Supporting courses (10-12 credits): Two from each of the following: ENGL 304, 305, 403, 404, 434, 450, 451, 452, 454; 4-6 credits from any DANC, MUSC, ARTH, or ARTT course approved by the departmental advisor.

## Advising

Advising is mandatory for undergraduate theatre majors. Students should contact the Department of Theatre office for registration information before making an appointment with their adviser.

## Financial Aid

Scholarships and financial assistance may be awarded to prospective and enrolled students through a number of Creative and Performing Arts Scholarships and Theatre Patrons Scholarships. Other scholarships and workshops are awarded yearly to continuing students. For further information, contact the Coordinator of the Scholarship Program or visit our web site at [www.theatre.umd.edu](http://www.theatre.umd.edu).

Course Code: THET

## WOMEN'S STUDIES (WMST)

### College of Arts and Humanities

2101 Woods Hall, (301) 405-6877

[www.womensstudies.umd.edu](http://www.womensstudies.umd.edu)

Professor and Chair: Moses

Professors: Bolles, Dill, Rosenfelt, Zambrana

Associate Professors: Barkely Brown, Kim, King

Affiliate Professors: Gerber, Sorenson (Academy of Leadership), Harley, Wilson (Afro-American Studies); Michel, Parks, Sies, Struna (American Studies);Friedenberg, Paolisso (Anthropology); Withers (ArtHistory); Jones, Kerkham, Liu (Asian and East European); Palmer (Biology); Greer (Chemical Engineering); Dietrich, Doherty, Hallet, Stehle (Classics); Aldoory, Grunig, Parry-Giles (Communication); Collins, Conroy, Fuegi (Comparative Literature); Fassinger (Counseling and Personnel Services); Coletti, Donawerth, Kauffman, Kornblatt, Leonardi, Lindemann, Logan, Peterson, Ray, Rosenthal, Smith, Washington (English); Leslie (Family Studies); Letzter, Mossman (French and Italian Languages and Literature); Frederickson, Oster, Strauch (Germanic Studies); Bedos-Rezak, Brush, Gullickson, Lyons, Muncy, Weinstein, Zilfi (History); Nettles (Human Development), Beasley (Journalism); Luckert, Masnick (Library Services); Robertson (Music); Fullinwider, Li (Philosophy and Public Policy); O'Brien, Scholnick (Psychology); Bianchi, DeRose, Desai, Hunt, Milkie, Moghadam, Presser, Segal (Sociology); Cypess, Rodriguez (Spanish and Portuguese Languages and Literature); Burbank, Coustaut, Schuler (Theatre)

To obtain information options for students interested in Women's Studies contact the Undergraduate Academic Advisor, Dept. of Women's Studies, 2101 Woods Hall; 301-405-6827.

### The Major

The Women's Studies major offers students a coherent but flexible program of study examining scholarship and theory on the history, status, contributions, and experiences of women in diverse cultural communities, and on the significance of gender as a social construct and as an analytical category.

### Requirements for the Major

Students will earn a total of 39-42 credit hours, distributed as indicated below. Drawing from approximately fifty course, many of which are cross-listed with other academic units, students will have the opportunity to design an emphasis within the major relevant to their special interests. A number of courses may count in more than one category. At least 30 credits must be at or above the 300 level. No course with a grade less than C may be used to satisfy the major. Students will design their programs in consultation with a Women's Studies advisor.

#### 1. Foundation Courses (18 credit hours)

- WMST 200—Introduction to Women's Studies: Women and Society ...(3)  
OR
- WMST 250—Introduction to Women's Studies: Women, Art & Culture (3)
- WMST 300—Feminist Reconceptualizations .....(3)
- WMST 350—Feminist Education Practicum and Analysis .....(6)  
OR
- WMST 380—Women's Studies Field Work and Analysis .....(6)
- WMST 400—Theories of Feminism .....(3)
- WMST 488—Senior Seminar .....(3)

# 148 Zoology

## 2. Distributive Courses

### Area 1: Arts and Literature (3 credit hours)

WMST 241—Women Writers of French Expression in Translation (X-listed as FREN241) .....	(3)
WMST 250—Introduction to Women's Studies: Women, Art, and Culture .....	(3)
WMST 255—Introduction to Literature by Women (X-listed as ENGL255) .....	(3)
WMST 275—World Literature by Women (X-listed as CMLT 275) .....	(3)
WMST 281—Women in German Literature and Society (X-listed as GERM281) .....	(3)
WMST 348—Literary Works by Women (X-listed as ENGL348) .....	(3)
WMST 408—Special Topics in Literature by Women before 1800 (X-listed as ENGL 408) .....	(3)
WMST 444—Feminist Critical Theory (X-listed as ENGL 444) .....	(3)
WMST 448—Special Topics in Literature by Women of Color* (X-listed as ENGL448) .....	(3)
WMST 458—Special Topics in Literature by Women after 1800 (X-listed as ENGL458) .....	(3)
WMST 466—Feminist Perspective on Women in Art (X-listed as ARTH466).....	(3)
WMST 468—Feminist Cultural Studies .....	(3)
WMST 481—Femmes Fatales and the Representation of Violence in Literature(X-listed as FREN481) .....	(3)
WMST 496—African-American Women Filmmakers* (X-listed as THET 496) .....	(3)
FREN 482—Gender and Ethnicity in Modern French Literature .....	(3)

### Area II: Historical Perspectives (3 credit hours)

WMST 210—Women in America to 1880(X-listed as HIST 210) .....	(3)
WMST 211—Women in America Since 1880 (X-listed as HIST 211) ...	(3)
WMST 212—Women in Western Europe, 1750-present (X-listed as HIST212) .....	(3)
WMST 320—Women in Classical Antiquity (X-listed as CLAS 320) .....	(3)
WMST 453—Victorian Women in England, France, and the United States (X-listed as HIST 493) .....	(3)
WMST 454—Women in Africa* (X-listed as HIST 494) .....	(3)
WMST 455—Women in Medieval Culture and Society (X-listed as HIST495) .....	(3)
WMST 456—Women in the Middle East* .....	(3)
WMST 457—Changing Perceptions of Gender in the US: 1880-1935 (X-listed as HIST 433).....	(3)
AASP 498W—Black Women in United States History* .....	(3)
AMST 418J—Women and Family in American Life .....	(3)
HIST 309—Proseminar in Historical Writing: Women's History .....	(3)

### Area III: Social and Natural Sciences (3 credit hours)

WMST 200—Introduction to Women's Studies: Women and Society ...	(3)
WMST 313—Women and Science (X-listed as BSCI 313).....	(3)
WMST 324—Communication and Gender (X-listed as COMM 324) .....	(3)
WMST 325—Sociology of Gender (X-listed as SOCY 325) .....	(3)
WMST 326—Biology of Reproduction (X-listed as BSCI 342) .....	(3)
WMST 336—Psychology of Women (X-listed as PSYC 366) .....	(3)
WMST 360—Caribbean Women* .....	(3)
WMST 410—Women in the African Diaspora* .....	(3)
WMST 420—Asian-American Women* .....	(3)
WMST 425—Gender Roles and Social Institutions .....	(3)
WMST 430—Gender Issues in Families (X-listed as FMST 430) .....	(3)
WMST 436—Legal Status of Women (X-listed as GVPT 436) .....	(3)
WMST 452—Women and the Media (X-listed as JOUR 452) .....	(3)
WMST 471—Women's Health (X-listed as HLTH 471) .....	(3)
WMST 493—Jewish Women in International Perspective* .....	(3)
WMST 494—Lesbian Communities and Difference* .....	(3)
AASP 498F—Special Topics in Black Culture: Women and Work* .....	(3)
CCJS 498—Special Topics in Criminology and Criminal Justice: Women and Crime .....	(3)
SOCY 498W:—Special Topics in Sociology: Women in the Military .....	(3)

\*Fulfills Women's Studies Multi-Cultural Requirement

## 3. Courses in Cultural Diversity (6 credit hours)

Approved courses are noted with an asterisk in section 2, above. Courses in this category may overlap with other requirements

## 4. Student-Developed Emphasis (9 credit hours)

Each student, with the help of the Academic advisor, will design an emphasis relevant to their special interests. Courses will ordinarily be drawn from the more than 50 courses approved for the major; in some instances, students may secure permission to include other courses.

## 5. Electives

Students should select their elective from the full list of courses for the major. The number of credit hours will vary depending on the individual student's program, but should bring the total number of semester credit hours to at least 39.

## Honors

The Honors Program is designed to give students the opportunity to pursue rigorous interdisciplinary research and writing. Interested students who have a GPA of at least 3.0 should apply in their junior year. Students are required to take six credits of upper-level honors or honors-options courses and an honors seminar (WMST 488H), as well as write and defend a thesis.

## Advising

Advising is mandatory for all majors each semester.

Course Code: WMST

## ZOOLOGY

Departments in the College of Life Sciences have been reorganized. Courses in zoology are now offered by the Department of Biology.

## CAMPUS-WIDE PROGRAMS

### Air Force Aerospace Studies Program (ROTC)

2126 Cole Student Activities Bldg., (301) 314-3242

Director: Setnor

Assistant Professors: Jairam, Martinez, Scannelli, Stratton

Staff: Condon, Unsel

The Air Force Reserve Officers Training Corps (ROTC) provides two programs for college men and women to earn a commission as a Second Lieutenant in the United States Air Force while completing their University degree requirements. To enter the AFROTC program, students should inform their adviser, and register for classes in the same manner as for other courses.

Additional information may be obtained by telephoning the Office of Aerospace Studies, (301) 314-3242.

### Four-Year Program

This program is composed of a General Military Course (GMC) and a Professional Officer Course (POC). The first two years (GMC), normally for freshmen and sophomores, give a general introduction to the Air Force and the various career fields. Students enrolled in the GMC program incur no obligation and may elect to discontinue the program at any time. The final two years (POC) concentrate on the development of leadership skills and the study of United States defense policy. Students must compete for acceptance into the POC. Students enrolled in the last two years of the program are eligible for an AFROTC scholarship.

Students in the four-year program who successfully complete the first two years of the program and are accepted into the POC program must attend four weeks of field training at a designated Air Force base during the summer after completing their sophomore year of college.

### Two-Year Program

This program is normally offered to prospective juniors but may be taken by seniors and graduate students. The academic requirements for this program are identical to the final two years of the four-year program and students are eligible to receive the same benefits. During the summer preceding entry into the program, all candidates must attend five weeks of field training at a designated Air Force base. Students should start the application process as soon as possible—not later than the January prior to joining the cadet corps.

## The Curriculum

### General Military Course (GMC)

**Freshman year**—ARSC 100 (Fall) and ARSC 101 (Spring). These courses introduce the student to the roles of the Department of Defense and the U.S. Air Force in the contemporary world. Each one-credit course consists of one hour of academic class and two hours of Leadership Laboratory each week.

**Sophomore year**—ARSC 200 (Fall) and ARSC 201 (Spring). ARSC 200 provides an historical review of air power employment in military and nonmilitary operations in support of national objectives and a look at the evolution of air power concepts and doctrine. ARSC 201 examines concepts of leadership, ethics, and quality. Each one-credit course consists of one hour of academic class and two hours of Leadership Laboratory each week.

### Professional Officers Course (POC)

**Junior year**—ARSC 300 (Fall) and ARSC 301 (Spring). 3 credits per semester. Course introduces students to management and leadership theory and application. Leadership laboratory participation is required for AFROTC cadets.

**Senior year**—ARSC 400 (Fall) and ARSC 401 (Spring). 3 credits per semester. Course reviews history of American defense/foreign policy. Second semester concentrates on ethics, military justice, officership and related issues. Leadership laboratory participation is required for AFROTC cadets.

