

CHAPTER 7

Departments, Majors and 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.aero.umd.edu

Professor and Chair: Fournay

Professors: Celi, Chopra, Flatau, Hubbard, Lee, Leishman, Lewis, Pines, Wereley

Associate Professors: Akin, Baeder, Sanner, Winkelmann, Yu

Assistant Professors: Atkins, Cadou, Humbert, Shapiro

Visiting Professors: Bowden, Korkegi, Nagaraj

Adjunct Professor: Tolson

Lecturers: Carignan, Filippone, Healy, Keller, Leach, Lilas, Lumelsky, Newsome, Smith, Van Wie

Emeriti: 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.

Department Educational Objectives

1. Prepare future aerospace engineers who will be successful in their careers, including industry, government service, and academia, in the State of Maryland and beyond.
2. Prepare students to solve relevant problems in 1) aerodynamics, 2) structures, 3) dynamics and controls, 4) propulsion, and 5) systems and design, with a focus in either the aeronautical or space areas.
3. Enable students to relate their fundamental physics, math and engineering studies to the many practical aspects of aerospace engineering research, development, and practice.
4. Prepare future aerospace engineers who are able to integrate their knowledge of engineering sub-disciplines to produce useful product designs.
5. Promote innovative educational activities to challenge students and improve the learning experience, including design presentations, hands-on laboratory experiences, novel use of Internet information technology, and independent research projects.

6. Seek continually to improve course offerings and curricula, while attracting the best students possible and improving the national stature of the program.

7. Prepare future aerospace engineers who understand the context in which their profession is practiced, and who are able to adapt to future developments in both technology and the employment market.

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 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.

82 African American Studies

Requirements for Major

	Semester	
	Credit Hours	
FRESHMAN YEAR	I	II
ENES 100 Introduction to Engineering Design	3	
ENAE 100 The Aerospace Engineering Profession	1	
CHEM 135 General Chemistry	3	
MATH 140, 141 Calculus I, II	4	4
PHYS 161 General Physics I		3
ENES 102 Statics		3
ENAE 202 Aerospace Computing		3
CORE Program Requirements	3	3
Total Credits	14	16

	Semester	
	Credit Hours	
SOPHOMORE YEAR	I	II
ENES 220 Mechanics of Materials	3	
ENAE 283 Introduction to Aeronautical Systems	3	
MATH 241 Calculus III	4	
ENAE 200 The Aerospace Engineering Profession II		1
ENME 232 Thermodynamics		3
MATH 246 Differential Equations		3
MATH 461 (or 240) Linear Algebra		3
PHYS 260/261 General Physics II	4	
PHYS 270/271 General Physics III		4
CORE Program Requirements	3	3
Total Credits	17	16

	Semester	
	Credit Hours	
JUNIOR YEAR	I	II
ENAE 311 Aerodynamics I	3	
ENAE 301 Dynamics of Aerospace Systems	3	
ENAE 362 Aerospace Instrumentation and Experiments	3	
ENAE 324 Aerospace Structures		4
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

	Semester	
	Credit Hours	
SENIOR YEAR	I	II
ENAE 464 Aerospace Engineering Lab	3	
ENAE 423 Vibration & Aeroelasticity		3
CORE Program Requirements	3	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	3	
ENAE 484 Space Systems Design		3
Total Credits	15	15

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

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 or space application areas can take courses required in the other track as electives.

Aerospace Electives

The required Aerospace Elective is either ENAE 398 or a 400 level ENAE course in addition to the student's chosen track sequence. The Technical Elective must be a 300 or 400 level course in Engineering, Mathematics, or Physical Sciences that has been approved for this purpose by the Undergraduate Program Director. Only one of ENAE 398, a 488 project course or 499 may be used for these electives.

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

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 Structural Dynamics	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)	

Honors Program

Academically talented students will be invited to participate in the Aerospace Honors program. Honors sections of ENAE 283, ENAE 311, and 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 numerous academic scholarships. All admitted and current students in the department are automatically considered for these awards and winners are chosen based on merit. No separate application is required.

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, American Helicopter Society - International, and the Sigma Gamma Tau honor society. Aerospace Engineering students are also frequent participants in student activities of the Society for Advancement of Materials and Process Engineering.

AFRICAN AMERICAN STUDIES (AASP)

College of Behavioral and Social Sciences

2169 Lefrak Hall, 301-405-1158
www.bsos.umd.edu/aasp/

Chair and Associate Professor: S. Harley
Professor: E. Wilson* (GVPT)
Associate Professor: F. Wilson
Assistant Professors: M. Chateauvert, J. Nembhard
*Joint appointment with unit indicated.

The African American Studies Department 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).

Cultural and Social Analysis 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.

	Semester Credit Hours
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
Upper-Division Electives in African American Studies	18

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.

	Semester Credit Hours
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 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	9
---	----------

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 advisor.

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.

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

- (1) 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

- (2) 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 Department 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:

1. 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.

2. Students may designate African American Studies as a double major, completing the major requirements for both AASP and another program.
3. AASP can be a supporting area of student for majors such as Computer Science, Business, or Engineering.
4. Students may obtain a minor in Black Women's Studies by completing 15 credit hours of coursework.

Scholarships and Financial Aid:

John B. and Ida Slaughter Scholarship

Advising

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

Course Code: AASP

84 Agricultural Sciences, General

AGRICULTURAL SCIENCES, GENERAL (GNAS)

College of Agriculture and Natural Resources

0115 H.J. Patterson, 301-405-1331

Program Coordinator: D.S. Glenn (sglenn@umd.edu)

Department Offices - 2102 Plant Sciences Building, 301-405-4355

www.nrsl.umd.edu/

Professor and Chair: Coale

Professors: Dernoeden, Fretz, Hill, James*, Kenworthy, McIntosh*, Miller, Ng, Quebedeaux, Rabenhorst, Solomos, Walsh, Weil, Weismiller

Associate Professors: Bouwkamp, Carroll, Coleman, Costa, Deitzer, Everts, Glenn, Grybauskas, Lea-Cox, Ritter, Slaughter, J.B. Sullivan, J.H. Sullivan, Swartz, Turner, Vough

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

Lecturers: Bosmans, Nola, Steinhilber

Professor of the Practice: Cohan

Affiliate Professors: Fiola, Kearney, Tjaden

Adjunct Professors: Cregan, Daughtry, Meisinger, Mucciardi, Rosenberg, Saunders, Tamboli

Adjunct Associate Professors: Christiansen, Izaurralde, Tucker

Adjunct Assistant Professors: Kane, Leonard, Pooler

Professors Emeriti: Aycock, Bandel, Beste, Clark, Decker, Fanning, Gouin, Hoyert, Kuhn, Link, McClurg, Mulchi, Oliver, Shanks, Strickling, 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 Agricultural 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.

This program is currently under revision. Incoming students should contact their advisor for any recent changes.

Curriculum in General Agricultural Sciences (GNAS)

Requirements for Degree	Semester Credit Hours
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 131/132 General Chemistry I	4
CHEM 104 Fundamentals of Organic and Biochemistry, or CHEM 113 General Chemistry II	
and CHEM 231/232 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
PLSC 420 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

Professor and Chair: McConnell

Professors: Bockstael, Chambers, Gardner††, Hueth, Just†† Lichtenberg, Lopez, Musser, Nerlove, Olson

Associate Professors: Alberini, Haigh, Hanson, Horowitz, Leathers, Lipton, Lynch, Parker

Assistant Professors: Kirwan, Lange, Leonard, McAusland, Melkonyan

Emeriti: Bender, Brown, Cain, Foster, Hardie, Moore, Stevens, Strand,

Tuthill, Wysong

Adjunct: Chavas

††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 are strongly encouraged to 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. Students are also able to minor in Agricultural and Resource Economics.

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 advisor 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

Prerequisite Courses	Semester Credit Hours
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 404 Applied Price Analysis	3
AREC 405 Economics of Production	3
AREC 425 Economics of Food Sector	3
AREC 427 Economics of Commodity 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

AREC 306, AREC 382, or any other 3 credit 400 level AREC course may be substituted with permission of advisor.

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	3
BMGT 364 Management and Organization	3
BMGT 380 Business Law I	3

Other 300 level BMGT courses may be substituted, with permission of advisor. The AREC department cannot authorize students to take BMGT courses that are restricted to business majors.

• Agricultural Science

Six (or more) courses (for a total of at least 18 credits) in agricultural science, including:

ENBE 110 Introduction to Biological Resources Engineering	1
ENBE 200 Fundamentals of Agricultural Mechanics	3
PLSC 100 or 101 Introduction to Horticulture or Crop Science	4
NRSC 105 Soil and Environmental Quality	3
ANSC 101 Principles of Animal Science	3

Other courses in agricultural science, chosen in consultation with an advisor. Substitutions to the above listed courses may be made with the permission of advisor.

• Food Production

Six courses (for a total of at least 18 credits) from the following list:

PHYS 117 (or PHYS 121) Introduction to Physics	4
BSCI 105 Principles of Biology	4
BSCI 223 Introduction to Microbiology	4
NFSC 100 Elements of Nutrition	3
NFSC 112 Food Science and Technology	3
NFSC 430 Food Microbiology	2
NFSC 431 Food Quality Control	4

Other courses related to food science can be substituted with permission of advisor.

• Environmental and Resource Policy

Six courses (for a total of at least 18 credits) from the following list:

ECON 381 Environmental Economics	3
ANTH 450 Resource Management and Cultural Process	3
HIST 405 Environmental History	3
GEOG 372 Remote Sensing	3
GEOG 373 Geographic Information Systems	3
GVPT 273 Introduction to Environmental Politics	3
GVPT 306 Global Ecopolitics	3

Other courses related to environmental policies or sciences can be substituted with permission of advisor.

• International Agriculture

Six courses (for a total of at least 18 credits) from the following list:

ECON 305 Intermediate Macroeconomics	3
ECON 315 Economic Development of Underdeveloped Areas	3
ECON 340 International Economics	3
GEOG 422 Population Geography	3
GVPT 200 International Political Relations	3
GVPT 350 International Relations in the Third World	3
NRSC 440 Crops, Soils and Civilization	3
PLSC 303 International Crop Production	3

Other courses related to international economics, business, politics, or agriculture can be substituted with permission of advisor.

• Political Process

Any six courses (for a total of at least 18 credits) in government and politics (GVPT), chosen with permission of the advisor.