All Aerospace courses are open to any university student for credit whether or not he or she is in the AFROTC Program. Students who are not in the AFROTC Program do not attend the Leadership Laboratory.

### General Requirements for Acceptance into the POC

The student must complete the General Military Course and the field training session, pass the Air Force Officer Qualifying Test, be physically qualified, be in good academic standing, meet age requirements and be a U.S. citizen. Successful completion of the Professional Officer Course and a bachelor's degree or higher are prerequisites for a commission as a Second Lieutenant in the United States Air Force.

### Scholarships and Incentives

AFROTC scholarship programs provide four-, three-, and two-year scholarships to students on a competitive basis. Scholarships are available in many fields and are based on merit. Those selected receive tuition, lab expenses, incidental fees, and book allowance plus a non-taxable monthly allowance of a minimum of \$250. All POCs are eligible for incentive money and monthly allowance. Call (301) 314-3242 for current scholarship opportunities.

Any student accepted by the University of Maryland may apply for these scholarships. AFROTC membership is required to receive an AFROTC scholarship.

### AFROTC Awards

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

Course Code: ARSC

### Army Reserve Officer's Training Corps Program

1150 Cole Student Activities Building, (301) 314-9238

Director: LTC Valerie Border  
Assistant Professors: CPT Tracy Koivisto, CPT Avery Goss  
Staff: SFC Kevin Epps, SSG Tonia Edwards

The Army Reserve Officers Training Corps offers the best leadership training available in America. It provides two courses of study for university students to earn a commission as a Second Lieutenant in the United States Army (Active, Reserve, or National Guard) while also completing their university degree requirements. To join Army ROTC, students should inform their advisors and register for classes in the same manner as for other courses.

Additional information may be obtained by telephoning the Army ROTC department at (301) 314-9238.

## Four Year Program

This program is composed of the Basic Leadership Course and the Advance Leadership Course. The first two years (Basic Course), normally for freshmen and sophomores, consists of a general introduction to military customs and courtesy, soldier skills, communication skills, personal development, and introductory leadership skills. Students enrolled in the basic course incur no obligation and may discontinue the program at any time. The final two years (Advance Course) concentrate on developing leadership skills in organizations. Students must have permission of the Director of Army ROTC to enroll in the Advanced Course.

Students in the Advanced Course must attend five weeks of field training at Fort Lewis, Washington the summer after their junior year.

## Two-Year Program

This program is available to students with two years and a summer remaining in their university studies. The academic requirements for this program are identical to the Advanced Course in the four-year program, and students are eligible to receive the same benefits. During the summer preceding the junior year, students must attend five-weeks of field training at Fort Knox, Kentucky. Students should start the application process for this option no later than January of their Sophomore year.

## The Curriculum

### Basic Leadership Course

Freshman year – ARMY 101 (fall) and ARMY 102 (Spring). These courses introduce the student to military customs and courtesies, historical traditions, and leadership theory as well as personal development.

Sophomore year – ARMY 201 (fall) and ARMY 202 (Spring). These courses focus on developing written and verbal communication skills, building teams within organizations, understanding military ethics and values, and understanding officership as a profession.

### Advanced Leadership Course

Junior year – ARMY 301 (fall) and ARMY 302 (spring). These courses focus on tactics, problem solving, planning operations, and the army's strategic role.

Senior year – ARMY 401 (fall) and ARMY 402 (spring). These courses are the culminating leadership classes and include a leadership project as well as instruction on military law, and administration.

All Army ROTC classes are open to any university student for elective credit whether or not he/she is enrolled as a cadet in the Army ROTC program.

### Scholarships and Incentives

Army ROTC Scholarships are available for four, three or two years on a competitive basis. The scholarships are based solely on merit—not financial need. Those selected receive tuition and mandatory fees, a book allowance, and a non-taxable monthly allowance ranging from \$250-\$400 based on academic year.

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## STUDY ABROAD PROGRAMS

3125 Mitchell Bldg., (301) 314-7746  
E-mail: [studyabr@deans.umd.edu](mailto:studyabr@deans.umd.edu)  
[www.umd.edu/studyabroad](http://www.umd.edu/studyabroad)  
Coordinator: Rick Weaver

The goal of the Study Abroad Office is to enable students to incorporate a summer, winter, semester, or year abroad into their degree program at Maryland. Study abroad increases awareness of other cultures and languages while providing a comparative international perspective. Many students find study abroad essential for their major or career plans. Others view it as part of their liberal arts education.

### Advising and Information

The Study Abroad Office provides handouts and advising on the wide variety of programs available. A small library provides information on programs offered by other universities. The office assists students in obtaining credit for their experience abroad. Students may use study abroad to enrich their programs and to fulfill CORE requirements and electives.

## 150 Study Abroad Programs

### Maryland Study Abroad Semester/Year Programs

**Study In London:** The curriculum consists of courses in the humanities, business, social sciences, and sciences. Students live in dorms or in flats with other program participants. Fall and spring semester or year.

**Study in Nice, France:** Offers French language courses for foreigners at the University of Nice. Students also take a course with the Maryland Resident Director. Year or spring semester.

**Study in Alcalá, Spain:** Offers Spanish language and culture studies at the University of Alcalá de Henares. Students may enroll in an internship or in a course in Spanish literature, business, or civilization. Spring semester.

**Study in Rome, Italy:** Students take courses in English at the American University of Rome (AUR). AUR offers instruction in the liberal arts, business, Italian language and culture, and international studies. The program is administered by Towson University.

**Denmark's International Study Program:** Maryland acts as a coordinator for DIS in Copenhagen, which offers courses in English focusing on humanities and social sciences, international business, marine biology, environmental studies, early multi-cultural education, and medical practice and policy. Fall and spring semester, or year.

**German and Engineering:** As a part of the dual degree program, students spend six months in Germany studying the language and completing an internship with an engineering company. A two-month, intensive technical German language study is followed by a four month paid internship in Germany. Spring semester.

### Winterterm

New and exciting programs are offered every year. At the time of printing, Winterterm 2004 programs were being developed. In 2003, the following winterterm programs were offered:

#### Argentina: "Politics of Globalization"

This three-credit course (SOCY 498W / LASC458A) will involve students from the University of Maryland and the Universidad Nacional de San Martin, Argentina. Through readings, discussion groups, and field trips to organizations in both Washington DC and Buenos Aires, students will explore the extent to which a new emerging consensus among international organizations is affecting poverty and inequality in the Southern Hemisphere.

#### Belize: "Mayan Culture and the Interface between Tropical Rainforests and Coral Reefs"

This two-credit course (BIOL 288) combines study and examination of recently discovered archeological sites of Mayan culture and exploration of the tropical rainforests and the second largest barrier reef in the world.

#### Brazil: "African-Brazilian History and Culture in Salvador da Bahia"

This intensive three-week course (LASC458B/ HIST419/ HIST619) will introduce students to the African diaspora culture and language in Brazil with emphases on Salvador da Bahia and Northeast Brazil. The three-week program will focus on both historical and present day culture and language, with emphases on religion, dance, music, literature, and theater.

#### China: "Environment and Development in Contemporary China"

This course (GVPT 359A) will emphasize learning through field trips and first-hand experience. The program will include visits to government offices, businesses, and environmental groups. Participants will consider issues of rural development and de-collectivization; population growth and policy; urban migration, historical preservation, and urban modernization; backyard coal burning boilers and steel development; the Beijing Olympics and environmental clean up.

#### Costa Rica: "Sustainable Tropical Ecosystems"

This course (NRSL 499C 2 or 3 credits or HONR 379K 3 credits) provides students with the opportunity to explore a variety of ecosystems in Costa Rica and to understand economic and environmental resource issues. Participants explore the environmental consequences of agricultural development and the concepts of ecotourism and agro-ecotourism.

#### Cuba: "Cuban Arts and Culture: Tradition and Innovations"

This course (SPAN 488) will introduce students to the study of the artistic and cultural manifestation of contemporary Cuba, and the extent to which traditional forms and innovative solutions have fused to create a complex national identity. Participants will have the opportunity to visit the great institutions of culture (museums, churches) and meet with writers, artists, and filmmakers.

#### France and Germany: "International Business Cultures in Engineering and Technology"

This course (ARHU 439T) will help students gain an understanding of how the business cultures in the European Union, and specifically in France and Germany, differ from that of North America. In addition, students will develop the cultural understanding, attitudes, and communication skills needed to function appropriately within an increasingly global and multi-cultural environment.

#### Germany: "Germany in the New Europe: Politics, Business and Culture"

This three-credit course (GVPT 388T/BMGT 398B) focuses on politics, business, and culture. Through lectures, readings, and field visits, participants will explore Germany's place in the new Europe, and how German and European political and business cultures and institutions were shaped and operate today.

#### Italy: "Ancient Greek and Roman Cultures in Context"

This course (CLAS 100 or CLAS 499) explores on-site the classical roots of many cultures in the world. Students will study the preserved ancient cities of Naples, Oplontis, Herculanaeum Paestum, Vesuvius, Capri, and Pompeii. Students will also explore the culture of Rome.

#### Italy: "Odyssey to the Euro: European Economic History"

This three-credit course (ECON 310/HONR 328R) will examine how changing human consciousness has shaped new economic institutions. We will explore the evolution of the economy from prehistory to the creation of the Euro. The course stresses the interplay of culture and economic life, deepens understanding of how we got where we are, and shows that the world can be changed. Participants will visit Florence, Rome, Naples, Pompeii, Solfatara, Cumae, Paestum, Velia and Ascea among other locations.

#### London, Paris, Amsterdam: "Understanding and Treating HIV/AIDS in Western Europe"

This three-credit program (BSCI/UNIV 279) will utilize the rich resources of each city visited to help examine the healthcare systems and the history of medicine in several countries. For example, in London participants will meet with community service organizations that serve African immigrants infected with HIV and visit a hospice caring for patients dying of AIDS. In Paris, participants will learn about efforts to provide effective sex education to French youth and meet with epidemiologists tracking the spread of the disease. And in Amsterdam, participants will investigate how that city deals with emerging HIV/AIDS cases, especially among sex workers and intravenous drug users. Along the way, participants will take time to visit sites such as the Tower of London, the Eiffel Tower and the Van Gogh Museum.

### Summer Programs

**Architecture Abroad:** The School of Architecture sponsors various summer study programs in Europe and the developing world. These programs allow students at an advanced undergraduate and graduate level to deal creatively with architectural issues in a foreign environment.

#### Barcelona and Salamanca, Spain: "Intensive Spanish Language and Culture"

The Department of Spanish and Portuguese sponsors a six-credit intensive language and culture program in Spain. The program seeks to develop the Spanish language proficiency of the students and to introduce the culture and life of Spain through active participation in academic courses, interaction with Spanish students, housing placements with Spanish families living in Salamanca and Barcelona, as well as different excursions throughout the cities and the surrounding countryside.

#### College Park and England: "Shakespeare on His Own Ground: Literature, History and Performance"

This three-credit course (ENGL 205, ENGL 379 or HONR 258K) allows participants to attend performances of Shakespeare's plays in England and visit places associated with him and his times, following a period of classroom study in College Park. This interdisciplinary course is team-taught by a literary scholar and a historian and combines study of Shakespeare's plays from both literary and performance perspectives. Students will also examine the theatrical history of Shakespeare's time and a broader history of 16th and 17th century England.

#### Belgium: "Archaeology and Heritage in Flanders, Belgium: A Multi-Cultural European Past"

This six-credit intensive course (ANTH 448E/F) will explore the archeological and historic heritage of Flanders. Students will participate in the excavation and analysis of medieval settlements, churches, and monasteries. Participants will also explore the effects of visitors and tourism on historic buildings, urban development, and the local population.