• Advanced Degree Preparation

Six (or more) courses (for a total of at least 18 credits) from the following list:

ECON 407 Advanced Macroeconomics	3
ECON 414 Game Theory	3
ECON 415 Strategic Behavior and Incentives	3
ECON 422 Quantitative Methods in Economics I	3
ECON 423 Quantitative Methods in Economics II	3
ECON 425 Mathematical Economics	3
MATH 141 Calculus II	4
MATH 240 Introduction to Linear Algebra	4
MATH 241 Calculus III	4

Other courses in mathematics, statistics, or econometrics may be substituted with permission of advisor.

• Student Designed Field

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

Requirements for Minor in AREC. Three minors exist in AREC.

• Agribusiness Economics

AREC 250 Elements of Agricultural and Resource Economics	3
AREC 404 Applied Price Analysis	3
AREC 405 Economics of Production	3
AREC 425 Economics of Commodity Marketing Systems	3
AREC 435 Commodity Futures and Options	3

Another AREC course can be substituted for one of the course listed with permission of the Undergraduate Advisor.

• Resource and Agricultural Policy in Economic Development

AREC 250 Elements of Agricultural and Resource Economics	3
AREC 365 World Hunger, Population and Food Supplies	3
AREC 433 Food and Agricultural Policy	3
AREC 445 Agricultural Development, Population Growth, and the Environment	3
AREC 453 Natural Resources and Public Policy	3

Another AREC course can be substituted for one of the course listed with permission of the Undergraduate Advisor.

• Environmental Economics and Policy

AREC 240 Introduction to Economics and the Environment	3
AREC 332 Introduction to Natural Resource Policy	3
AREC 382 Computer-based Analysis in Agricultural and Resource Economics	3
AREC 445 Agricultural Development, Population Growth, and the Environment	3
AREC 455 Economics of Land Use	3

Another AREC course can be substituted for one of the course listed with permission of Undergraduate Advisor.

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

Professor and Chair: Caughey

Professors: Kelly, Michel, Struna

Associate Professors: Lounsbury, Mintz, Paoletti, Parks, Sies

86 Animal Sciences

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 advisors, 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

Changes in requirements are under review. Students should consult the department for updated information. 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.

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 advisor; this plan will be kept in the student's file. All cores must be approved in writing by an advisor.

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.

Advising

Departmental advising is mandatory every semester for all majors.

Course Code: AMST

ANIMAL SCIENCES (ANSC)

College of Agriculture and Natural Resources

1415A Animal Sciences Center, 301-405-1373

E-mail: markv@umd.edu

www.ansc.umd.edu

Department of Animal and Avian Sciences

Professor and Chair: Erdman

Professors: Harrell, Mather, Ottinger, Peters, Porter, Varner, Vijay

Associate Professors: Angel, Doerr, Estevez, Hartsock, Keefer, Kohn, Stricklin, Woods, Zimmermann

Assistant Professors: Bequette, Burk, Hamza, Humphrey, Seiwerdt, Song

Emeriti: Douglass, Heath, Soares, Vandersall, Westhoff, Williams, Young
Adjunct Professors: Bakst, Howard, McMurtry, Paape, Rattner, Richards, Wall

The Major

Animal Sciences prepares students for veterinary school, graduate school and careers in research, sales and marketing, biotechnology, 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 Biotechnology, Animal Care and Management, Equine Studies, Laboratory Animal Management, and Sciences/ Professional Option to prepare for admission to graduate, veterinary, pharmacy, nursing or medical school. The Animal Sciences Center includes classrooms, lecture hall, social area, teaching labs, and animal rooms adjacent to a teaching farm where horses, sheep, and cattle are maintained throughout the year.

ANIMAL SCIENCES CORE: All undergraduates majoring in Animal Sciences must complete the following course requirements:

ANSC 101 Principles of Animal Sciences
ANSC 211 Animal Anatomy
ANSC 212 Animal Physiology
ANSC 214 Animal Physiology Laboratory
ANSC 314 Comparative Animal Nutrition
ANSC 327 Molecular and Quantitative Animal Genetics
BSCI 105 Principles of Biology I
BSCI 223 General Microbiology
CHEM 131/132 General Chemistry I/Laboratory
MATH 220 **or** 140 Calculus **or** above
AREC 250 Elements of Agricultural and Resource Economics **or**
ECON 200 Principles of Micro-Economics

ADDITIONAL COURSE WORK: All students must complete 30-40 credits in one of the following six options.

1. ANIMAL CARE AND MANAGEMENT (0104A)

Required Courses

ANSC 315 Applied Animal Nutrition
ANSC 446 Physiology of Mammalian Reproduction
ANSC 447 Physiology of Mammalian Reproduction Laboratory
AREC 306 Farm Management
BSCI 106 Principles of Biology II
CHEM 104 Fundamentals of Organic and Biochemistry

Plus take 6 credits from the following courses:

ANSC 420 Critical Thinking in Animal Sciences
ANSC 435 Experimental Embryology
ANSC 437 Animal Biotechnology
ANSC 443 Physiology and Biochemistry of Lactation
ANSC 444 Domestic Animal Endocrinology
ANSC 452 Avian Physiology
ANSC 453 Animal Welfare
ANSC 455 Applied Animal Behavior
ANSC 497 Animal Biotechnology Recombinant DNA Laboratory

Plus take 9 credits from the following courses:

ANSC 340 Health Management of Animal Populations
ANSC 220 Livestock Management
ANSC 232 Horse Management
ANSC 240 Dairy Cattle Management
ANSC 255 Introduction to Aquaculture
ANSC 262 Commercial Poultry Management
ANSC 305 Companion Animal Care
ANSC 413 Laboratory Animal Management

2. EQUINE STUDIES (0104C)

Required Courses

ANSC 220 Livestock Management
ANSC 232 Horse Management
ANSC 330 Equine Science
ANSC 315 Applied Animal Nutrition
ANSC 446 Physiology of Mammalian Reproduction
ANSC 447 Physiology of Mammalian Reproduction Laboratory
AREC 306 Farm Management
BSCI 106 Principles of Biology II
CHEM 104 Fundamentals of Organic and Biochemistry

Plus take 9 credits from the following courses:

ANSC 340 Health Management of Animal Populations
ANSC 420 Critical Thinking in Animal Sciences
ANSC 435 Experimental Embryology
ANSC 437 Animal Biotechnology
ANSC 443 Physiology and Biochemistry of Lactation
ANSC 444 Domestic Animal Endocrinology
ANSC 452 Avian Physiology
ANSC 453 Animal Welfare
ANSC 455 Applied Animal Behavior
ANSC 497 Animal Biotechnology Recombinant DNA Laboratory

3. LABORATORY ANIMAL MANAGEMENT (0104D)

Required Courses

ANSC 340 Health Management of Animal Populations
ANSC 413 Lab Animal Management
ANSC 437 Animal Biotechnology
ANSC 446 Physiology of Mammalian Reproduction
ANSC 447 Physiology of Mammalian Reproduction Laboratory
ANSC 453 Animal Welfare
ANSC 455 Applied Animal Behavior
BSCI 106 Principles of Biology II
CHEM 104 Fundamentals of Organic and Biochemistry

Plus take 6 credits from the following courses:

ANSC 420 Critical Thinking in Animal Sciences
ANSC 435 Experimental Embryology
ANSC 443 Physiology and Biochemistry of Lactation
ANSC 444 Domestic Animal Endocrinology
ANSC 452 Avian Physiology
ANSC 497 Animal Biotechnology Recombinant DNA Laboratory

Plus take 3 credits from the following courses:

ANSC 220 Livestock Management
ANSC 255 Introduction to Aquaculture
ANSC 262 Commercial Poultry Management

4. & 5. SCIENCES & COMBINED AG AND VET SCI (0104E and 1299D)

Required Courses

ANSC 315 Applied Animal Nutrition
BSCI 106 Principles of Biology II
BCHM 463 Biochemistry of Physiology **or**
BSCI 230 Cell Biology and Physiology
CHEM 231/232 Organic Chemistry I/Laboratory
CHEM 241/242 Organic Chemistry II/Laboratory
CHEM 271 General Chemistry and Energetics
PHYS 121 Fundamentals of Physics I
PHYS 122 Fundamentals of Physics II

Plus take 9 credits from the following courses:

ANSC 340 Health Management of Animal Populations
ANSC 420 Critical Thinking in Animal Sciences
ANSC 435 Experimental Embryology
ANSC 437 Animal Biotechnology
ANSC 443 Physiology and Biochemistry of Lactation
ANSC 444 Domestic Animal Endocrinology
ANSC 446 Physiology of Mammalian Reproduction
ANSC 447 Physiology of Mammalian Reproduction Laboratory
ANSC 452 Avian Physiology
ANSC 453 Animal Welfare
ANSC 455 Applied Animal Behavior
ANSC 497 Animal Biotechnology Recombinant DNA Laboratory

Plus take 3 credits from the following courses:

ANSC 220 Livestock Management
ANSC 232 Horse Management
ANSC 240 Dairy Cattle Management
ANSC 255 Introduction to Aquaculture
ANSC 262 Commercial Poultry Management
ANSC 413 Laboratory Animal Management

For additional information concerning veterinary school applications, please contact the K. Feldman, VMRCVM, 8705 Greenmead Dr., University of Maryland, College Park, MD 20742-3711, 301-314-6820, kfeldman@umd.edu.

6. ANIMAL BIOTECHNOLOGY (0104F)

Required Courses

ANSC 437 Animal Biotechnology
ANSC 497 Animal Biotechnology Recombinant DNA Laboratory
BCHM 463 Biochemistry of Physiology
BSCI 230 Cell Biology and Physiology
CHEM 231/232 Organic Chemistry I/Laboratory
CHEM 241/242 Organic Chemistry II/Laboratory
CHEM 271 General Chemistry and Energetics

Plus take 3 credits from the following courses:

ANSC 220 Livestock Management
ANSC 255 Introduction to Aquaculture
ANSC 262 Commercial Poultry Management
ANSC 413 Laboratory Animal Management

Plus take 9 credits from the following courses:

ANSC 340 Health Management of Animal Populations
ANSC 420 Critical Thinking in Animal Sciences
ANSC 443 Physiology and Biochemistry of Lactation
ANSC 446 Physiology of Mammalian Reproduction
ANSC 447 Physiology of Mammalian Reproduction Laboratory
ANSC 452 Avian Physiology
ANSC 453 Animal Welfare
ANSC 455 Applied Animal Behavior

Plus take 3 credits from the following courses:

ANSC 435 Experimental Embryology
BSCI 380 Comparative Bioinformatics
BSCI 413 Recombinant DNA

Advising

Advising is mandatory. Each student will be assigned to a faculty advisor 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 Kinghome 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, Sigma Alpha sorority, the University of Maryland Equestrian Club, the Veterinary Science Club, and the Poultry Science Club. For more information, visit the ANSC Office of Undergraduate Studies, 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

Professor and Chair: Chambers
Professors: Agar (Emeritus), Chernela (also LASC), Gonzalez (Emerita), Jackson, Leone, Shackel, Whitehead, Williams
Associate Professors: Freidenberg, Paolisso
Assistant Professors: Brighton, Stuart
Lecturers: Finch, Hall, London, Wilczak
Faculty Research Associate: Mortensen
Affiliate Faculty: Bolles (WMST), Caughey (AMST), Harrison (CMLT, LASC), Kim (WMST), Linebaugh (HISP), Nieves (HISP), Robertson (MUSC)
Adjunct Faculty: Abbott-Jamieson (Adjunct Professor, National Oceanic and Atmospheric Administration, Crain (Adjunct Professor, LTG Associates), Fiske, Froment (Adjunct Professor), Kaljee (Adjunct Professor), Little (Adjunct Professor, National Park Service), McManamon (Adjunct Professor, National Park Service), Miere (Adjunct Professor, Sr. Fellow, Smithsonian Institute), Potter (Adjunct Professor, National Park Service), Puentes-Markides (Adjunct Professor, PAHO/WHO), Tashima (Adjunct Professor, LTG Associates)
Advisor Consultant: Robinson

88 Applied Mathematics and Scientific Computation Program

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.

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.

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 Office of 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 advisor'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 Office of Undergraduate Studies who serves as the administrative advisor for all undergraduate majors and minors. All majors are required to meet with the director of Office 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 advisor 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 advisors (and should be contacted individually). Each major is expected to select an academic advisor 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 advisor. For additional information, students should contact the Director of Office of Undergraduate Studies, Dr. Paul Shackel, 1119 Woods Hall, 301-405-1422; E-mail: pshackel@anth.umd.edu. or Advisor Consultant, Keisha Robinson, 1117 Woods Hall, 301-405-1436; E-mail: krobinson@anth.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 advisor.

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

APPLIED MATHEMATICS AND SCIENTIFIC COMPUTATION PROGRAM

College of Computer, Mathematical and Physical Sciences

3103 Mathematics Building, 301-405-0924

www.amsc.umd.edu

Director: Levermore

Faculty: More than 100 members from 19 units.

The Applied Mathematics and Scientific Computation Program offers a graduate program in which students combine studies in mathematics and application areas. The Program also offers an undergraduate Certificate in Computational Science. AMSC courses carry credit in mathematics, with the exception of AMSC 462. 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.

Certificate in Computational Science

The Certificate in Computational Science introduces students to basic computational methods for better understanding and solving problems in the physical sciences. Numerical techniques and computer architecture will be taught with the goal of applying these to situations in the physical sciences. Computational methods will be applied to problems that are not analytically tractable; for comparison, physical problems that are amenable to analysis will also be examined. The goal of the program is to enhance student understanding of numerical methods that will be of use in graduate school, academic research, and industry.

Certificate Requirements

1. Core Requirements

The following courses are required:

Three courses in Programming Languages, Numerical Methods, and Computer Architecture

CMSC106 **or** CMSC131 – Introduction to Programming
AMSC460 Computational Methods
AMSC462 Intro to Comp Organization and Tools for Scientific Computing

A course in which advanced computation is applied to scientific problems

PHYS474 Computational Physics **or**
ASTR415 Computational Astrophysics

A science base

PHYS273 Introductory Physics: Waves **or**
PHYS270 General Physics: Electrodynamics, Light, Relativity and Modern Physics **and**
PHYS271 General Physics: Electrodynamics, Light, Relativity and Modern Physics Lab

Note: Any of CMSC106 **or** CMSC131, CMSC114 **or** CMSC132, CMSC214 **or** CMSC212, ENEE114, PHYS165, may be substituted for CMSC106 **or** CMSC131. AMSC466 may be substituted for AMSC460. CMSC311 and CMSC351 may be substituted for AMSC462.

2. Electives

Elective courses must be chosen from the list below such that the entire sequence of courses for the Certificate meets the following two conditions: (a) at least 12 credit hours must be at the 300-400 level; (b) at least 12 credit hours must be outside the major. In the case of multiple majors, at least 12 credit hours must be outside all the other major requirements.

ASTR120 Introductory Astrophysics-Solar System (3)
ASTR121 Introductory Astrophysics II-Stars and Beyond (4)
ASTR320 Theoretical Astrophysics (3)
ASTR415 Computational Astrophysics
CMSC114 **or** CMSC132 Computer Science I (4)
CMSC214 **or** CMSC212 Computer Science II (4)
CMSC250 Discrete Structures (4)
GEOL341 Structural Geology (4)
MATH240 Introduction to Linear Algebra (4)
MATH241 Calculus III (4)
MATH246 Differential Equations for Scientists and Engineers (3)
MATH431 Geometry for Computer Graphics (3)
MATH452 Introduction to Dynamics and Chaos (3)
MATH462 Partial Differential Equations for Scientists and Engineers (3)
MATH464 Transform Methods to Scientists and Engineers (3)
PHYS171 Introductory Physics: Mechanics and Relativity (3)
PHYS272 Introductory Physics: Fields (3)
PHYS273 Introductory Physics: Waves (3)
PHYS374 Intermediate Theoretical Methods (4)
{PHYS401 Quantum Physics I (4)
or PHYS420 Principles of Modern Physics (3)}
PHYS402 Quantum Physics II (4)
PHYS404 Introduction to Statistical Thermodynamics (3)
PHYS410 Classical Mechanics (4)
PHYS411 Intermediate Electricity and Magnetism (4)
PHYS474 Computational Physics

Research

An honors program will provide opportunities for outstanding students to engage in research on a computational project with a faculty member. Students will be accepted into this program after their sophomore year based on their academic performance.

To obtain more information, contact the Applied Math and Scientific Computing Program, 3103 Mathematics Building, UMCP, Telephone: 301-405-0924, www.amsc.umd.edu/

Course Code: AMSC

ARCHITECTURE

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

ART (ARTT)

College of Arts and Humanities

1211-E Art/Sociology Building
Undergraduate Program 301-405-1445
Graduate Program 301-405-7790
www.art.umd.edu

Chair: Ruppert
Undergraduate Director: Sham
Graduate Director: Craig
Professor Emerita: DeMonte†
Professor Emeritus: Driskell††
Professors: Fabiano, Lapinski, Ruppert, Sham
Associate Professors: Craig, Humphrey, Kehoe, Klank, Lozner, McCarty, Richardson, Thorpe
Assistant Professor: Gavin, Morse, Pinder
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

90 Art History and Archaeology

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 Advisor 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 advisor.

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.arthistory_archaeology.umd.edu/

Chair: Promex

Professors: Hargrove, Kelly, Kuo, Mansbach, Pressly, Promey, Venit, Wheelock

Associate Professors: Colantuono, Gill, Spiro

Assistant Professors: Ater, Shannon

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, 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 and Asian 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.

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 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.

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 advisor 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

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

For information on these programs, consult the School of Languages, Literatures, and Cultures elsewhere in this chapter.

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

www.astro.umd.edu

Chair: Mundy

Associate Director: Trasco

Professors: A'Hearn, Harrington, Papadopoulos, Rose, Vogel, Wilson

Professors Emeritus: Bell, Earl, Erickson, Kundu, Leventhal, Veilleux, Wentzel

Associate Professors: Hamilton, Harris, McGaugh, Miller, Ostriker, Reynolds

Assistant Professors: Richardson, Ricotti

Instructor: Deming

Lecturer: Hayes-Gehrise

Adjunct Professors: Gehrels, Holt, Mushotzky, White

Senior Research Scientists: Kundu, Lisse, Sharma

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

Assistant Research Scientists: Bandler, Hewagama, Lanz, Loewenstein, Markwardt, Ng, Nixon, 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 can be substituted for this sequence. PHYS 374, 401, and 404 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 is a partner in the Combined Array for Research in Millimeter-Wave Astronomy (CARMA), which operates a millimeter wavelength radio array located near Bishop, California. The array is the largest and most sensitive array in the world. The Department is a partner with Kitt Peak National Observatory in the building of a large format near infrared camera for the Mayall 4-meter optical telescope. Opportunities are available for undergraduates to become involved in research with both facilities. 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 Astronomy courses offered for those who are interested in learning about the subject but do not wish to major in it. These courses are designed especially for the non-science major. ASTR 100 and 101 are general survey courses in Astronomy. They cover (briefly) all the major topics in the field. ASTR 220 is an introductory course dealing with the topic, "Collisions in Space." Several 300-level courses are offered primarily for non-science students who want to learn about a particular field in depth, such as the Solar System, Stellar Evolution, the Origin of the Universe or Life in the Universe.

Minor

A Minor in Astronomy may be earned by completing (with grades of C or better) an introductory course-like ASTR 100 or ASTR 101, ASTR 220 and three of the following: ASTR 300, 330, 340, 380 or 498. Contact Department for rules and procedures.

Honors

The Honors Program offers students of exceptional ability and interest in Astronomy opportunities for part-time research participation which may develop into full-time summer projects. Honors students work with a faculty advisor on a research project for which academic credit may be earned. Certain graduate courses are open for credit toward the bachelor's degree. (Students are accepted into the Honors Program by the Department's Honors Committee on the basis of grade point average or recommendation of faculty.) Honors candidates submit a written proposal on their research project and enroll in ASTR 399, complete a research project, write a thesis and do an oral presentation before a committee. Satisfactory grades lead to graduation "With Honors (or High Honors) in Astronomy."

For Additional Information

Further information about advising and the Honors Program can be obtained by calling the Department of Astronomy office at 301-405-3001. Students who have been away more than two years may find that due to curriculum changes the courses they have taken may no longer be adequate preparation for the courses required to complete the major. Students in this situation must meet with the Departmental Advisor to make appropriate plans.

Course Code: ASTR

ATMOSPHERIC AND OCEANIC SCIENCE

College of Computer, Mathematical, and Physical Sciences

3417 Computer and Space Sciences Building, New Wing 301-405-5391
www.atmos.umd.edu

Professor and Chair: Dickerson
Professors: Baer (Emeritus), Busalacchi, Carton, Ellingson (Emeritus), Hudson, Kalnay, Li, Nigam, Pinker, Thompson, Vernekar (Emeritus), Zhang
Associate Professor: Murtugudde, Zeng
Assistant Professor: Kirk-Davidoff
Research Professor: Rasmusson
Research Associate Professor: Berbery, Doddridge
Adjunct Professor, Michael King, Anne Thompson, Robert Atlas, William K. Lau

The Department of Atmospheric and Oceanic Science offers several courses to undergraduate students. Undergraduates can take courses individually or as part of a Minor in Meteorology which can prepare them for careers in Atmospheric and Oceanic Science and Earth Sciences or for graduate studies in these areas. Three Minor tracks are available:

Minor in Meteorology
Minor in Atmospheric Sciences
Minor in Atmospheric Chemistry

The Minor in Meteorology is the most suitable preparation for graduate students in Atmospheric and Oceanic Science. For more details visit: atmos.umd.edu/MINOR or contact the Undergraduate Advisor, R. Hudson: (hudson@atmos.umd.edu).