**Ghana: “Contemporary African Society: A Ghanaian Case Study”**

This three-credit course (AASP 398G) offered by the Afro-American Studies Program will examine contemporary aspects of Ghanaian society and development regarding, among others, the institutions of religion and family; politics and political organization (including the role of the military); social structure, ethnicity, and gender; economic organization and international influences; population and health issues with emphases on HIV/AIDS, high fertility, urbanization and the role of the media and civil society in contemporary development.

**Greece: “The Living Legacy”**

This three-credit course (CLAS 100 or CLAS 499) will allow participants to relive the glories of the past while savoring the vibrant life of modern Greece. Students will be tested on the material covered in the introductory lectures at College Park and the material discussed during the lecture tours in Greece. Participants will visit some of the Greek islands and cities and archaeological sites and scenic regions of Greece.

**Grenoble, France: “Doing Business in Europe: Economic, Technology and Cultural Factors”**

This three-credit course (BMGT 398) studies issues and opportunities pertaining to European participation in the Union. Specifically, this course will address globalization and the Internet in the European context. The students will benefit from the combined expertise of the Smith School of Business at Maryland and the University of Grenoble, two institutions at the forefront of research and education for the global New Economy.

**London, England: “British Art in London: From Hadrian to Hirst”**

This three-credit course (ARTH 489Z) offers the advantages of London’s concentration of museums, galleries, and historical buildings, which will allow the student to experience British art in its cultural context. The course will be conducted in a hands-on, experiential manner, with students visiting a different site each day. This contrasts with the university method of teaching art history, where lectures are organized around slides and other technological means of teaching.

**London, Norfolk, England: “Honors Survey of British History, Culture and Literature”**

This course is an intense three-week examination (HONR 318) of British culture in London and at a number of other historic and literary sites in England. The course has six focal points: History, Literature, Drama, Architecture, Art, and Archaeology. Students will have lectures and visits in all these areas but will select three to concentrate on for their papers.

**Oxford, England: “Honors Programme in British Law, Politics and Society”**

The three-week program offers students an in-depth look at British law, politics, and society. Students will take two course modules: one required course in “Law and Society” and one course focusing on British politics or contemporary British society.

**Tübingen, Germany: “Intensive Language and Culture”**

The Department of Germanic Studies sponsors a four-week intensive language and culture program in Tübingen, Germany. Participants will take part in activities while learning about history, culture and contemporary issues.

**Taxco, Mexico: “Intensive Spanish Language”**

The Department of Spanish and Portuguese sponsors a six-credit intensive Spanish language program for students at the elementary and intermediate levels. Participants will have the opportunity to improve their Spanish and delve firsthand into the culture of Mexico, visiting museums and archeological sites of significant historical and artistic interest.

**Taxco, Mexico: “International Perspectives on Language Schooling and Culture: Cultural and Linguistic Immersion for Teachers of ESOL”**

The purpose of this program is to contribute to the development of cultural competency for ESOL teachers working with diverse populations. Participants will participate in a variety of purposeful, carefully designed educational activities. Participants will attend Spanish lessons, assist as an EFL teacher, discuss second language pedagogy with local EFL teachers, and participate in a graduate seminar comprising cross-cultural and pedagogical topics. In addition, the program will organize cultural tours and trips to one or two local schools may be possible.

**Exchanges**

The Study Abroad Office administers reciprocal exchanges with specific universities in the U.K., Japan, Korea, Germany, Austria, and Sweden. These exchanges are often related to academic departments and require extensive language or academic background. All the exchanges require at least a 3.0 grade point average.

Exchanges are available with the following British universities: King’s College for engineering and physics majors; University of Kent for government and politics majors; Kingston University for chemistry majors; University of Sheffield for English majors and American studies majors; University of Lancaster for math and other majors; University of Bristol for philosophy majors; University of Surrey for sociology majors; University of Keele for criminology and other majors; and University of Liverpool for history majors.

In Japan, students may study intensive Japanese language at Keio University, and may study humanities, social sciences, and sciences and engineering at Hiroshima and Chiba universities. In Korea, students attend Yonsei University. In Germany, exchanges are available with the University of Tübingen and the Gesamthochschule Kassel. In Austria, students attend the University of Vienna. In Sweden, exchange opportunities are available at Uppsala University. In Brazil, exchange opportunities are available at Portificia Universidade Catolica in Rio de Janeiro.

**UNDERGRADUATE STUDIES****University Honors Program**

Anne Arundel Hall, (301) 405-6771/3

[www.honors.umd.edu](http://www.honors.umd.edu)

Director: Mack

The University Honors Programs offers the most talented students on campus special educational opportunities and resources. Honors students combine Honors course work with regular electives and studies in their major to deepen their total educational experience. First- and second-year undergraduates broaden their intellectual horizons by selecting Honors seminars and Honors versions of regular courses in the arts and sciences, most of which fulfill CORE (general education) requirements. They may earn the Honors Citation by fulfilling all requirements in five semesters. Juniors and seniors may continue taking Honors seminars, teach in two one-credit colloquia for first-year students, and apply to more than 30 departmental or college Honors programs that provide opportunities to work closely with faculty mentors on independent research projects.

Honors seminars offer small (12-20 students) academic experiences characterized by active participation, intensive writing, and faculty who encourage critical thinking and reflective learning. HONR 1692, *Knowledge and Its Human Implications*, provides second-semester Honors students with the option of a challenging, interdisciplinary common intellectual experience.

Anne Arundel Hall, the Honors Living/Learning Center, houses 100 of the Honors students, program staff, scholar-in-residence, computer lab, Portz Library, seminar rooms, and lounges. Other Honors students live and study together in Queen Anne’s Hall, Denton Hall and on designated Honors floors in various other residence halls. Honors juniors and seniors may apply for the “Beyond the Classroom” program to live in the apartment-style housing in South Campus Commons.

Qualified first-year entering students are invited into Honors; transfer students with between 12 and 30 credits (excluding AP credits) will be considered for admission. Transfer students with more than 30 credits transferring from an Honors program in their previous school should contact the University Honors Program for information about campus Honors opportunities. Most departmental and college Honors programs begin in the junior year. Please contact departments or colleges directly for admission requirements.

For more information, write Director, University Honors Program, Anne Arundel Hall, University of Maryland, College Park, Md., 20742, or call 301-405-6771.

**Gemstone**

0102 Ellicott Hall

[www.gemstone.umd.edu](http://www.gemstone.umd.edu)

Faculty Director: Dr. James Wallace

The Gemstone Program at the University of Maryland is a unique interdisciplinary four-year research program for top undergraduate honors students of all majors. Under guidance of faculty mentors and Gemstone staff, students design, direct and conduct significant research exploring the interdependence of science and technology with society. Gemstone students are members of a living-learning community comprised of fellow students, faculty and staff who work together to enrich the undergraduate experience. Students work cooperatively in diverse environments in which they are

## 152 Pre-Professional Programs

challenged and supported in the development of their research, teamwork, communication and leadership skills. In the fourth year students present their project in the form of a thesis to leaders in the field and complete the program with a citation and a tangible sense of accomplishment.

Under the guidance of a faculty mentor, each Gemstone team focuses its research on challenges associated with technological innovation and society from historical, sociological and economic perspectives. The interdisciplinary nature of the teams enables examination of topics that explore the interdependence of science and technology with society from diverse perspectives. Additionally, students enroll in two-credit research seminars where each team meets regularly with the faculty mentor.

Current Gemstone senior project topics vary widely, and include the sustainability of fish on the Patuxent River, an assessment of the efficacy of state standardized exams from the classroom, a corrections alternative for non-violent offenders, sex education in Maryland, the current state of non-lethal technology, empowering women in Africa against AIDS, and researching location and date management for tracking and recovering individuals, equipment and systems.

The culmination of the four-year project is a substantial team thesis completed in the senior year. The thesis contains a background analysis of the topic, the design, testing, and implementation of the research, as well as a description of the proposed solution. At the end of the senior year, each team presents and defends their thesis at the Team Thesis Conference to invited discussants made up of experts in the area of study. Upon the successful completion of the team thesis and the presentation at the Team Thesis Conference, the students earn a Gemstone Citation.

For additional information, please write Gemstone Program, 0102 Ellicott Hall, University of Maryland, College Park, MD, 20742 or call 301-405-8047.

### Honors Humanities

For information, please see College of Arts and Humanities entry in chapter 6.

### College Park Scholars Program

1125 Cumberland Hall, (301) 314-CPSP (2777)

[www.scholars.umd.edu](http://www.scholars.umd.edu)

Executive Director: Greig Stewart

College Park Scholars is an innovative two-year living/learning program for academically talented students. Admission is by invitation. Upon admission to the program, College Park Scholars choose one of the multidisciplinary academic programs as a focus, and have an opportunity to live together with other students in that program in specially designated Scholars' residence halls. Twelve programs are currently being offered:

#### Advocates for Children

#### American Cultures

#### Arts

#### Business, Society, and the Economy

#### Earth, Life, and Time

#### Environmental Studies

#### International Studies

#### Life Sciences

#### Media, Self, and Society

#### Public Leadership

#### Science, Discovery, and the Universe

#### Science, Technology, and Society

Students in each program attend weekly, faculty-led colloquia focused on thematic topics related to their Scholars' program. The colloquia are interactive, engaging students in discussion and debate with prominent experts in various fields. Students also have an opportunity to enroll in specially designed sections of the first-year writing courses. The various College Park Scholars curricula allow students to fulfill their general education (CORE) requirements by choosing courses with their theme in mind. Every program has an experiential learning component; Scholars choose from independent research projects with their faculty mentors, service learning projects, and a variety of internships both on and off campus.

The College Park Scholars' residence halls form a collaborative living/learning community where students meet faculty in their offices, organize study groups on their floors, and join guest speakers for dinner in the dining hall. A diverse student population enriches all the Scholars' experiences, and directors encourage students with different experiences and backgrounds to take leadership roles in both the curricular and extracurricular programs. In addition, students in all the programs are offered opportunities to participate in faculty-led study abroad experiences between semesters or during the summer.

College Park Scholars are encouraged to take advantage of global access to information through the Internet and World Wide Web connections available in the residence halls. Students use internet resources to communicate with their faculty directors, other students, and experts and data from across the country and around the world.

At the successful completion of the Scholars curriculum, students receive a College Park Scholars citation on their transcript. Then, in their junior year, College Park Scholars have an opportunity to apply to departmental or college honors programs.

For more information on any of the programs identified above, please write to Executive Director, College Park Scholars, 1125 Cumberland Hall, University of Maryland, College Park, MD 20742-9331, or call (301) 314-2777.

### Individual Studies Program (IVSP)

1117 Hornbake Library, (301) 314-9403

IVSP Coordinator: Jeff Kniple

The Individual Studies Program provides an opportunity for students to create and complete individualized majors. To be accepted into the program a student must:

- 1) have a clearly-defined academic goal which cannot reasonably be satisfied in an existing curriculum at College Park;
- 2) be able to design, with faculty assistance, a sequence of courses and other learning experiences which is judged to have adequate substance for the awarding of a degree in the special field of study; and
- 3) have at least a 2.0 GPA and earn a minimum grade of C in designated major courses.
- 4) complete a detailed plan of study (prospectus) which is signed off by their faculty mentor and approved by the IVSP Faculty Review Board

Most IVSP majors are either a form of "area study" utilizing offerings from many departments, or a clear combination of two or more disciplines. Many include internships or independent study projects in the program. All work is done under the supervision of a faculty adviser.

Applicants are required to write a detailed prospectus outlining their proposed program of study. They must meet the general education requirements according to year of entry. The process of applying often involves considerable consultation and several drafts of a prospectus, so it should be begun as early as possible. Students may be admitted to the Individual Studies Program after completion of 30 college credits (15 of which must be at the University of Maryland College Park), and must be officially approved by the Individual Studies Faculty Review Committee prior to the final 30 credits. Individual Studies programs must be approved before students can declare Individual Studies as a major.