The following undergraduate courses are offered:

AOSC 123 Global Change—Implications of Global Climate Change
AOSC 200 Weather & Climate—Atmospheric sciences and forecasting
AOSC 201 Weather & Climate Lab—Laboratory for AOSC 200
AOSC 375 Introduction to the Blue Ocean—Physical, Chemical and Biological Properties of the Ocean
AOSC 400 The Atmosphere—Weather and Climate Systems
AOSC 401 Global Environment—The Atmosphere-Ocean-Biosphere
AOSC 431 Atmospheric and Oceanic Science for Scientists and Engineers I
AOSC 432 Atmospheric and Oceanic Science for Scientists and Engineers II
AOSC 434 Air Pollution—Generation, transport and removal of air pollutants
AOSC 499 Special Problems in Atmospheric Sciences—Research in Atmospheric Sciences

Undergraduates can also pursue a bachelor's degree in Physical Sciences or Physics, which has a specialty in Atmospheric and Oceanic Science. The advisor for the Physical Sciences program, Tom Gleason, can be contacted at tgleason@physics.umd.edu. Students who anticipate careers in Atmospheric and Oceanic Science should consult the undergraduate advisor of the Department of Atmospheric and Oceanic Science as early as possible in their studies.

BIOLOGICAL RESOURCES ENGINEERING (ENBE)

College of Agriculture and Natural Resources and A. James Clark School of Engineering

1457 An. Sci./Biological Resources Engr. Building, 301-405-1198
E-mail: tscites@umd.edu
www.bre.umd.edu

Acting Chair: Baldwin
Professors: Johnson, Ross, Shirmohammadi, Tao, Wheaton
Associate Professors: Baldwin, Felton, Kangas, Montas
Assistant Professors: Becker, Tilley

92 Biological Resources Engineering

Emeriti: Brodie, Grant, Harris, Krewatch, Merrick, Stewart
Adjunct Professors: Chen, Rawls
Adjunct Associate Professor: Adams

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
Total	15

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
Total	14

Sophomore Year

CHEM 231 Organic Chemistry	3
CHEM 232 Organic Chemistry Lab	1
BSCI 223 General Microbiology	4
ENES 220 Mechanics of Materials	3
*PHYS 260 General Physics	3
PHYS 261 General Physics Lab	1
Total	15

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
*CORE ¹	3
Total	16

Junior Year

ENBE 453 Introduction to Biological Materials	3
ENBE 455 Basic Electronic Design	3
ENME 331 Fluid Mechanics	3
or ENCE 305 Basic Fluid Mechanics	
MATH 241 Calculus III	4
*CORE ¹	3
Total	16
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
*CORE ¹	3
Total	17

Senior Year

ENBE 471 Biological Systems Control	3
ENBE 422 Water Resources Engineering	3
or ENBE 456 Biomedical Instrumentation	
ENBE 485 Capstone Design I	1
[BIOL SCI: Technical Elective] ³	3
ENGL 393 Technical Writing	3
*CORE ¹	3
Total	16
ENBE 482 Dynamics of Biological Systems	1
ENBE 484 Engineering in Biology	3
ENBE 486 Capstone Design II	2
[ENGR SCI: Technical Elective] ³	6
*CORE ¹	3
Total	15

*Satisfies General Education Requirements

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

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

³Technical 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.

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 Materials 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 Chemical and Life Sciences

1322 Symons Hall, 301-405-6892

Academic Undergraduate Programs Office

Associate Director of Academic Undergraduate Programs: Joelle Presson

www.chemlife.umd.edu

The Major

The Biological Sciences major is jointly offered by the Departments of Biology, Cell Biology & Molecular Genetics, and Entomology. 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:

Cell Biology & Genetics (CEBG)
Ecology & Evolution (ECEV)
General Biology (GENB)
Microbiology (MICB)
Physiology & Neurobiology (PHNB)
Individualized Studies (BIVS)

A complete list of specialization area requirements can be found on our website, www.chemlife.umd.edu. Note that the Individualized Studies specialization (BIVS) requires permission of the Associate Director of Undergraduate Academic Programs, and involves an approved proposal to do coursework in the College and in other disciplines. Further questions about Biological Sciences can be directed to the Undergraduate Academic Program Office at 301-405-6892.

Requirements for Major

	Semester Credit Hours
CORE Program	30
Basic Program in Biological Sciences	15-16
BSCI105 Principles of Biology I	
BSCI106 Principles of Biology II	
BSCI 207 Principles of Biology III	
BSCI222 Principles of Genetics	
Supporting courses	30-32
Math 220 or 140 Calculus I	
MATH 221 or 141 Calculus II	
*CHEM 131 & 132 Fundamentals of General Chemistry	
CHEM 231 & 232 Organic Chemistry I	
CHEM 241 & 242 Organic Chemistry II	
*CHEM 271 & 272 Gen. Chem. & Energetics, Gen. Bioanalytical Lab	
PHYS 121 or 141 Physics I	
PHYS 122 or 142 – Physics II	
*New chemistry courses replace CHEM 103 and CHEM 113	
Advanced Program in Specialization Area	27
<i>See website for details of specialization Area requirements.</i>	
Electives	15-18

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 Chemical and 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 advisor from the College of Chemical and Life Sciences advising staff. Students will be assigned to a departmental faculty advisor once a basic sequence of courses has been successfully completed. The departmental faculty advisors are coordinated by the following persons for the indicated specialization areas. These coordinating advising offices can be contacted for making appointments with an advisor or for any other information regarding that specialization area.

Straney Compton	1225 H.J. Patterson 2227 Biology-Psychology	301-405-2766 301-405-6904	CEBG, GENB, MICB ECEV, PHNB
Kent Presson	3142 Plant Sciences 1322 Symons Hall	301-405-3911 301-405-6892	GENB BIVS, Education Double major

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 Chemical and Life Sciences

2227 Biology-Psychology Building, 301-405-6904

E-mail: biolugrad@umail.umd.edu

Professor and Chair: Payne

Associate Chairs: Compton, Forseth

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

Associate Professors: Ades, Cummings, Dietz, Dudash, Fagan, Fenster, Forseth, Higgins, Poeppel, Shaw, Small, Sukharev, Tishkoff

Assistant Professors: Araneda, Bely, Castillo-Davis, Haag, Hare, Lee, Quinlan, Simon, Soares

Senior Lecturers: Compton, Infantino

Lecturers: Arnot, Jensen, Koines, Opoku-Edusei

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

Director of Graduate Studies: Forseth

Director of Office of Undergraduate Studies: Compton

94 Business, General

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), and Ecology and Evolution (ECEV). 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

BUSINESS, GENERAL

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

CELL BIOLOGY AND MOLECULAR GENETICS

College of Chemical and Life Sciences

Microbiology Building, 301-0405-5435
www.cbmg.umd.edu

Chair: Wolniak

Director of Undergraduate Studies: Straney

Professors: Bean, Cooke, Hutcheson, Mosser, Simon, Stein, Sze, Wolniak

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

Assistant Professors: Briken, Buck, DiRuggerio, Frauwrith, Fredrickson, Gao, Kwak, Mclver

Instructor: Smith

Lecturers: Shields, Moctezuma

Professors Emeriti: Collwell, Cook, Doetsch, Hetrick, Joseph, Kantzes, Patterson, Pelczar, Reveal, Roberson, Weiner, Yuan

Affiliate Assistant Professors: Perez, Hamza

Affiliate Associate Professor: Pick

Affiliate Professors: Colombini, Jeffery, Mather, Saltzberg

Adjunct Assistant Professors: Hall, Wu

Adjunct Associate Professors: Baehrecke, Culver, Freed, Green

Adjunct Professors: Moss, Nuss, Vakharia, White, Wickner

Research Assistant Professors: del Campillo, Cunningham

The Majors

The department participates in the teaching and advising of students in the Biological Sciences Program, specifically in the Specialization Areas of Cell Biology & Genetics (CEBG), Microbiology (MICB), and General Biology (GENB). Our courses are taught in four basic areas that represent faculty research interests and expertise including:

- Cell and Developmental Biology
- Genetics and Genomics
- Microbiology, Microbial Pathogenesis and Immunology
- Plant Biology

Requirements for the Specialization Areas

See Biological Sciences Program catalog entry for more information on the degree requirements.

Advising

Advising is mandatory. The Department in coordination with the Student Affairs Office of the College of Chemical and Life Sciences administers the advising of students in the Biological Sciences specialization areas of Microbiology, Cell Biology and Genetics, and General Biology. Advising assignments can be found by contacting the Cell Biology and Molecular Genetics Undergraduate Program Office, 1225 H.J. Patterson Hall (301-405-2766) or see the site: www.cbmg.umd.edu/undergrad/advising.com.

Research Experience and Internships

Students may participate in Department hosted research experiences in faculty laboratories or laboratories at off campus locations. Please contact the Cell Biology and Molecular Genetics Undergraduate Office for more information or see the site: www.cbmg.umd.edu/undergrad/research.html

Honors and Awards

The Departmental Honors Program involves a long term (three semester) independent research project undertaken with a faculty advisor. Please contact the Cell Biology and Molecular Genetics Undergraduate Office for more information or see the site: www.cbmg.umd.edu/undergrad/research.html

The P. Arne Hansen Award is awarded annually to a Departmental Honors student who has demonstrated outstanding achievement through the research experience. The Sigma Alpha Omicron Award is given to outstanding seniors who have excelled in the areas of Microbiology, or in Cell Biology and Genetics. The Appleman-Norton Award is given to the senior who has excelled in the area of Plant Biology.

Student Organizations

All students interested in microbiology are encouraged to join the University of Maryland Student Chapter of the American Society for Microbiology. Sigma Alpha Omicron is the honors chapter of this group. The groups meet regularly on campus. Information is available through the Undergraduate Program Office.

CENTRAL EUROPEAN, RUSSIAN, AND EURASIAN STUDIES (CERE)

College of Arts and Humanities

2115 Francis Scott Key Hall, 301-405-4295
www.ceres.umd.edu

Director: Michael David-Fox

Professors: Herf (History), Mansbach (Art History and Archaeology), Brecht (Asian and East European), Tismaneanu (Government and Politics), Lampe (History), Murrell (Economics), Robinson (Sociology), Ruzenblit (History)

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)

Departmental advising is mandatory for second-semester sophomores

The Major

CERE offers courses leading to a Bachelor of Arts degree. Students in the program study Russian, Eurasian, and Central/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, Jewish Studies, Sociology, Theatre, and Germanic Studies.

Requirements for the CERE major include the College of Arts and Humanities requirement of 45 upper-level credits completed. The College's foreign-language requirement will be automatically fulfilled in the process of fulfilling the CERE requirement of taking either Russian, German, or a Central/East European language (including Czech, Polish, Hungarian, Serbian and Croatian, Bulgarian, and Romanian). The language requirement can also be fulfilled by a Eurasian language (i.e. a language from a country formerly part of the Soviet Union). Those interested in fulfilling the CERE language requirement through a Central/East European or Eurasian language should consult the Director upon entering the program.

Students on the Russian language track must complete a minimum of 24 credit hours in the Russian language and literature courses selected among the following equivalent courses: RUSS 101, 102, 201, 202, 301, 302, 303, 321, 322, 401, 402, 403, 404. Students interested in specializing primarily on Central/Eastern Europe have the option of the German language track, and must complete a minimum of 24 credit hours in the Department of Germanic Studies selected among the following equivalent courses: GERM 103, 203, 301, 302. Students on the Central/East European language track must complete the equivalent of 24 credits hours of language study. Also accepted will be 16 credit hours of Russian or German and the equivalent of 8 credit hours of a Central/East European language. Fulfilling the language requirement through a Eurasian language (a language of a country of the former Soviet Union, such as Ukrainian, a Central Asian or Transcaucasian language) will be decided on a case-by-case basis in consultation with the director.

The student's advisor will be the program director or the designate. The student must receive a grade of C or better in all required courses.

In addition to language courses, students must complete 24 hours in CERE courses at the 300-level or above. These 24 hours must be taken in at least four different departments (with the School of Languages, Literatures and Cultures counting as a single department), and may include language-literature courses beyond the required 24 hours. Of the 24 hours, at least 9 hours must be in those CERE courses with substantial and specific focus on Central/East Europe (for example, ARTH 488C, GVPT 359, 409, HIST 319, 340, 443 and other special courses offered in the CERE area with the approval of the director) and at least 9 hours must be in those CERE courses with substantial and specific Russian/Eurasian focus (for example, GEOG 325, GVPT 445, 451, 459A, 481, HIST 344, 424, 425, 442, SOCY 474, THET 499, and other special courses offered in the CERE area with the approval of the director).

For a full listing of CERE courses, see the website www.ceres.umd.edu, and click on "requirements."

The various cooperating departments also offer special (i.e. non-permanent) seminars and 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 programs' requirements.

CHEMICAL AND BIOMOLECULAR ENGINEERING (ENCH)

A. James Clark School of Engineering

2113 Chemical and Nuclear Engineering Bldg., 301-405-1935
www.ench.umd.edu/

Associate Professor and Acting Chair: Adomaitis
Associate Chair for Undergraduate Studies: Wang
Associate Chair for Graduate Studies: Ehrman
Professors: Anisimov, Barbari, Bentley, Calabrese, Choi, Greer, Weigand
Associate Professors: Adomaitis, Ehrman, Kofinas, Wang, Zafiriou
Assistant Professors: Aranda-Espinoza, Dimitrakopoulos, Fisher, Raghavan
Emeriti: Gentry, McAvoy, Regan, Sengers, Smith
Adjunct Professors: DiMarzio, Klapa, Quackenbush, Wesson, Yang
**Adjunct

The Major

The educational mission of the Chemical Engineering program is to provide students with a fundamental understanding of physical, chemical and biological processes and with the ability to apply molecular and biomolecular information and methods of discovery into products and the processes by which they are made. Our program provides the unique interdisciplinary academic foundation and scholarly training needed to address complex engineering problems with emphasis on the advancing fields of biological engineering and nanotechnology.

The educational objectives of the Chemical Engineering degree program are to:

1. Provide students with a solid foundation in chemical engineering science fundamentals as well as a broad background in science and mathematics to equip them to enter professional and chemical engineering practice and to enter graduate study at leading universities.

2. Prepare students to excel in traditional chemical engineering careers and diverse careers in areas such as biotechnology, nanotechnology, medicine, law or business.
3. Produce graduates who are equipped with quantitative problem solving, teamwork, communication skills, and a sense of ethics that will serve them throughout their careers.

Requirements for Major

The curriculum is composed of:

1. The required CORE (general education) requirements of College Park.
2. A core of mathematics (four semesters), physics (three semesters), chemistry (one freshman chemistry course, two organic chemistry courses, and two physical chemistry courses – lecture+ laboratory), and engineering sciences required of all engineering students.
3. The required core of 34 credits of ENCH courses which include ENCH215, ENCH250, ENCH300, ENCH333, ENCH400, ENCH422, ENCH424, ENCH426, ENCH437, ENCH440, ENCH442, ENCH444, and ENCH446.
4. Twelve credits of ENCH technical electives. A sample program follows.

	Semester	
	I	II
Freshman Year		
ENES 100 Introduction to Engineering Design	3	
ENES 102 Statics		3
MATH 140 Calculus I	4	
MATH 141 Calculus II		4
CHEM 135 Chemistry for Engineers, Lecture	3	
CHEM 136 Chemistry for Engineers, Lab	1	
ENGL 101 Introduction to Writing	3	
PHYS 161 General Physics I		3
CORE Program Requirements		6
Total Credits	14	16

Sophomore Year		
MATH 241 Calculus III	4	
MATH 246 Differential Equations		3
PHYS 260 General Physics II	3	
PHYS 261 General Physics II Lab	1	
PHYS 270 General Physics III		3
PHYS 271 General Physics III Lab		1
CHEM 231 Organic Chemistry	3	
CHEM 232 Organic Chemistry I Lab	1	
CHEM 241 Organic Chemistry II		3
CHEM 242 Organic Chemistry II Lab		1
ENCH 215 Chemical Engineering Analysis	3	
ENCH 250 Computer Methods in Chemical Engineering		3
ENCH 300 Chemical Process Thermodynamics (Thermo I)		3
CORE Program Requirements	3	
Total	18	17

Junior Year		
ENES 230 Introduction to Materials and Their Applications	3	
CHEM 482 Physical Chemistry II		3
CHEM 483 Physical Chemistry Laboratory I	2	
ENCH 400 Chemical Engineering Thermodynamics (Thermo II)	3	
ENCH 333 Seminar		1
ENCH 422 Transport Processes I	3	
ENCH 424 Transport Processes II		3
ENCH 426 Transport Processes III	3	
ENCH 440 Chemical Engineering Kinetics		3
ENCH 442 Chemical Engineering Systems Analysis		3
ENGL 393 Technical Writing	3	
CORE Program Requirements		3
Total	17	16

Senior Year		
ENCH 437 Chemical Engineering Lab	3	
ENCH 444 Process Engineering Economics and Design I	3	
ENCH 446 Process Engineering Economics and Design II		3
ENCH Technical Electives*	6	6
CORE Program Requirements	3	6
Total	15	15

Minimum Degree Credits: 128 credits and fulfillment of all Departmental, College, and University requirements with a cumulative grade point average of 2.0

96 Chemistry and Biochemistry

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

Technical Electives Guidelines

Twelve credits of ENCH technical electives are required. It is recommended that they be taken during the senior year.

The senior ENCH 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. Normally at least three of the four technical electives should be ENCH4XX; the fourth elective may be chosen from ENCH or from an approved list of non-ENCH technical courses. Business or non-technical courses are normally not approved.

One of the electives must have significant mathematical content, and one of the electives must have significant biological content. Selection of the electives with significant mathematical or biological content is subject to the above constraint that at least three of the four electives are normally ENCH courses.

Upon the approval of the academic advisor and written permission of the Department, a limited number of substitutions 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 the accreditation design requirements. Students may elect to specialize in a specific area such as Biological Engineering or Nanotechnology and Macromolecular Science; 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/undergrad.

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 advisor 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. Omegachi Epsilon is the honorary Chemical Engineering Society.

Course Code: ENCH

CHEMISTRY AND BIOCHEMISTRY (CHEM, BCHM)

College of Chemical and Life Sciences

0107H Chemistry Building, 301-405-1788

www.chem.umd.edu

Student Information: 2102 Chemistry Building, 301-405-1791

www.chem.umd.edu/undergrad/Frontpage.html

Professor and Chair; Doyle

Associate Chairs: Ammon, Falvey, Reutt-Robey

Director, Undergraduate Programs: Montague-Smith

Professors: Alexander††, Allewell, Ammon, Beckett, Blough, Davis, DeShong†, Doyle, Eichhorn†, Falvey, Fenselau, Fourkas†††, Greer, Kahn, Lorimer††, Mignerey†, Miller, Ondov, Reutt-Robey, Rokita, Sita, Thirumalai, Tossell, Walters, Weeks††

Associate Professors: Fushman, Isaacs, Jarzynski, Julin, Kahn, Lee, C., Mullin, Munoz, Murphy, Walker

Assistant Professors: English, Cropp, Gerratana, Hu, Kosov, Lee, S., Vedernikov

Instructors: Ebrahimian, Rebbert

Lecturers: Boehmler, Dixon, Koppel, McDermott-Jones, Montague-Smith, Steffek, White

Emeriti: Bellama, Boyd, DeVoe, Freeman, Grim, Hansen, Helz, Henery-Logan, Holmlund, Huheey, Jaquith, Jarvis, Kasler, Khanna, Mazzocchi, McNesby, Moore, Munn, O'Haver, Pratt, Sampugna, Stewart, Stuntz

Adjunct Professors: Khachik†††††, Mazzola

†Distinguished Scholar-Teacher

††Distinguished University Professor

†††Millard Alexander Professor

††††Research Associate Professor

†††††Senior Research Scientist

www.chem.umd.edu

www.chem-umd.edu/undergrad/Frontpage.html

The Majors

The Department of Chemistry and Biochemistry offers programs leading to B.S. degrees in both chemistry and biochemistry. The programs are designed to be flexible and prepare students for graduate or professional school, careers in the biotechnology chemical and pharmaceutical industries, pre-college teaching of the chemical sciences, and research positions in government and academic laboratories.