Individual Studies provides three courses specifically for its majors: IVSP 317A one-credit progress report graded Satisfactory/Fail; IVSP 318, an independent study course which students can use for a variety of out-of-class internship and research opportunities (a variable-credit course, it may be taken for a total of nine credits towards the degree); and IVSP 420, Senior Paper/Project, required for all students during the final semester. The project is evaluated by three faculty members.

More information on requirements and procedures is available from Jeff Kniple, IVSP Coordinator, 1117 Hornbake Library, (301) 314-9403 or (301) 314-9881.

Course Code: IVSP

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## PRE-PROFESSIONAL PROGRAMS

**Pre-Dental Hygiene, Pre-Dentistry, Pre-Biomedical Science Research and Medical Technology, Pre-Law, Pre-Medicine, Pre-Nursing, Pre-Occupational Therapy, Pre-Optometry, Pre-Pharmacy, Pre-Physical Therapy, Pre-Physician Assistant, Pre-Podiatric Medicine, Pre-Veterinary Medicine)**

## Law and Health Professions Advising Office Division of Letters and Sciences

Assistant Director for Pre-Professional Advising: Michael Ulrich, Ph.D.  
0110 Hornbake Library, (301) 405-2793, Preprof@deans.umd.edu  
Health Professions Advisors: Michael Ulrich, Ph.D., Christopher Mays  
Law Advisor: Tiffanee L. Dykes, J.D., M.P.M.  
[www.ltsc.umd.edu](http://www.ltsc.umd.edu)

### General Information

Pre-professional programs are designed to provide the necessary academic and experiential foundation required for entrance into professional schools. Some students may be admitted to professional programs after two to three years of study but most students begin professional school only after the completion of a bachelor's degree. These students apply to professional school at the end of their third and beginning of their fourth year. Other students apply after they have graduated from the University and obtained additional experiences.

All pre-professional programs are advisory ONLY and, except in certain limited circumstances as described herein, these programs may not be declared as the official undergraduate major. No specific major is required, favored, or preferred by professional schools. Popular majors for each of the pre-professional areas have been indicated in some of the subcategories. The pre-professional advisors can provide guidance concerning the choice of major. Undecided students may enter the Division of Letters and Sciences until they select a major.

Of particular interest to health professions students, the University of Maryland offers the opportunity to complete courses required for admission into professional programs. However, the University of Maryland does not offer an academic degree (nor certificate/diploma) in any of the aforementioned pre-professional areas. Students who intend to apply to a professional school must adhere to the policy set forth by the University of Maryland which states that students have until the accumulation of 56 credits to declare a degree granting major.

Successful completion of a pre-professional program at the University of Maryland does not guarantee admission to any professional school. Each professional school has its own admissions requirements and criteria, which may include: successful completion of preparatory courses, grade point average, scores on admissions tests, experiential activities, interview, letters of recommendation, and an evaluation from the pre-professional advisor. For specific admissions requirements, the student is urged to study the catalog of each professional school to which they will be applying. Students applying to health professions schools are typically required to attain practical experience in their chosen field; some form of community service is highly recommended. Students who engage in research, campus leadership and other experiential activities are also viewed favorably. Students applying to law school are strongly encouraged to be involved in experiential activities outside of the classroom. Such activities are not limited to work in a law firm or government agency but also may include campus leadership, research opportunities and community service.

All students are welcome to use the Law and Health Professions Advising Office in 0110 Hornbake for information on careers and professional schools across the country.

### Pre-Dental Hygiene

Advisor: Chris Mays

Please read the General Information concerning pre-professional programs under the Pre-Professional Programs subcategory.

The Pre-Dental Hygiene program is designed to prepare students for entrance into a professional curriculum for Dental Hygiene at institutions that offer Bachelor of Science in Dental Hygiene programs. **Pre-Dental Hygiene is not intended as a Pre-Dental major.** Pre-Dental Hygiene is not a degree-granting program at the University of Maryland, College Park.

A Baccalaureate degree program for a Bachelor's of Science in Dental Hygiene (BS-DH) follows a 2+2 model program. Students may complete two years of prerequisite courses at the University of Maryland, College Park, and then apply for admission into a professional school to complete two years of professional coursework, which includes classroom, laboratory, and clinical education.

University of Maryland students also have the option of completing a four-year degree at College Park in their selected major, in addition to completing dental hygiene prerequisites. This is the 4+2 model program. In this case, students who complete degree requirements in their chosen

major as well as the pre-dental hygiene prerequisites, would have a degree from the University of Maryland, College Park in their chosen major in addition to the professional school prerequisites necessary for entrance into a professional dental hygiene program. Upon completion of a professional dental hygiene program, the student would be conferred a Bachelor's of Science in Dental Hygiene degree from said program.

Popular majors for students interested in dental hygiene include biology, health, and nutrition and food science. However, any major is suitable as long as all prerequisite courses are completed. The Health Professions advisors will assist students in making an appropriate major selection.

Prerequisites of professional schools are subject to change; therefore, students are strongly encouraged to contact professional programs for the most current requirements. Contact the American Dental Hygienists' Association or the American Dental Association for specific information about individual BS-DH program prerequisites. Students may also visit the Health Professions resource library in 0110 Hornbake for professional school information. Admission to professional schools is competitive and is not guaranteed by the University of Maryland, College Park. Note: The University of Maryland at Baltimore offers a professional-level dental hygiene program.

American Dental Hygienists' Association 444 N. Michigan Avenue, Suite 3400 Chicago, IL 60601 <a href="http://www.adha.org">www.adha.org</a>	American Dental Association 211 E. Chicago Avenue Chicago, IL 60611-2678 <a href="http://www.ada.org">www.ada.org</a>
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Some prerequisite courses usually required by most professional phase Dental Hygiene programs include, but are not limited to:

- General Biology
- Human Anatomy and Physiology
- Inorganic and Organic Chemistry
- Microbiology
- Principles of Nutrition
- Public Speaking
- English Composition
- Statistics
- Introduction to Sociology
- Introduction to Psychology

### Pre-Dentistry

Advisor: Michael Ulrich, Ph.D.

The pre-professional program for pre-dental students is a program of advising for students preparing to apply to dental school. The advice is based on requirements and recommendations of American dental schools and the requirements for a baccalaureate degree at the University of Maryland.

The recommendations made during advising are meant to prepare the student to take the Dental Admissions Test (DAT), typically in the spring of the junior year or the following summer. Application to dental school is made during the summer-fall of the senior year. In addition to faculty letters of recommendation, most admissions committees request or require an evaluation from the student's pre-dental advisor. It is important, therefore, for the student to contact the pre-dental advisor early in their academic career and become familiar with the proper procedures necessary in the evaluation and application process. Students applying to health professions schools are typically required to attain practical experience in their chosen field; some form of community service is highly recommended. Students who engage in research, campus leadership and other experiential activities are also viewed favorably.

For more information on the pre-dental advising program, contact Dr. Michael Ulrich, Ph.D., in 0110 Hornbake Library, University of Maryland, College Park, MD, 20742, (301) 405-2793.

There are two ways to prepare for admission to dental school: a four-year program is preferable, but a three-year program is possible for exceptionally qualified candidates.

### Four-Year Baccalaureate Program

Most pre-dental students at the University of Maryland complete a four-year undergraduate degree prior to entrance into dental school. Students are encouraged to pursue a diversified curriculum, balancing humanities, social sciences and fine arts courses with science and mathematics courses. Students are encouraged to pursue a diversified curriculum, balancing humanities courses with science and mathematics courses. Courses that allow students to work with their hands are also encouraged. No specific major is required, favored, or preferred by dental school admissions committees.

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The four-year student will plan an undergraduate experience that includes courses to satisfy major and supporting area requirements, general education requirements, and the dental school admission requirements. The student's academic advisor will advise about the first two topics, while the Pre-Dental Advisor will advise about dental school admission requirements.

Although specific admissions requirements vary somewhat between dental schools, the undergraduate courses that constitute the basic admission requirements and prepare the student for the DAT are the following:

	<b>Semester Credit Hours</b>
ENGL 101 and 391-395- English Composition .....	3,3
CHEM 103,113- General Chemistry I, II .....	4,4
CHEM 233, 243 or 235, 245 -Organic Chemistry I, II .....	4,4
PHYS 121, 122 or 141, 142- Physics I, II .....	4,4
BSCI 105,230 -Biology* .....	4,4

\*Although the minimum biology requirement is eight credits, the successful applicant will have more, including advanced training in biological sciences at the 300- to 400-level, especially Microbiology. Courses intended for non-Life Science majors may not be taken to meet this requirement. It should also be noted that some schools of dentistry require calculus. Additionally, some but not all dental schools require a year of psychology.

### Three Year Arts-Dentistry Degree Program

At the end of the second year and the beginning of their third year, students whose performance during the first two years is exceptional may consider applying to the University of Maryland School of Dentistry. These students begin their application after two years of college work rather than first completing the usual three. By the end of the third year at College Park, the student must have earned 90 academic credits, the last 30 of which must have been earned in residence. Within the 90 credits, the student must have completed all the general education requirements. In addition, because there are certain basic admission requirements that also prepare the student for the Dental Admissions Test, the 90 credits would include the following:

	<b>Credit Hours</b>
CHEM 103,113- General Chemistry I, II .....	4,4
CHEM 233, 243 or 235, 245 -Organic Chemistry I, II .....	4,4
PHYS 121, 122 or 141, 142- Physics I, II .....	4,4
BSCI 105,230 -Biology* .....	4,4

\*Although the minimum biology requirement is eight credits, the successful applicant will have more, including advanced training in biological sciences at the 300- to 400-level, especially Microbiology. Courses intended for non-Life Science majors may not be taken to meet this requirement. It should also be noted that some schools of dentistry require calculus. Additionally, some but not all dental schools require a year of psychology.

Incoming students interested in this three-year combined degree program are strongly urged to consult the pre-dental advisor before registration for the first semester at the University of Maryland.

Students accepted in the combined arts-dentistry program receive the B.S. degree (Arts-Dentistry) after satisfactory completion of the first year at the University of Maryland School of Dentistry upon the recommendation of the Dean of the School of Dentistry and approval of the University of Maryland. The University of Maryland awards the Bachelor of Arts degree in August following the first year of dental school. The courses of the first year of dental school constitute the major; the courses listed above constitute the supporting area.

Participation in the combined degree program at the University of Maryland in no way guarantees admission to the University of Maryland School of Dentistry. Third-year students compete with fourth-year students for admission. It is therefore desirable to ensure that the work of the first three years be selected in such a way that the requirements of one of the normal University of Maryland majors can be completed.

### Pre-Law

Advisor: Tiffanee L. Dykes, J.D., M.P.M.

Most law schools require applicants to have received a Bachelor's degree; however, in some cases law schools will consider truly outstanding applicants with only three years of academic work. Law schools generally do not require prerequisite courses for admission into their programs, but do require that the student follow one of the standard programs offered at their undergraduate institution. Law schools require that the applicant take the Law School Admission Test (LSAT). It is recommended that students take the LSAT in the June preceding their junior year or in the October during their senior year, in order that there is enough time to complete applications prior to law schools' posted deadlines.

### Four-Year Baccalaureate Program

No particular undergraduate major or undergraduate courses are necessary to gain admission into law school. Students are free to select any of the major programs offered at the University of Maryland, College Park. Students are encouraged to choose a major in which they have a strong interest and expect to perform well. Course selections should be guided by the need to develop skills that are essential in preparing to perform well in law school, on the LSAT, and ultimately as a lawyer. These skills include imaginative and coherent thinking, critical reasoning, accurate and perceptive reading, and a strong command of the spoken and written language, including grammar.