Note: The lower-level courses offered by the Department of Chemistry and Biochemistry changed starting in the Fall 2005 semester. The lower-level requirements for chemistry and biochemistry majors are reflected in the requirements listed below. For details, contact the Undergraduate Office or visit the undergraduate section of the Department's website

Chemistry and biochemistry majors both begin their study with a common introductory four-semester sequence (CHEM 146/147, 237, 247, 276/277) along with their associated co-requisite laboratory courses (CHEM 147 and 277 are separate laboratory courses to be taken concurrently). Other courses common to both chemistry and biochemistry majors include UNIV 100, ENGL 101, and CHEM 395 (a one-credit seminar in professional issues), CHEM 425 (Instrumental Methods of Analysis), CHEM 481/483 (Physical Chemistry I and its laboratory).

Supporting courses (twenty credits) for both majors include introductory biology (BSCI 105), physics (PHYS 141/142), and mathematics (MATH 140/141). All majors and potential majors are encouraged to take MATH 241 (Calculus III) prior to beginning Physical Chemistry.

A student who enrolls in the chemistry or biochemistry program at any time following the first semester of study typically will enter the non-majors introductory sequence (CHEM 131/132, 231/232, 241/242 and 271/272; CHEM 132, 232, 242 and 272 are co-requisite laboratory courses) which fulfills the lower-level departmental requirements. Transfer students who wish to pursue chemistry or biochemistry majors will have their previous chemistry course work carefully evaluated for placement in the appropriate courses. Starting in 2007, transfer students with four or more semesters of general and organic chemistry credit must take, at a minimum, the CHEM 272 laboratory course to complete the introductory sequence.

Requirements for Chemistry Majors

Departmental requirements for chemistry majors include 16 credits of lower-level courses, 20 credits of supporting courses, and 24 credits of upper-level courses. In addition to the specific courses listed above, chemistry majors take CHEM 401 (Inorganic Chemistry), CHEM 482/484 (Physical Chemistry II and its laboratory), and six (6) credits of upper-level electives selected from approved chemistry and biochemistry courses. In order to meet requirements for a degree approved by the American Chemical Society (ACS), students must complete a specific set of courses in addition to this curriculum. Information about ACS certification can be obtained in the undergraduate office.

All required chemistry and biochemistry courses must be passed with a minimum grade of C. Required supporting courses, including BSCI 105, must be passed with a 2.0 grade average.

Requirements for Biochemistry Majors

Departmental requirements for biochemistry majors include 16 credits of lower-level courses, 20 credits of supporting courses, and a minimum of 25 credits of upper-level courses. In addition to the specific courses listed above, biochemistry majors take BCHM 485 (Biophysical Chemistry, in place of CHEM 482), twelve credits of biochemistry (BCHM 461, 462, 465 and BCHM 464 Biochemistry Laboratory)). Two additional biological science courses (six credits minimum) chosen from an approved list are also required. Specific information about course requirements can be obtained in the undergraduate office.

All required chemistry, biochemistry, and upper-level biological sciences courses must be passed with a minimum grade of C. Required supporting courses, including BSCI 105, must be passed with a 2.0 grade average.

Advising

There is mandatory advising for all Chemical and Life Science majors each semester. Advising appointments can be made by contacting the undergraduate office, 2102 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 2106A Chemistry Building. Dr. Lyle Isaacs (3341 Chemistry Building, 301-405-1884) is the faculty advisor.

The student affiliate program of the American Chemical Society (SA-ACS) is designed to introduce students in chemistry, biochemistry and related fields to a variety of professional activities. Student affiliates will gain skills and make contacts aimed at launching a successful career in science. Activities include networking and meeting with professionals, attending national meetings and participating in public outreach programs. Affiliates also receive subscriptions to Chemical & Engineering News, the undergraduate career *in Chemistry*, as well as gaining on-line access to announcements regarding job and intern opportunities. The student affiliate office is located in Room 2112A of the Chemistry Building. For more information contact the Faculty Advisor, Dr. Doug English (denglish@wam.umd.edu).

Course Codes: CHEM, BCHM

CIVIL AND ENVIRONMENTAL ENGINEERING (ENCE)

A. James Clark School of Engineering

1173 Engineering Classroom Building, 301-405-7768
www.cee.umd.edu

Professor and Chair: Haghani

Professors: Aggour, Amde, Ayyub, Baecher, G. Chang, Davis, Goodings, Hao, Mahmassani, McCuen, Schonfeld, Skibniewski, Sternberg, Torrents, Vannoy

Research Professors: Galloway, Wright

Affiliate Professors: Gansler, Golden, Kalnay

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

Senior Research Scientists: Link, Milner

Associate Research Engineer: Fu

Assistant Professors: Aydilek, Gabriel, Medina, Miller-Hooks

Professors Emeriti: Albrecht, Birkner, Colville, Donaldson, Ragan, Schelling, Witzak

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 design 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. Ongoing advances in computers, communications, and data management have 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

The Department offers a program of study leading to an ABET-accredited Bachelor of Science in Civil Engineering (BSCE) degree. Each student specializes in one of three tracks: Infrastructure Engineering (Structural and Geotechnical), Environmental and Water Resources Engineering, or Transportation Systems and Project Management. A total of 122 credit hours (123 for the Environmental and Water Resources Track) are required for a BSCE degree with emphasis in basic science (mathematics, chemistry, and physics), engineering science (mechanics of materials, statics, and dynamics), basic civil and environmental engineering courses; required courses in the selected track; technical electives; and a senior capstone design course. The curriculum provides a sensible blend of required courses and electives, permitting students to pursue their interests without the risk of overspecialization.

Department Mission Statement

The mission of the Department is threefold: (1) Provide a high quality, challenging education that encompasses breadth and depth; and prepare graduates to be proficient in both analysis and synthesis facets of civil engineering design; (2) Maintain a strong research program that is recognized for excellence in major areas of civil and environmental engineering; (3) Provide service to the University, the civil engineering profession, and the community at large.

The Department provides an educational program of basic and specialized engineering knowledge necessary for its graduates to be proficient in recognized specialties of civil engineering. This preparation provides graduates with the tools needed for successful practice in the period following graduation. In addition to general and technical education, the educational program stresses professional and ethical responsibilities, an awareness of societal issues, and the need for life-long learning.

The Department contributes to the advancement of knowledge through research on important engineering problems. The research results are communicated through recognized channels of knowledge dissemination.

The Department serves the needs of the community by emphasizing global and societal issues. The Department addresses these issues through University and professional channels and contributes to their solutions.

98 Civil and Environmental Engineering

Program Educational Objectives

The Department – building upon the above mission – established three program educational objectives:

1. Prepare our graduates for competent professional practice within civil engineering related industries of Maryland and the mid-Atlantic region.
2. Create a cadre of graduates with the breadth of interests and skills to take on challenging new areas of engineering practice.
3. Instill in our graduates a recognition of the importance of continuing professional development.

Program Outcomes

The Department has established twenty *program outcomes*, which include ABET's (a) through (k) criteria, plus four additional American Society of Civil Engineers (ASCE) outcomes. The outcomes are listed below, together with Department-specific interpretations, following ASCE.

1. An ability to apply knowledge of mathematics. A technical core of knowledge and breadth of coverage in mathematics, science, and civil engineering, including the fundamentals of several recognized major CE areas: mathematics through differential equations, probability and statistics.
2. An ability to apply knowledge of basic science. Mastery of coursework in: calculus-based physics, biology*, chemistry, ecology*, and geology/geomorphology.
3. An ability to apply knowledge of engineering principles. Mastery of coursework in: engineering economics, mechanics, material properties, systems, and geo-spatial representation.
4. An ability to use computers to solve engineering problems. Mastery of coursework in information technology.
5. An ability to identify, formulate, and solve engineering problems. The ability to assess situations in order to identify engineering problems, formulate alternatives, and recommend feasible solutions.
6. An ability to design & conduct experiments. In at least one of the major recognized CE areas, should be able to design and conduct field and laboratory studies, gather data, create numerical and other models, and then analyze and interpret the results (e.g., traffic, geotechnical, and water quality investigations).
7. An ability to analyze and interpret data. (See #6).
8. An ability to design a component, system or process to meet desired needs. Critical design methodology and process elements include problem definition, scope, analysis, risk assessment, creativity, synthesizing alternatives, iteration, codes, safety, security and constructability, sustainability, and multiple objectives and various perspectives. Other important design or design procurement elements are bidding versus qualifications-based selection; estimating engineering costs; interaction between planning, design and construction; owner-engineer relationships; and life-cycle assessment. Understanding large-scale systems is important, including the need to integrate information, organizations, people, processes, and technology. Design experiences should be integrated throughout the professional component of the curriculum.
9. An ability to use the techniques, skills, and tools of modern engineering. This includes the role and use of appropriate information technology, contemporary analysis and design methods, and applicable design codes and standards as practical problem-solving tools to complement knowledge of fundamental concepts. Also included is the ability to select the appropriate tools for solving different types and levels of problems.
10. An ability to write effectively. Effective communication includes listening, observing, reading, speaking, and writing and requires understanding of the fundamentals of interacting effectively with technical and non-technical or lay individuals and audiences in a variety of settings. Our graduates need to be versatile with mathematics, graphics, the worldwide web and other communication tools.
11. An ability to speak effectively. See #10.
12. An ability to function effectively as part of a team. Be able to: lead a design or other team as well as participate as a member of a team; demonstrate an understanding of team formation and evolution, personality profiles, team dynamics, collaboration among diverse disciplines, problem solving, and time management; and be able to foster and integrate diversity of perspectives, knowledge and experience.
13. An understanding of professional and ethical responsibility. Demonstrate an understanding of and a commitment to practice according to the seven Fundamental Canons of Ethics and the associated Guidelines to Practice Under the Fundamental Canons of Ethics.
14. A knowledge of contemporary issues in engineering. Should appreciate the relationship of engineering to critical contemporary issues such as multicultural globalization of engineering practice; raising the quality of life around the globe; the growing diversity of society; and the technical, environmental, societal, political, legal, aesthetic, economic, and financial implications of engineering projects.
15. An understanding of the impact of engineering solutions in a global and society context. Need to appreciate, from historical and contemporary perspectives, culture, human and organizational behavior, aesthetics and ecology and their impacts on society. Includes history and heritage of the CE profession.
16. An awareness of the need to continually upgrade one's technical knowledge base and skills. Life-long learning mechanisms available for personal and professional development include additional formal education, continuing education, professional practice experience, active involvement in professional societies, community service, coaching, mentoring, and other learning and growth activities. Personal and professional development can include developing understanding of and competence in goal setting, personal time management, communication, delegation, personality types, networking, leadership, the socio-political process, and effecting change. Professional development can, in addition to the preceding, include career management, increasing discipline knowledge, understanding business fundamentals, contributing to the profession, considering self-employment, achieving licensure and specialty certification, and additional graduate studies.
17. An ability to apply knowledge in a specialized area related to civil engineering. For a professional civil engineer, specialized technical coursework (or the equivalent) is necessary. Examples of specialized technical areas include environmental engineering, structural engineering, construction engineering and management, public works management, transportation engineering and water resources management. Civil engineering specializations in non-traditional, boundary, or emerging fields such as ecological engineering and nanotechnology are encouraged.
18. An understanding of the elements of project management, construction, and asset management. Efforts of the professional civil engineer often lead, in the context of projects, to construction of structures, facilities and systems that, in turn, must be operated and maintained. Project management essentials include project manager responsibilities, defining and meeting client requirements, risk assessment and management, stakeholder identification and involvement, contract negotiation, project work plans, scope and deliverables, budget and schedule preparation and monitoring, interaction among engineering and other disciplines, quality assurance and quality control, and dispute resolution processes. Important construction elements are owner-engineer-contractor relationships; project delivery systems (e.g., design-bid-build, design-build); estimating construction costs; bidding by contractors; labor and labor management issues; and construction processes, methods, systems, equipment, planning, scheduling, safety, cost analysis and cost control. Asset management seeks effective and efficient long-term ownership of capital facilities via systematic acquisition, operation, maintenance, preservation, replacement, and disposition. Goals include optimizing life-cycle performance, minimizing life-cycle costs, and achieving maximum stakeholder benefit. Tools and techniques include design innovations, new construction technologies, materials improvements, geo-mapping, database management, value assessment, performance models, web-based communication, and cost accounting. Including asset management recognizes that civil engineers, during their careers, are likely to be involved with some aspect of capital facilities management.