### Three Year Arts/Law Degree

Tiffanee L Dykes, J.D., M.P.M.

The University of Maryland, College Park has cooperative agreements with the University of Maryland School of Law, and the University of Baltimore Law School (both located in Baltimore, Maryland) that allows students at College Park enrolled in any recognized major and who meet certain qualifications to enter law school BEFORE OBTAINING A BACCALAUREATE DEGREE. The Three Year Arts/Law Degree Program is for students with exceptional records who are accepted to the aforementioned law schools following their third year of baccalaureate level course work. Upon satisfactory completion of the first year in law school, students will be awarded their baccalaureate degree in Arts/Law from the University of Maryland, College Park.

Students applying to the Arts/Law Program will remain in a regular College Park major until formal notification from the law school is received that the student has been accepted. Upon submission of a copy of the student's letter of acceptance to the law school with the Law Advisor, the student's records will be transferred to the Division of Letters and Sciences, thereby allowing the student to participate in the program. **Students must inform the Law Advisor and their major department in writing of their intention to participate in this program prior to applying to the law schools. Receipt of this notification from their major department must be sent to the Law Advisor. The decision concerning admission into the Arts/Law program is made by the law schools.**

### Qualifications

Qualifications that must be completed **BEFORE** the beginning of the first semester of law school are:

1. **At least 90 credits (30 of which must be earned at College Park).**
2. **All university and core-requirements.**
3. **18 credits in one department applicable to a recognized major with at least 6 of those credits at the 300-400 level.**
4. **A minimum grade of "C" achieved in major courses.**

Students who fulfill the above requirements may apply directly to the University of Maryland School of Law or the University of Baltimore Law School. The optimal time for the LSAT with this program is either June preceding the students' Junior year or October during the students' Senior Year. Application to the respective law school is then made in Fall of the Junior year.

If accepted by the law school, the student begins law school without an undergraduate degree. Upon successful completion of the first year of law school; the student must provide College Park an official transcript of the first year of law school and apply for a degree. The credits earned during the first year of law school are treated as if they had been earned here at College Park. **Only grades of "C" or better will be transferred from the law school as credit towards the baccalaureate degree.** With the total number of credits being at least 120, the student will be issued a baccalaureate degree certifying completion of the "Arts/Law" program.

This accelerated plan is only available with Maryland System schools and will not be an appropriate choice for all students. Students considering this program should contact the The Division of Letters and Sciences, Law and Health Professions Advising Office for more information (301) 405-2793.

### Pre-Bio Medical Science Research and Medical Technology

Advisor: Chris Mays

Please read the General Information concerning pre-professional programs under the Pre-Professional Programs subcategory.

The pre-biomedical science research and medical technology program is designed to prepare students for entrance into the professional curriculum for medical technologists and biotechnologists. Pre-Medical Technology is not a degree-granting program at the University of Maryland, College Park.

A Baccalaureate degree program for a Bachelor's of Science in Medical Technology (BS-MT) generally follows a 2+2 model program. Students may complete two years of prerequisite courses at the University of Maryland, College Park and then apply for admission into a professional school to complete two years of professional coursework, which includes classroom, laboratory, and clinical education.

University of Maryland students also have the option of completing a four-year degree at College Park in their selected major, in addition to completing medical technology prerequisites. This is the 4+2 model program. In this case, students who complete degree requirements in their chosen major as well as the pre-medical technology prerequisites, would have a degree from the University of Maryland, College Park, in their chosen major in addition to the professional school prerequisites necessary for entrance into a professional medical technology program. Upon completion of a professional medical technology program, the student would be conferred a Bachelor's of Science in Medical Technology degree from said program.

Popular majors for students interested in medical technology include biology, cell and molecular biology, chemistry, and microbiology. However, any major is suitable as long as all prerequisite courses are completed. The Health Professions advisors will assist students in making an appropriate major selection.

Prerequisites of professional schools are subject to change; therefore, students are strongly encouraged to contact professional programs for the most current requirements. Contact the American Society of Clinical Pathologists or the National Accrediting Agency for Clinical Laboratory Sciences for specific information about individual BS-MT program prerequisites. Students may also visit the Health Professions resource library in 0110 Hornbake for professional school information. Admission to professional schools is competitive and is not guaranteed by the University of Maryland, College Park. **Note:** The University of Maryland, Baltimore offers a professional-level medical technology program.

American Society of  
Clinical Pathologists  
2100 West Harrison Street  
Chicago, IL 60612  
312-738-1336  
www.ascp.org

National Accrediting Agency for Clinical  
Laboratory Sciences  
8410 W. Bryn Mawr Ave., Suite 670  
Chicago, IL 60631

Some prerequisite courses usually required by most professional phase Medical Technology programs include, but are not limited to:

General Biology  
Human Anatomy and Physiology  
Inorganic and Organic Chemistry  
Microbiology  
Statistics  
English Composition  
Humanities Courses  
Behavioral & Social Science Courses

### Pre-Medicine (Allopathic and Osteopathic)

Advisor: Michael Ulrich, Ph.D.

The recommendations made during advising are meant to prepare the student to take the Medical College Admissions Test (MCAT), typically in the spring of the junior year or the following summer. The advice is based on requirements and recommendations of American medical schools and the requirements for a bachelor's degree at College Park. The pre-medical advisor is prepared to assist students in setting career objectives, selecting undergraduate course work to meet the admissions criteria of the professional schools, and in all phases of the application process itself.

The recommendations made during advising are meant to prepare the student to take the Medical College Admission Test (MCAT) in the spring of the junior year or the following summer. Application to medical school is made during the summer-fall of the senior year. Medical school admissions committees generally request or require an evaluation from the student's pre-medical advisor. It is important, therefore, for the student to contact the pre-medical advisor early in the academic career and to become familiar with the proper procedures necessary in the evaluation and application process. Students applying to health professions schools are typically required to attain practical experience in their chosen field; some form of community service is highly recommended. Students who engage in research, campus leadership and other experiential activities are also viewed favorably.

For more information on the pre-medical advising program, contact the Pre-Medical Advisor, 1117/0110 Hornbake Library, The University of Maryland, College Park, MD 20742, (301) 405-2793.

### Four-Year Baccalaureate Program

Most pre-medical students at College Park complete a four-year undergraduate degree prior to entrance into medical school. Students are encouraged to pursue a diversified curriculum, balancing humanities, social sciences and fine arts courses with science and mathematics courses. No specific major is required, favored, or preferred by medical school admissions committees.

The four-year student will plan an undergraduate experience that includes courses to satisfy major and supporting area requirements, general education requirements, and the medical school admission requirements. The student's academic advisor will advise about the first two topics, while the pre-medical advisor will advise about medical school admission requirements.

Although specific admission requirements vary somewhat from medical school to medical school, the undergraduate courses that constitute the basic admission requirements and prepare the student for the MCAT are the following:

	<b>Semester Credit Hours</b>
ENGL 101 and 391-395- English Composition .....	3,3
CHEM.103,113 -General Chemistry I, II .....	4,4
CHEM 233,243 or 235,245 -Organic Chemistry I, II .....	4,4
PHYS 121, 122 or 141, 142- Physics I, II .....	4,4
MATH 220,221, or 140,141 -Calculus I, II* .....	3,3
BSCI 105,230 -Biology* .....	4,4

\*Although the minimum biology requirement is eight credits, the successful applicant will have more, including advanced training in biological sciences at the 300- to 400-level, especially biochemistry. Courses intended for non-Life Science majors may not be taken to meet this requirement. It should also be noted that many schools of medicine require one semester of mathematics (Calculus) and a few require two semesters.

### Early Selection Program

University of Maryland students who meet the criteria and are accepted for the Early Selection Program must enroll at The George Washington University School of Medicine and Health Sciences. The decision to accept a qualified student into the program will be made by The George Washington University School of Medicine and Health Sciences. Selected-sophomore students (rising juniors, when the selection is completed) are nurtured through their undergraduate experience at the University of Maryland. Upon successful completion of the undergraduate program and all delineated requirements, students are guaranteed admissions to The George Washington University School of Medicine and Health Sciences for a four-year program towards a M.D. degree.

Competitive students for the program must demonstrate high academic achievement in both science and non-science curriculum. To be eligible, a student has to have achieved a minimum 3.0 overall GPA and no science grade lower than a B- by the end of their third semester and have a declared academic major. Students must complete two semesters of chemistry and two semesters of biology or physics by the end of their fourth semester. To continue eligibility and an eventual contract to the M.D. program, the student must maintain a minimum 3.0 overall GPA through the completion of their undergraduate program and receive an undergraduate degree. SAT scores of 1200 or greater are generally required. Applicants must be in the second semester of their sophomore year and have completed 60 credits by the end of the semester during which they apply. Students transferring into their sophomore year at the University of Maryland are ineligible.

### Pre-Nursing

Advisor: Chris Mays

Please read the General Information concerning pre-professional programs under the Pre-Professional Programs subcategory.

The Pre-Nursing program is designed to prepare students for entrance into a professional curriculum for Nursing at institutions that offer Bachelor of Science in Nursing programs. Pre-Nursing is not a degree-granting program at the University of Maryland, College Park.

A Baccalaureate degree program for a Bachelor's of Science in Nursing (BSN) follows a 2+2 model program also known as a "Traditional Baccalaureate" program. Students may complete two years (about sixty

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credits) of prerequisite courses at the University of Maryland, College Park, and then apply for admission into a professional school to complete two years of professional coursework, which includes classroom, laboratory, and clinical education.

University of Maryland students also have the option of completing a four-year degree at College Park in their selected major, in addition to completing about twenty to twenty-five credits of nursing prerequisites. This is the "Second Degree" or "Accelerated Second Degree" model program. In this case, students who complete degree requirements in their chosen major as well as the pre-nursing prerequisites, would have a degree from the University of Maryland, College Park, in their chosen major in addition to the professional school prerequisites necessary for entrance into an accelerated BSN program. Accelerated Baccalaureate Nursing programs usually take thirteen to sixteen months to complete, whereas the Traditional Nursing programs usually take two years to complete. Upon completion of a professional nursing program, the student would be conferred a Bachelor's of Science in Nursing degree from said program.

Popular majors for students interested in nursing include biology, health, nutrition, physiology and neurobiology, and psychology. However, any major is suitable as long as all prerequisite courses are completed. The Health Professions advisors will assist students in making an appropriate major selection.

Prerequisites of professional schools are subject to change; therefore, students are strongly encouraged to contact professional programs for the most current requirements. Contact the National League for Nursing for specific information about individual nursing program prerequisites. Students may also visit the Health Professions resource library in O110 Hornbake for professional school information. Admission to professional schools is competitive and is not guaranteed by the University of Maryland, College Park. Note: The University of Maryland at Baltimore offers a professional-level nursing program.

National League For Nursing  
61 Broadway  
New York, NY 10006  
800-669-1656 or 1-212-363-5555  
[www.nln.org](http://www.nln.org)

Some prerequisite courses usually required by most professional phase, "Traditional" Nursing programs include, but are not limited to:

General Biology  
Human Anatomy and Physiology  
Inorganic and Organic Chemistry  
Microbiology  
Principles of Nutrition  
English Composition or Literature  
Mathematics  
Introduction to Psychology  
Introduction to Sociology  
Human Growth and Development

### Pre-Occupational Therapy

Advisor: Chris Mays

Please read the General Information concerning pre-professional programs under the Pre-Professional Programs subcategory.

Pre-Occupational Therapy is not a degree-granting program at the University of Maryland, College Park. The Pre-Occupational Therapy program is designed to prepare students for entrance into a professional curriculum for Occupational Therapy at institutions that offer professional advanced degrees, such as master's or doctoral degrees.