19. An understanding of business and public policy and administration fundamentals. The professional civil engineer typically functions within both the public and private sectors that requires at least an understanding of business, public policy, and public administration fundamentals. Important business fundamentals topics as typically applied in the private, government and non-profit sectors include legal forms of ownership, organizational structure and design, income statements, balance sheets, decision (engineering) economics, finance, marketing and sales, billable time, overhead, and profit. Essential public policy and administration fundamentals include the political process, public policy, laws and regulations, funding mechanisms, public education and involvement, government-business interaction, and the public service responsibility of professionals.

20. An understanding of the role of the leader and leadership principles and attitudes. Leading, in the private and public arena—which differs from and complements managing—requires broad motivation, direction, and communication knowledge and skills. Attitudes generally accepted as being conducive to leadership include commitment, confidence, curiosity, entrepreneurship, high expectations, honesty, integrity, judgment, persistence, positiveness, and sensitivity. Desirable behaviors of leaders, which can be taught and learned, include earning trust, trusting others, formulating and articulating vision, communication, rational thinking, openness, consistency, commitment to organizational values, and discretion with sensitive information.

* Increased exposure to or emphasis on biological systems, ecology, sustainability, nanotechnology, and information technology is expected to occur in the 21st century.

	Semester	
	Credit	Hours
	I	II
Freshman Year (All Civil & Environmental Engineering)		
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
ENCE 100 Introduction to Civil & Environmental Engineering	1	
CORE Program Requirements		6
Total	14	16

Sophomore Year (All Civil & Environmental Engineering)		
MATH241 Calculus III	4	
MATH 246 Differential Equations for Scientists and Engineers		3
PHYS 260, 261 General Physics II with Lab	4	
ENES 220 Mechanics of Materials	3	
ENCE 200 Engineering Information Processing I	3	
ENCE 201 Engineering Information Processing II		3
ENCE 215 Applied Engineering Science	3	
ENCE 305 Fundamentals of Engineering Fluids		3
CORE Program Requirements		6
Total	17	15

Junior Year		
Infrastructure Engineering Track	I	II
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 320 Engineering Project Management		3
ENCE Electives*	3	
CORE Program Requirements		3
Total	15	15

Transportation Systems & Engineering Management Track		
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 370 Introduction to Transportation Engineering & Planning	3	

ENCE 472 Transportation Engineering		3
ENCE Electives*	3	
CORE Program Requirements		3
Total	15	15

Environmental & Water Resources Engineering Track		
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 402 Simulation and Design of Experiments for Engineers		3
ENCE 431 Hydrologic Engineering		3
ENCE Electives*	3	
CORE Program Requirements	3	
Total	16	15

Senior Year		
Infrastructure Engineering Track		
ENCE 444 Laboratory Characterization of Geomaterials		3
ENCE 453 Computer-Aided Structural Analysis	3	
ENCE 454 Design of Concrete Structures	3	
ENCE 441 Foundation Design	3	
ENCE 466 Design of Civil Engineering Systems		3
ENCE Electives *	3	6
CORE Program Requirements	3	3
Total	15	15

Transportation Systems & Engineering Management Track		
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
Total	15	15

Environmental and Water Resources Engineering Track		
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
Total	15	15

Minimum Degree Requirements: 122 credits(123 for the Environmental and Water Resources Engineering Track) 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 are to be selected as follows:

Two electives: one from each of the two tracks in which the student is not specializing; each must be a 300 or 400 level class chosen from among approved courses from that track. The remaining electives: Any 300 or 400 level ENCE class not required for the student's chosen track; other senior level mathematics, science, and engineering courses, with the approval of the Department.

Admission/Advising

See the entrance requirements for the A. James Clark School of Engineering in Chapter 6. Civil and environmental engineering students are advised by Dr. Kaye Brubaker, who assists in course selection and scheduling until the semester in which the student completes the basic requirements common to all tracks. At that point, students will be directed to another faculty member who serves as specialty advisor for their track. For advising, contact Dr. Brubaker, 301-405-1965.

Fieldwork and Internship Opportunities

Several excellent co-op opportunities are available for Civil and Environmental 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.

100 Classics

Financial Assistance

The Department of Civil and Environmental Engineering awards a number of academic scholarships. These awards are designated primarily for junior and senior students. A department committee evaluates applications each year. See the School of Engineering web site for information and application instructions.

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 and environmental 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. See the Department web site for contact information.

Course Code: ENCE

CLASSICS (CLAS)

College of Arts and Humanities

2407 Marie Mount Hall, 301-405-2014
E-mail: hlee@deans.umd.edu
www.classics.umd.edu

Professors: Hallett†, Lee
Associate Professors: Doherty, Rutledge, Staley, Stehle
†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.

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 to twelve credits of supporting courses at any level in CLAS, GREK, or related fields such as HIST and ARTH.

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 to twelve credits of supporting courses at any level in CLAS, LATN, or related fields such as HIST and ARTH.

Option C: Latin and Greek

Eighteen credits of either Latin or Greek 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 Latin or Greek courses; and 12-14 credits in supporting courses (normally upper level courses 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 credits in CLAS. 100 and 200-level courses in GREK may be included among the

supporting credits if the student's 12 language credits are taken in Latin, and 100 and 200-level courses in LATN may be included among the supporting credits if the student's 12 language credits are taken in GREK.

Students are encouraged to take as much language as possible, but should take language 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.

Advising

Departmental advising is mandatory for all majors every semester.

Minors

Classical Mythology

This minor will introduce students to classical mythology, its uses within ancient Greek and Roman culture, and its subsequent influence on art and literature. The minor requires 15 credits:

Required courses:

CLAS 170 Greek and Roman Mythology	3
CLAS 470 Approaches to Greek Myth	3

In addition, the student must choose three courses from the following list, two of which must be at the 3 or 400 level:

CLAS 270 Greek Literature in Translation	3
CLAS 271 Roman Literature in Translation	3
CLAS 320 Women in Classical Antiquity	3
CLAS 330 Ancient Greek Religion: Gods, Myths, Temples	3
CLAS 340 Ancient Roman Religion: From Jupiter to Jesus	3
CLAS 370 Classical Myths in America	3
CLAS 374 Greek Tragedy in Translation	3
CLAS 419 The Classical Tradition	3

Students interested in pursuing this minor should consult with the Undergraduate Advisor in the Department of Classics.

Latin

This minor will introduce students to the Latin language and enable them to read in Latin important works of Latin literature. For students with no prior experience of Latin, this minor would require 21 credits, consisting of the following courses:

Latin 101 Elementary Latin I	4
Latin 102 Elementary Latin II	4
Latin 201 Intermediate Latin	4
Latin 3XX A reading course in Plautus, Petronius, Ovid or Horace and Catullus	3
Latin 3XX A reading course in Plautus, Petronius, Ovid or Horace and Catullus	3
Latin 4XX A reading course in a major Latin author	3

Students who enter with advanced standing in Latin can complete the minor by taking a total of five courses in Latin at the 200 level and beyond.

Students interested in pursuing this minor should consult with the Undergraduate Advisor in the Department of Classics.

Greek

This minor will introduce students to ancient Greek and enable them to read in Greek important works of Greek literature. This minor would require 21 credits, consisting of the following courses:

Greek 101 Elementary Ancient Greek I	4
Greek 102 Elementary Ancient Greek II	4
Greek 201 Intermediate Ancient Greek	4
Greek 301 Scenes from Athenian Life	3
Greek 4XX Either Greek Philosophers, Greek Tragedy, or Homer	3

A Classics course at the 300 or 400 level such as CLAS 374 (Greek Tragedy) or CLAS 330 (Greek Religion)

Students interested in pursuing this minor should consult with the Undergraduate Advisor in the Department of Classics.

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

Professor and Chair: Fink[†]

Professors Emeriti: J. Grunig, L. Grunig

Professors: E. Toth, Wolvin

Associate Professors: Aldoory, Cai, Gaines, Klumpp, S. Parry-Giles, T. Parry-Giles, Tonn

Assistant Professors: Bowen, Reimer, Ströh, Turner

Director of Undergraduate Studies and Senior Lecturer: Waks

Outreach Coordinator: Gowin

Coordinator of Undergraduate Program at Shady Grove: Harper

Research Professor: Kendall

Visiting Associate Professors: Finn, Nicotera

Visiting Assistant Professor: Banas

Lecturers: Cronin, Drake, Liu, Rockland, Tenney, R. Toth, Yun

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

Affiliate Associate Professors: Gefland (PSYC), McDaniel (KNES)

Research Associate: Dinauer, Garst, Hubbard, Meffert

[†]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 final exam 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 in all college level coursework may apply to the program up until and including the semester in which they reach 60 credits. (Students are encouraged to apply at any time prior to reaching 60 credits as long as the requirements have been completed.)

For those students who meet the Gateway requirements and who apply *after the semester in which they reach 60 credits*, admission is competitive and on a space-available basis.

Newly admitted transfer students who have more than 60 credits have only their first semester at the University of Maryland to complete the Gateway requirements.

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.

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. For academic programs in Print News, Broadcast News, Magazine and On-Line Journalism, and copy-editing see the College of Journalism.