Community colleges and technical schools offer associate's degrees or certificates to students who wish to become occupational therapy assistants. Certain colleges offer Bachelor degrees in Occupational Therapy, while some schools offer combined Bachelor's and Master's degree programs.

There are several educational pathways for students who wish to enter the occupational therapy field. University of Maryland students have the option of completing a four-year degree at College Park, in their selected major, in addition to completing occupational therapy prerequisites. After completion of their bachelor's degree and the occupational therapy prerequisites, students can choose to complete a Post-Bachelor's certificate, Master of Science program, or doctoral degree program in Occupational Therapy offered by professional schools. Students should thoroughly research the different educational pathways to determine the best route for their career goals. Some states require a degree in occupational therapy prior to approving licensure to work as an occupational therapist in that state. The certificate cannot be used as a degree. You should be familiar with the laws of the state in which you wish to work if you opt to go the certificate route.

Popular majors for students interested in occupational therapy include biology, health, kinesiology, physiology and neurobiology, and psychology. However, any major is suitable as long as all prerequisite courses are completed. The Health Professions advisors will assist students in making an appropriate major selection.

Prerequisites of professional schools are subject to change; therefore, students are strongly encouraged to contact professional programs for the most current requirements. Contact the American Occupational Therapy Association for specific information about individual program prerequisites. Students may also visit the Health Professions resource library in O110 Hornbake for professional school information. Admission to professional schools is competitive and is not guaranteed by the University of Maryland, College Park.

The American Occupational Therapy Association  
4720 Montgomery Lane, P.O. Box 31220  
Bethesda, MD 20824-1220  
301-652-2682  
[www.aota.org](http://www.aota.org)

### Pre-Optometry

Advisor: Michael Ulrich, Ph.D.

Requirements for admission to schools and colleges of optometry vary somewhat, and the pre-optometry student should consult the catalogs of the optometry schools and colleges for specific admission requirements. A minimum of two years of pre-optometry studies is required for admission to all accredited schools, and about half of the schools require a minimum of three years. At present, more than two-thirds of successful applicants hold a bachelor's or higher degree. Students who contemplate admission to optometry schools may major in any program that the University offers, but would be well-advised to write to the optometry schools of their choice for specific course requirements for admission. Students applying to health professions schools are typically required to attain practical experience in their chosen field; some form of community service is highly recommended. Students who engage in research, campus leadership and other experiential activities are also viewed favorably. In general, pre-optometry students should follow a four-year baccalaureate program, which includes the following:

#### Semester Credit Hours

Biology, Microbiology and Physiology .....	4-12
ENGL 101 and 391-395 - English Composition .....	3,3
CHEM 103,113 - General Chemistry I, II .....	4 or 8
CHEM 233, 243 or 235, 245 - Organic Chemistry I, II .....	4,4
PHYS 121, 122 or 141, 142 - Physics I, II .....	4,4
Math through differential calculus .....	3, 3
BSCI 105, 230 - Biology* .....	4,4
Psychology .....	3 or 6
Statistics .....	3
Social Sciences .....	6

\*Although the minimum biology requirement is eight credits, the successful applicant will have more, including advanced training in biological sciences at the 300- to 400-level, especially Microbiology. Courses intended for non-Life Science majors may not be taken to meet this requirement. It should also be noted that many schools of medicine require one semester of mathematics (Calculus) and a few require two semesters.

For additional information on pre-optometry studies, contact the Pre-medical Advisor, 1117 Hornbake Library, the University of Maryland, College Park, MD 20742, (301) 405-2793.

### Pre-Osteopathic Medicine

Advisor: Michael Ulrich, Ph.D.

The pre-professional requirements for osteopathic medical school are essentially identical to those for allopathic medical school, and the student is referred to the pre-medicine discussion above.

For additional information on pre-osteopathy studies, contact the Pre-medical Advisor, 1117/O110 Hornbake Library, the University of Maryland, College Park, MD 20742, (301) 405-2793.

### Pre-Podiatric Medicine

Advisor: Michael Ulrich, Ph.D.

The pre-professional requirements for podiatric medical school are essentially identical to those for allopathic medical school, and the student is referred to the pre-medicine discussion above.

For additional information on pre-podiatry studies, contact the Pre-medical Advisor, the University of Maryland, 1117/0110 Hornbake Library, College Park, MD 20742, (301) 405-2793.

### Pre-Pharmacy

Advisor: Chris Mays

Please read the General Information concerning pre-professional programs under the Pre-Professional Programs subcategory.

The Pre-Pharmacy program is designed to prepare students for entrance into a professional curriculum for Pharmacy at institutions that offer a Doctor of Pharmacy (Pharm.D.) degree program. Pre-Pharmacy is not a degree-granting program at the University of Maryland, College Park.

A Doctor of Pharmacy (Pharm.D.) degree program follows a 2+4 model program. Students may complete two years of prerequisite courses at the University of Maryland, College Park and then apply for admission into a professional pharmacy school to complete four years of professional coursework, which includes classroom, laboratory, and clinical education.

University of Maryland students also have the option of completing a four-year degree at College Park in their selected major, in addition to completing pharmacy school prerequisites. This is the 4+4 model program. In this case, students who complete degree requirements in their chosen major as well as the pre-pharmacy prerequisites, would have a degree from the University of Maryland, College Park in their chosen major in addition to the prerequisites necessary for entrance into a professional pharmacy program. Upon completion of a professional pharmacy program, the student would be conferred a Doctor of Pharmacy (Pharm.D.) degree from said program.

Popular majors for students interested in pharmacy include biology, biochemistry, chemistry, microbiology, and nutrition. However, any major is suitable as long as all prerequisite courses are completed. The Health Professions advisors will assist students in making an appropriate major selection.

Prerequisites of professional schools are subject to change therefore students are strongly encouraged to contact professional programs for the most current requirements. Contact the American Association of Colleges of Pharmacy for specific information about individual Pharm.D. program prerequisites. Students may also visit the Health Professions resource library in 0110 Hornbake for professional school information. Admission to professional schools is competitive and is not guaranteed by the University of Maryland, College Park. Note: The University of Maryland at Baltimore offers a professional-level pharmacy program.

#### American Association of Colleges of Pharmacy

1426 Prince Street  
Alexandria, VA 22314-2841  
703-739-2330  
[www.aacp.org](http://www.aacp.org)

Some prerequisite courses usually required by most professional phase Pharm.D. programs include, but are not limited to:

- Inorganic and Organic Chemistry
- Physics
- General Biology
- Microbiology
- Calculus
- English Composition
- Public Speaking
- Ethics or Philosophy
- Humanities Courses
- Behavioral & Social Science Courses

### Pre-Physical Therapy

Advisor: Chris Mays

Please read the General Information concerning pre-professional programs under the Pre-Professional Program subcategory.

The Pre-Physical Therapy program is designed to prepare students for entrance into a professional curriculum for Physical Therapy at institutions that offer professional advanced degrees, such as master's or doctoral degrees. Pre-Physical Therapy is not a degree-granting program at the University of Maryland, College Park.

The track a student follows in order to obtain a Master's in Physical Therapy (MPT) degree varies depending on the professional schools to which the student intends on applying and, more importantly, the expected year of matriculation into the professional phase of Physical Therapy. Currently, the

accepted, entry-level clinical degree to practice as a Physical Therapist is the MPT. Students currently can enter Master's level professional programs by two routes. The first route or educational pathway could be completing sixty to ninety credits of prerequisites and then applying to the MPT programs for which the student has completed the requirements. The length of time to complete the Master's level coursework is about two to three years. The second route could be completing a Baccalaureate degree at the University of Maryland, College Park, in addition to the prerequisites required by individual professional schools. Students who decide on this option then complete two to three years of Master's level coursework. In both the first and second routes, the end result would be receiving a MPT from the professional school the student attends.

Many physical therapy schools are now conferring a doctoral degree on students. For these schools, University of Maryland students need to complete a four-year degree in their selected major in addition to completing physical therapy prerequisites. Some physical therapy schools also require some health care experience in the physical therapy field.

There are several educational pathways for students who wish to enter the physical therapy field. Due to the many variables in the educational pathways options as well as in the required health care experience, students are encouraged to thoroughly research this profession and determine which educational pathway is the best route to reach their particular career goals.

Popular majors for students interested in physical therapy include biology, kinesiology, physiology and neurobiology, and psychology. However, any major is suitable as long as all prerequisite courses are completed. The Health Professions advisor will assist students in making an appropriate major selection.

Prerequisites for professional schools are subject to change; therefore, students are strongly encouraged to contact professional programs for the most current requirements. Contact the American Physical Therapy Association for specific information about individual program prerequisites. Students may also visit the Health Professions Resource library in 0110 Hornbake Library for professional school information. Admission to professional schools is competitive and is not guaranteed by the University of Maryland, College Park. Note: The University of Maryland at Baltimore offers a professional-level physical therapy program.

The American Physical Therapy Association  
1111 North Fairfax Street  
Alexandria, VA 22314  
703-684-2782  
[www.apta.org](http://www.apta.org)

Some prerequisite courses usually required by most professional phase Physical Therapy programs include, but are not limited to:

- General Biology
- Human Anatomy and Physiology
- Chemistry
- Physics
- Exercise Physiology
- Pre-Calculus or Calculus
- Statistics
- Psychology
- Human Growth and Development
- Ethics of Philosophy
- English Composition
- Public Speaking
- Humanities Courses

### Pre-Physician Assistant

Advisor: Chris Mays

Please read the General Information concerning pre-professional programs under the Pre-Professional Programs subcategory.

Pre-Physician Assistant is not a degree-granting program at the University of Maryland, College Park. The Pre-Physician Assistant program is designed to prepare students for entrance into a professional curriculum at institutions that offer professional advanced degrees or post-baccalaureate certificates. At the University of Maryland, students can complete the necessary prerequisite courses required by the professional physician assistant programs to which they will be applying.

There are several educational pathways for students who wish to enter the physician assistant field. Due to the many variables in the educational pathway options, students are encouraged to thoroughly research this profession and determine which educational pathway is the best route to reach their particular career goals.

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Most physician assistant programs require applicants to have previous health care experience and some college education. The typical applicant already has a bachelor's degree and at least four years of health care experience. Commonly nurses, EMT's, and paramedics apply to PA programs. Check the particular prerequisites of the PA educational programs that interest you.

Popular majors for students interested in a career as a physician assistant include biology, physiology and neurobiology, and psychology. However, any major is suitable as long as all prerequisite courses are completed. The Health Professions advisors will assist students in making an appropriate major selection.

Prerequisites of professional schools are subject to change; therefore, students are strongly encouraged to contact professional programs for the most current requirements. Contact the American Academy of Physician Assistants for specific information about individual program prerequisites. Students may also visit the Health Professions resource library in O110 Hornbake for professional school information. Admission to professional schools is competitive and is not guaranteed by the University of Maryland, College Park.

American Academy of Physician Assistants  
950 North Washington Street  
Alexandria, VA 22314-1552  
703-836-2272  
[www.aapa.org](http://www.aapa.org)

### Pre-Veterinary Medicine

Advisers: Loizeaux, Stephenson

University of Maryland, College Park students interested in veterinary medicine are eligible for a special degree program offered through the College of Agriculture and Natural Resources. Through this program (see College of Agriculture and Natural Resources entry in chapter 6), students may earn a combined Bachelor of Sciences degree in Agriculture and Veterinary Medicine.

Students within any major also may prepare for admission to veterinary school by completing required courses. Students should consult catalogs from the veterinary schools in which they are interested. Minimum requirements for most programs include the following:

University of Maryland, College Park, CORE Requirements  
BIOL 105, 106, 222  
CHEM 103, 113, 233, 243  
BCHM 261 or 461; MICB 200  
PHYS 121 (or 141), 122 (or 142)  
MATH 220 (or 140) and 3 credits of other mathematics

Students should seek pre-veterinary advising through the Director, Center for Government and Corporate Veterinary Medicine, 1213 Avram Gudelsky Veterinary Center, University of Maryland, College Park, MD 20742-3711, (301) 935-6083, ext. 116 or 106.

## Combined Undergraduate/Graduate Programs

- A. **Arts-Law, Arts-Dentistry:** In these programs, students who have completed 90 undergraduate credits, who satisfy certain conditions, and who matriculate at the Dental or Law School of the University of Maryland, Baltimore or the Law School of the University of Baltimore, may apply the successful completion of one year of their professional training towards the completion of their baccalaureate degrees. The degrees are conferred by the Office of Undergraduate Studies with the majors as designated above. See the Undergraduate Catalog entry for Pre-Professional Programs for more details.
- B. **Animal Science/Veterinary Medicine:** Students enrolled in the College of Agriculture and Natural Resources who have completed 90 undergraduate credits, who satisfy certain conditions, and who matriculate in an accredited college of Veterinary Medicine, may apply the successful completion of thirty hours of their professional training towards the completion of their baccalaureate degrees. The degrees are conferred by the College of Agriculture and Natural Resources with the major designated above. See the Undergraduate Catalog entry for Animal Sciences for more details.
- C. **Biochemistry/Pharmacy:** Students enrolled in the Biochemistry Program who have completed 90 undergraduate credits, who satisfy certain conditions, and who matriculate in the School of Pharmacy of the University of Maryland, Baltimore may apply the successful completion

of thirty hours of their professional training towards the completion of their baccalaureate degree programs in Biochemistry. The degrees are conferred by the College of Life Sciences. See the Undergraduate Catalog entry for the Biochemistry program for more details.

## CERTIFICATE PROGRAMS

### African American Studies Certificate

#### College of Behavioral and Social Sciences

2169 LeFrak Hall, (301) 405-1158

The African American Studies Certificate program offers the opportunity to develop a specialization in African American studies while pursuing a major in another field. Certificate students learn about the social, economic, political, and cultural history of African American people through a concentration of courses (21 credit hours). Courses taken toward the certificate also may be used to satisfy CORE requirements and electives.

Undergraduates in good standing may apply for the program by contacting the academic adviser of the African American Studies Program in 2169 LeFrak Hall. Students pursuing the certificate must meet the University's general education (CORE) and department requirements.

See the complete description in the alphabetical list of programs.

### Asian American Studies Certificate

#### College of Arts and Humanities

Asian American Studies Program  
1147 Tawes Fine Arts Building, (301) 405-0996  
[www.inform.umd.edu/asam](http://www.inform.umd.edu/asam)

#### A Certificate in Asian American Studies

The Certificate program is a 21 credit-hour complimentary study component. It offers students an excellent opportunity to develop a specialization in Asian American issues while pursuing an undergraduate degree in another field. Courses are typically co-listed with other academic departments so that students are able to gain a truly interdisciplinary approach to the study of Asian American issues. Courses taken toward the certificate also may be used to satisfy CORE requirements and electives.

#### Certificate Requirements

##### CORE courses:

1. Introduction to Asian American Studies (AAST 200)
2. Asian American History and Society (AAST 201)

**Electives:** A total of 12 Elective Credits is required and can be earned by taking any of a number of special topics courses the AAST offers each semester. Elective requirements can also be satisfied through successful completion of courses offered through other programs.

Students may choose courses that focus on the experience of Asian Americans in the Media, Public Policy, Education and Counseling, Psychology, Literature, or decide to learn about the experiences and issues concerning Asian American women or immigrants. Others may choose to study the economic adjustment of Asian Americans or issues of sexuality. Specialty courses will also cover the experiences of Asian Americans during specific time periods.

#### Capstone Requirements

In order to complete the requirements of the certificate, students are expected to participate in either one of two independent experiential projects. Students can either conduct research (of interest to the student) with one of the AAST's core or affiliate faculty members or gain experience through an internship at any of the local area Asian Pacific American servicing organizations.

The independent research provides students with an opportunity to fully develop their own interest area through a guided experience with one of our faculty members. The internship option allows students to integrate their understanding of history, society, and politics with theory while gaining experience at an organization that serves the interests and needs of the Asian Pacific American community.

Anyone interested in earning the certificate must formally apply at the Asian American Studies Program office. Students may begin taking courses before they formally register for the certificate; however, they should apply for admission as soon as possible.

## East Asian Studies Certificate

### College of Arts and Humanities

2101B Francis Scott Key Hall, (301) 405-4309

The Undergraduate Certificate in East Asian Studies is a 24-credit course of instruction designed to provide specialized knowledge of the cultures, histories, and contemporary concerns of the peoples of China, Japan, and Korea. It will complement and enrich a student's major. The curriculum focuses on language instruction, civilization courses, and electives in several departments and programs of the university. It is designed specifically for students who wish to expand their knowledge of East Asia and demonstrate to prospective employers, the public, and graduate and professional schools a special competence and set of skills in East Asian affairs.

Upon satisfactory completion of the courses, with a grade of C or better in each course, and recommendation by the chairperson of the Committee on East Asian Studies, a certificate will be awarded. A notation of the award of the certificate will be included on the student's transcript. The student must have a bachelor's degree awarded by Maryland (must be College Park campus) previous to or simultaneously with an award of the certificate.

### Certificate Requirements

**CORE Courses:** The student is required to take:

1. HIST 284—East Asian Civilization I
2. HIST 285—East Asian Civilization II
3. Six semester hours of introduction to one of the following East Asian languages (Chinese, Japanese, or Korean):  
CHIN 101—Elementary Chinese I  
JAPN 101—Elementary Japanese I  
KORA 211—Introductory Reading for Speakers of Korean I  
KORA 212—Introductory Reading for Speakers of Korean II

Students with language competence equivalent to these language courses are exempted from the language requirement; such students are required to complete an additional six hours of electives in East Asian courses to fulfill the 24-credit requirement for the certificate.

**Electives:** Students must complete at least 12 hours of electives selected from four regular formally approved courses on East Asia in at least two of the following categories: (1) art history, (2) geography, (3) government and politics, (4) history, (5) language, linguistics, and literature, (6) music, and (7) women's studies. Nine of the 12 hours of electives must be upper-division (300-400 level) courses. A maximum of three credit hours of special topics courses on East Asia will be allowed with the approval of the student's certificate adviser. No more than nine credits from any one department may be applied toward the certificate. No more than nine credits applied to the student's major may also apply to the certificate. In addition, no more than nine credits of the courses applied toward the certificate may be transferred from other institutions. Students are asked to work with their adviser in ensuring that the electives maintain an intercollegiate and interdisciplinary focus (at least three disciplines are recommended).

Interested students should contact Dr. Marlene Mayo, Department of History, Francis Scott Key Hall, [mm32@umail.umd.edu](mailto:mm32@umail.umd.edu).

## Certificate in International Agriculture and Natural Resources

The Certificate in International Agriculture and Natural Resources is designed to enrich a student's major with a global perspective. The required courses focus on: language instruction; international aspects of the environment, agricultural production, development and sustainability, nutrition, and business; an experience abroad; and a capstone course regarding the student's travel abroad. Any student in good academic standing may participate in the certificate program.

### Requirements for Certificate

The certificate requires at least 21 credits that may include courses taken toward other degree and CORE requirements. Upon successful completion of the courses, with a grade of C or better in each course and a recommendation of the Associate Dean of the College of Agriculture and Natural Resources, a certificate will be awarded. A notation of the award of

the certificate will be included on the student's transcript. In order to receive the certificate, students must have completed all requirements for a bachelor's degree.

### Foreign Language

6-8 credits in a foreign language

### International Courses

At least 9 credits from the following list of courses, at least 3 of these courses must be in the College of Agriculture and Natural Resources for students not majoring in a program outside of the College of Agriculture and Natural Resources:

PLSC 303—International Crop Production  
NRSC 440—Crops, Soils, and Civilization  
AREC 365—World Hunger, Population, and Food Supplies  
AREC 433—Food and Agricultural Policy  
BMGT 392—Introduction to International Business Management  
BMGT 390—Competing on Quality in a Global Economy  
BSCI 365—International Pesticide Problems and Solutions  
GEOG 434—Agriculture and Rural Development  
NFSC 425—International Nutrition  
AREC 445—Agricultural Development, Population Growth, and the Environment  
ECON 440—International Economics  
GVPT 306—Global Ecopolitics  
GEOG 422—Population Geography

### Travel Study or Travel Abroad

Three to four credits of travel study or study abroad. Prerequisite: to have completed the foreign language course work. Prerequisite or co-requisite: six credits from the International Courses List. In order to qualify for the certificate, travel study and study abroad experiences require prior approval of Associate Dean of the College of Agriculture and Natural Resources. For approval, travel experience must demonstrate significant learning opportunities in areas related to agriculture and natural resources and cultural immersion.

### Travel Study Seminar

1 credit Travel Study Seminar. Prerequisite: completion of the travel study requirement.

This course will require student presentation of their travel experience including a paper, a poster presentation, as well as an oral presentation and discussion.

## Latin-American Studies Certificate

### College of Arts and Humanities

Latin-American Studies Center  
4205 Jimenez Hall, (301) 405-6456

The new multidisciplinary certificate program in Latin-American Studies is open to University of Maryland, College Park undergraduates in any major who are interested in international studies and Latin America. The undergraduate Certificate in Latin-American Studies will be awarded to students who have completed 21 credits with a grade of C or better in the following areas.

### Requirements for Certificate

#### A. Core curriculum for all certificate students (12 credits)

LASC/SPAN/PORT 234 Issues in Latin-American Studies I  
LASC/SPAN/PORT 235 Issues in Latin-American Studies II  
HIST 250 or HIST 251 Latin American History I or II  
LASC/SPAN/PORT 458 Senior capstone course in Latin-American Studies

#### B. Additional courses in Latin-American Studies (9 credits)

Nine credits is additional courses to be chosen from an approved list and from at least two different departments. At least six credits must be at the 300- or 400-level. See Latin-American Studies adviser for details.

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### C. Foreign Language Competency

All certificate students must demonstrate their competence in either Spanish or Portuguese. Competency may be proven with a grade of C or better in an intermediate-level course (PORT 203, SPAN 201) or higher. Native speakers of Spanish or Portuguese or students with extensive experience in these languages should consult with the Latin-American Studies adviser.

Interested students should contact Dr. Eyda Merediz, 2225 Jimenez Hall, by phone, (301) 405-6459, or by e-mail ([emerediz@wam.umd.edu](mailto:emerediz@wam.umd.edu)); or contact Christina Guidorizzi in the Latin-American Studies Office, 4205 Jimenez Hall, by phone (301) 405-6459 or by e-mail [guido@wam.umd.edu](mailto:guido@wam.umd.edu).

### Lesbian, Gay, Bisexual and Transgender (LGBT) Studies Certificate

#### Undergraduate Studies

1147 Tawes Fine Arts Building, (301) 405-5428  
[www.lgbts.umd.edu](http://www.lgbts.umd.edu) email: [lgbts@umail.umd.edu](mailto:lgbts@umail.umd.edu)

The Program in Lesbian, Gay, Bisexual and Transgender (LGBT) Studies offers an interdisciplinary undergraduate certificate designed to examine the lives, experiences, identities and representations of LGBT persons, those who are today described as having a minority sexual orientation or who are gender transgressive. Students study LGBT families and communities, cultures and subcultures; histories, institutions, languages and literatures; economic and political lives; and the complex relations of sexual minorities to the culture and experience of the gender conformant and (hetero)sexual majority. LGBT Studies is an interdisciplinary and multidisciplinary field, and promotes the application of new theories and methodologies (e.g., queer, feminist, critical race, and multicultural theories) to established disciplines, and it advances the generation of new knowledge within traditional fields of scholarship. Through study of sexual minorities, students gain an understanding of and respect for other differences in human lives such as age, ability, class, ethnicity, gender, race, and religion. With their faculty advisors, certificate candidates design a program that complements their major field of study.

#### Requirements for the Certificate

##### A. Core curriculum for the LGBT Certificate (15 credits)

1. LGBT200—Introduction to Lesbian Gay Bisexual Transgender Studies
2. One of the following.
  - a. CMLT291 International Perspectives on Lesbian and Gay Studies
  - b. ENGL265—Introduction to Lesbian, Gay, and Bisexual Literature
3. One of the following.
  - a. LGBT350 LGBT People and Communication
  - b. PHIL407 Gay and Lesbian Philosophy
  - c. WMST494 Lesbian Communities and Differences
4. One of the following.
  - a. ENGL359 Special Topics in Lesbian, Gay, and Bisexual Literatures
  - b. ENGL459 Selected Topics in Sexuality and Literature
  - c. ENGL465 Theories of Sexuality and Literature
5. One of the following.
  - a. LGBT488—Seminar in LGBT Studies
  - b. LGBT386—Supervised Internship - LGBT Community Organizations

##### B. Electives (6 credits)

Students choose 6 hours of elective credits in consultation with their advisor in LGBT Studies. At least 3 hours of elective credits must be from upper division courses (i.e., those numbered 300 or above). Electives are chosen to complement the student's knowledge of LGBT people and issues by exploring disciplines that contrast with the major field of study. Elective courses may be chosen from the list of core courses above or from a list of approved courses. A student may also petition to have any other course fulfill this requirement by providing evidence, usually the syllabus, that a substantial amount of the course work, usually including a term paper, consists of LGBT material.

### Science, Technology and Society Certificate

1108 Chestertown Hall, 301-405-0527  
[www.sts.umd.edu/certificate](http://www.sts.umd.edu/certificate)

#### Certificate Requirements:

The Science, Technology, and Society (STS) Undergraduate Certificate program offers students an excellent opportunity to advance their understanding of the complex relationships between science, technology, and society by concentrating their CORE and elective courses (like a college "minor"). STS courses have been carefully chosen to fit closely into CORE and major field requirements of most students. Therefore, almost all College Park undergraduates can fulfill the certificate requirements without taking additional courses by careful selection of the courses that fulfill their CORE and elective requirements.

The STS Certificate program is comprised of 21 credits of coursework (including a capstone course), a monthly colloquium, and an internship opportunity. This mixture of learning experiences helps to cultivate an intellectual and personal forum in which students and faculty can work closely together. This program provides students with an interdisciplinary thematic link for their general education requirements, and it offers a chance for mentored research in areas of personal interest.

#### Certificate Requirements

21 credits are necessary to complete the STS Certificate: 9 credits of Fundamental Courses and 12 credits of Elective Courses.

##### Fundamental Courses (9 credits):

- A natural science or technology course satisfying CORE or a major and approved by the program director
- An introductory history of science and technology course (see program website)
- The senior STS capstone course (UNIV 401)

##### Elective Courses (12 credits):

- Students can choose from a list of over sixty approved courses representing a variety of topic areas relevant to the STS field from a host of disciplines (e.g., AMST, AREC, CPSP, ECON, GEMS, GVPT, HIST, HONR, MICB, NRSC, PHIL, SOCY, ZOOL). Over half of the electives also satisfy CORE Distributive Studies requirements. Two of the electives must be upper-level courses. (Please note: CORE Advanced Studies requires that two upper-level courses be taken outside the major after 56 credits. Upper-level STS courses satisfy this requirement. Check with your academic advisor in your major.) See program website for the complete list of electives.

Students must obtain advice and approval from the program director for their course choices. Students must maintain a minimum grade of "C" in each STS course. The STS program of study must include a minimum of 9 credits in upper division courses, 2 of which must be electives. It also may not exceed the following maximums: 9 credits of STS courses applied to the student's major; 3 credits of "Special Topics" or "Selected Topics" courses applied to the STS certificate; 9 credits of approved courses taken outside UMCP. Only 6 credits from courses with the AREC, ECON and GVPT prefixes may be used to satisfy the STS Certificate requirements.

### Women's Studies Certificate

#### College of Arts and Humanities

2101 Woods Hall, 301-405-6877  
[www.umd.edu/wmst](http://www.umd.edu/wmst)

See Women's Studies Department for faculty roster.

The Women's Studies Certificate Program consists of an integrated, interdisciplinary curriculum on women that is designed to supplement a student's major. Any student in good standing may enroll in the certificate program by declaring her/his intention to the Women's Studies Undergraduate Advisor. For additional information contact the Women's Studies office, (301) 405-6827.

## Requirements for Certificate

To qualify for a certificate in Women's Studies, a student will be required to earn 21 credits in Women's Studies courses, nine of which must be at the 300/400 level. No more than three credit hours of special topics courses may be counted toward the certificate. No more than nine credits which are applied toward a major may be included in the certificate program. No more than nine credit hours may be taken at institutions other than the University of Maryland. Each student must obtain a grade of C or better in each course that is to be counted toward the certificate. Of the 21 credits, courses must be distributed as follows:

### 1. Foundation Courses (9 credit hours)

WMST 200—Introduction to Women's Studies: Women and Society .....	(3)
OR	
WMST 250—Introduction to Women's Studies: Women, Art & Culture ...	(3)
WMST 400—Theories of Feminism .....	(3)
WMST 488—Senior Seminar .....	(3)

### 2. Distributive Courses

#### Area 1: Arts and Literature (3 credit hours)

WMST 241—Women Writers of French Expression in Translation (X-listed as FREN241) .....	(3)
WMST 250—Introduction to Women's Studies: Women, Art, and Culture .....	(3)
WMST 255—Introduction to Literature by Women (X-listed as ENGL255) .....	(3)
WMST 275—World Literature by Women (X-listed as CMLT 275) .....	(3)
WMST 281—Women in German Literature and Society (X-listed as GERM281) .....	(3)
WMST 348—Literary Works by Women (X-listed as ENGL348) .....	(3)
WMST 408—Special Topics in Literature by Women before 1800 (X-listed as ENGL 408) .....	(3)
WMST 444—Feminist Critical Theory (X-listed as ENGL 444) .....	(3)
WMST 448—Special Topics in Literature by Women of Color* (X-listed as ENGL448) .....	(3)
WMST 458—Special Topics in Literature by Women after 1800 (X-listed as ENGL458) .....	(3)
WMST 466—Feminist Perspective on Women in Art (X-listed as ARTH466) .....	(3)
WMST 468—Feminist Cultural Studies .....	(3)
WMST 481—Femmes Fatales and the Representation of Violence in Literature(X-listed as FREN481) .....	(3)
WMST 496—African -American Women Filmmakers* (X-listed as THET 496) .....	(3)
FREN 482—Gender and Ethnicity in Modern French Literature .....	(3)

#### Area II: Historical Perspectives (3 credit hours)

WMST 210—Women in America to 1880(X-listed as HIST 210) .....	(3)
WMST 211—Women in America Since 1880 (X-listed as HIST 211) .....	(3)
WMST 212—Women in Western Europe, 1750-present (X-listed as HIST212) .....	(3)
WMST 320—Women in Classical Antiquity (X-listed as CLAS 320) .....	(3)
WMST 453—Victorian Women in England, France, and the United States (X-listed as HIST 493) .....	(3)
WMST 454—Women in Africa* (X-listed as HIST 494) .....	(3)
WMST 455—Women in Medieval Culture and Society (X-listed as HIST495) .....	(3)
WMST 456—Women in the Middle East* .....	(3)
WMST 457—Changing Perceptions of Gender in the US: 1880-1935 (X-listed as HIST 433) .....	(3)
AASP 498W—Black Women in United States History* .....	(3)
AMST 418J—Women and Family in American Life .....	(3)
HIST 309—Proseminar in Historical Writing: Women's History .....	(3)

#### Area III: Social and Natural Sciences (3 credit hours)

WMST 200—Introduction to Women's Studies: Women and Society .....	(3)
WMST 313—Women and Science (X-listed as BSCI 313) .....	(3)
WMST 324—Communication and Gender (X-listed as COMM 324) .....	(3)
WMST 325—Sociology of Gender (X-listed as SOCY 325) .....	(3)
WMST 326—Biology of Reproduction (X-listed as BSCI 342) .....	(3)
WMST 336—Psychology of Women (X-listed as PSYC 366) .....	(3)
WMST 360—Caribbean Women* .....	(3)
WMST 410—Women in the African Diaspora* .....	(3)
WMST 420—Asian-American Women* .....	(3)
WMST 425—Gender Roles and Social Institutions .....	(3)
WMST 430—Gender Issues in Families (X-listed as FMST 430) .....	(3)
WMST 436—Legal Status of Women (X-listed as GVPT 436) .....	(3)

WMST 452—Women and the Media (X-listed as JOUR 452) .....	(3)
WMST 471—Women's Health (X-listed as HLTH 471) .....	(3)
WMST 493—Jewish Women in International Perspective* .....	(3)
WMST 494—Lesbian Communities and Difference* .....	(3)
AASP 498F—Special Topics in Black Culture: Women and Work* .....	(3)
CCJS 498—Special Topics in Criminology and Criminal Justice: Women and Crime .....	(3)
SOCY 498W:—Special Topics in Sociology: Women in the Military .....	(3)
*Fulfills Women's Studies Multi-Cultural Requirement	

### 3. Courses in Cultural Diversity (6 credit hours)

Students will select one course for a minimum of 3 credit hours. Approved courses are noted with an asterisk in section 2, above. Courses in this category may overlap with other requirements.

### 4. Remaining Courses

The remaining courses may be chosen from any of the three distributive areas or from among any of the WMST courses including WMST 298 or 498:Special Topics and WMST 499:Independent Study.

## Advising

To obtain more information, contact the Undergraduate Advisor, (301) 405-6827, or write to the Women's Studies Department, 2101 Woods Hall, University of Maryland, College Park, MD 20742

Course Code: WMST

## CITATIONS

### College of Arts and Humanities:

American Literature  
Ancient Greek Language and Literature  
Archaeology  
British and American Literature  
British, Postcolonial, and International Anglophone Literature  
Business Chinese  
Business French  
Business German  
Business Italian  
Business Japanese  
Business Russian  
Business Spanish  
Business Management for Foreign Language Majors  
Chinese Language  
Chinese Studies  
Classical Languages and Mythology  
Classical Mythology  
Comparative Religious Studies  
Comparative Studies  
Cognitive Science  
French Language and Cultures  
German Studies  
Interdisciplinary Multi-Media and Technology  
Italian Language and Culture  
Japanese  
Jewish Studies  
Korean Studies  
Latin Language and Literature  
Linguistics  
Literature by Women  
Literature of the African Diaspora  
Music Studies  
Philosophy  
Philosophy of Science  
Portuguese Language and Cultures  
Renaissance Studies  
Rhetoric (offered jointly with COMM)  
Russian Language  
Russian Language and Literature  
Spanish Language and Cultures  
Value Theory

## 162 Citations

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### **College of Behavioral and Social Sciences:**

- Geographic Information Science
- College of Business :
- Entrepreneurship
- General Business

### **College of Computer, Math and Physical Science:**

- Actuarial Mathematics
- Applies Mathematical Modeling
- Astronomy
- Atmospheric Chemistry
- Discrete Mathematics
- Earth History
- Earth Material Properties
- Hydrology
- Meteorology
- Physics
- Statistics
- Surficial Geology
- Weather and Climate

### **College of Education:**

- Secondary Education

### **College of Engineering:**

- International Engineering
- Project Management