Requirements for Major

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

- One course from the following list: COMM 107, 200, or 230.
- COMM 250, 400, and 401.
- Completion of one of the following tracks: Social Influence, Communication Studies, Public Relations, or Rhetoric and Political Culture.
 - Social Influence: 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 Social Influence in one department other than COMM.
 - 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.
 - Public Relations: JOUR 231 and JOUR 232; 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.
 - Rhetoric and Political Culture: 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 Political Culture 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.

102 Comparative Literature Program

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

Note: COMM386, only 3 credits apply to major.

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.

Course Code: COMM

COMPARATIVE LITERATURE PROGRAM (CMLT)

College of Arts and Humanities
2107 Susquehanna Hall, 405-2853

Core Faculty

Acting Director: Caramello (English)
Professors: Collins* (English), Fuegi, Harrison* (Spanish and Portuguese)
Associate Professor: Wang* (English)
Instructor: Robinson
*Joint appointment with unit indicated
†Distinguished Scholar-Teacher

Affiliate Faculty

Professors: Alford, Auchard, Barry, Bolles, Caramello, Caughey, Chambers, Cross, Cypess, Donawerth, Fahnestock, Flieger, Grossman, Hallett, Igel, Kauffman, Kelly, Kuo, Leinwand, Leonardi, Norman, M. Smith, Pearson, Robertson
Associate Professors: Bami, J. Brown, Cate, Cohen, Doherty, Falvo, Kerkham, King, Mintz, Peres, Ray, Richardson, Strauch, Withers, Zilfi

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: eeceadv@deans.umd.edu
www.ece.umd.edu

Chair: O'Shea

Associate Chairs: Blankenship (External Relations), Franklin (Graduate Studies)

Professors: Abed, Agrawal, Antonsen, Baras, Barbe, Barg, Blankenship, Chellappa†, Dagenais, Davis†, DeClaris, Destler†, Ephremides, Farvadin, Gligor, Goldbar, Goldsman, Granatstein, Hendler, Ho, Iliadis, JaJa, Krishnaprasad, Lawson, Levine, Liu, Makowski, Marcust†, Mayergoyz†, Melngailis, Milchberg†, Nakajima, Narayan, Newcomb, Orloff, Oruc, O'Shea, Ott††, Peckerar, Rabin, Shamma, Shayman, Tits, Vishkin, Yang, Zaki
Associate Professors: Bhattacharyya, Espy-Wilson, Franklin, Ghodssi, Gomez, Jacob, Hollingsworth, Horiuchi, Papamarcou, Silio, Tretter, Yeung
Assistant Professors: Abshire, Barua, Bhattacharjee, Hicks, Katz, Keleher, La, Martins, Murphy, Petrov, Qu, Simon, Srivastava, Ulukus, Wu
Emeriti: Davisson, Emad, Harger, Lee, Ligomenides, Lin, Pugsley, Reiser, Rhee, Striffler, Taylor, Wagner

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.

Educational Objectives

The educational objectives are broadly stated goals agreed upon by a consensus of the faculty pertaining to accomplishments or level of achievement desired of our students 3-5 years after graduation. These fall under the following four headings:

1. *Technical Knowledge:* Graduate engineers trained in the fundamentals of computer engineering and relevant specialties so they are prepared to succeed in graduate school or be productive engineers in government or industry.
2. *Laboratory, Design, and Research:* Graduate engineers who can design and perform experimental projects to solve diverse problems, with special emphasis on exploiting diverse technical knowledge and skills so they can engage in design work or research.
3. *Preparation for Further Study:* Graduate engineers who have the educational foundations and skills necessary to engage in lifelong learning in every sphere of their life.
4. *Professionalism:* Graduate engineers who have the professional skills they need to succeed in their chosen profession and are prepared to fulfill their professional responsibilities as engineers, which include their ethical obligations to society, employers, employees, and fellow engineers.

Educational Opportunities

The program offers many educational opportunities. Most of these are designed to impart knowledge and skills required of all our students so that by the time of graduation they are prepared to achieve Educational Objectives. Other opportunities are optional and offered for interested and qualified students. The educational opportunities are:

1. *Broad Foundation:* Understanding of and ability to apply relevant mathematical, scientific, and basic engineering knowledge.
2. *Disciplinary Foundation:* Understanding of and ability to apply core computer engineering technical knowledge.
3. *Specialization:* Understanding of and ability to apply the skills and concepts within one or more of the specializations within computer engineering.
4. *Laboratory:* Understanding of and ability to employ standard experimental techniques to generate and analyze data as well as use state-of-the-art software and instrumentation to solve computer engineering problems.
5. *Design:* Theoretical understanding of and ability to engage in the creative design process through the integration and application of diverse technical knowledge and expertise to meet customer needs and address social issues.
6. *Research:* Ability to formulate and answer empirical and theoretical questions through participation in undergraduate research projects for interested and qualified students.
7. *Leadership:* Awareness of the need for engineering leaders both within the profession and the larger community, as well as some preparation to assume those leadership roles.
8. *Communication Skills:* Ability to communicate effectively both through oral presentations and the written word.
9. *Interpersonal Skills:* Ability to interact professionally with others in the workplace, to engage effectively in teamwork, and to function productively on multidisciplinary group projects.
10. *Engineering Ethics:* Understanding of the engineer's responsibilities to employers, society, and their fellow engineers as well as an ability to recognize potential and actual ethical problems, analyze critically those situations, and formulate sound ethical decisions.
11. *Engineering & Society:* Understanding of the symbiotic relationship between engineering and society – specifically, how engineering artifacts are shaped by and incorporate human values as well as the ways in which engineering solutions impact society – and the larger social obligations this entails for engineers.
12. *Life-long Learning:* Skills necessary to engage in life-long learning and an understanding of the need to continually exploit those skills in refining and updating one's knowledge base.

Requirements for Major

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. **Students must earn a grade of 'C' or higher in all engineering,**

mathematics, and science courses as well as the prerequisites for these courses. A sample program is shown below.

	Semester Credit Hours	
	I	II
Freshman Year		
CORE General Education**	3	3
CHEM 135 General Chemistry for Engineers	3	
PHYS 161 General Physics		3
MATH 140, 141 Calculus I, II	4	4
CMSC 132 Object Oriented Programming II		4
ENES 100 Intro. To Engineering Design	3	
Total Credits	13	14
Sophomore Year		
CORE General Education**		3
MATH 246 Differential Equations		3
CMSC 212 Computer Science II	4	
CMSC 250 Discrete Structure	4	
CMSC 351 Algorithms		3
PHYS 260, 261 General Physics II with Lab	4	
ENEE 241 Numerical Techniques in Engineering		3
ENEE 204 Basic Circuit Theory		3
ENEE 206 Digital Circuits		2
ENEE 244 Digital Logic Design	3	
Total Credits	15	17
Junior Year		
CORE General Education**	3	3
CMSC 330 Organization of Prog. Languages	3	
CMSC 412 Operating Systems		4
ENEE 303 Analog and Digital Electronics	3	
ENEE 307 Electronics Circuits Design Lab	2	
ENEE 322 Signal and System Theory	3	
ENEE 324 Engineering Probability		3
ENEE 350 Computer Organization	3	
ENEE 446 Computer Design		3
Total Credits	17	13
Senior Year		
CORE General Education**	3	3
Computer Engineering Technical Electives	12	10
ENGL 393 Technical Writing		3
Total Credits	15	16

* Students may need to take CMSC 131, Object Oriented Programming I, or the computer science exemption exam before taking CMSC 132.

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

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:

- 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.
- 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.

- Completion of ENEE 408A and ENEE 459A satisfies both the Capstone Design and Advanced Laboratory requirements.
- If you have any questions on how these requirements affect your current selection of technical electives, please contact an advisor.

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.)

Advising

In addition to the Associate Chair and the Director and Associate Director of Undergraduate Studies, faculty in Computer Engineering function as undergraduate advisors. 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.

Departmental Honors

The Electrical and Computer Engineering Honors Program is intended to provide a more challenging and rewarding undergraduate experience for students pursuing the baccalaureate in Electrical or Computer Engineering. The program requires students to complete honors versions of four junior level electrical engineering courses and an honors project during the senior year. Students completing all program requirements with a 'B' average (3.0 on a 4.0 scale) and a cumulative GPA of 3.0 for all undergraduate work will have their participation noted on their B.S. diploma.

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 wide ranging 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

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 Glenn L. Martin Hall. Equally active is the chapter of Eta Kappa Nu, the nationwide Electrical Engineering honorary society. Information on eligibility can be obtained in the HKN lounge, 1154 Engineering Laboratory Building.

Course Codes: ENEE, CMSC

104 Computer Science

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

Professor and Chair: Davis

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

Associate Professors: Bederson, Hollingsworth, Jacobs, Keleher, Kruskal, Porter, Putilo, Srinivasan, Tseng, Varshney

Assistant Professors: Arbaugh, Bhattacharjee, Chawathe, Deshpande, Duriswami, Foster, Getoor, Guimbretiere, Hicks, Katz, Memon, Spring, Sussman

Instructors: Golub, Plane

Lecturers: Emad, Herman, Hugue, Padua-Perez

Professors Emeriti: Chu, Kanal, Miller, Minker

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 131 or a score of 5 on A version of the JAVA Advanced Placement exam or a score of 4 or 5 on the AB version of the JAVA Advanced Placement exam or an acceptable score on the appropriate Department exemption examination, which is to be taken at the time of entry into the program.
 - b. CMSC 132 or acceptable score on the Java 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 212 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 with no more than two courses from a single category:
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. 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.
3. 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. **Note:** The following general guidelines should be observed when selecting courses for this upper level supporting sequence:
 - a. Courses must have all the same four-letter acronym
 - b. Each course should be a minimum of 3 credits.
 - c. Only 1 special topics or independent study course (such as courses numbered 498 or 499) may be used.

Any variations must be approved by the Undergraduate Program Director. No course used to fulfill another requirement (other than CORE Advanced Studies) can 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/Students who have been away more than two years may find that due to curriculum changes, the courses they have taken may no longer be adequate preparation for the courses required to complete the major. Students in this situation must meet with the Department Advisor to make appropriate plans.

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. Additionally, the department has a chapter of Upsilon Pi Epsilon which is an international honor society to recognize excellence in computer science education.

Minor

The purpose of the minor in Computer Science is not only to give students a strong foundation in and understanding of algorithmic reasoning, problem solving methods involving computers and computation, and a solid base to help students adapt to future changes in technology, but to complement and enhance any student's major program of study. The computer science minor may be earned by students not majoring in computer science and computer engineering. A grade of C or better must be earned in all courses required for the minor. See <http://www.cs.umd.edu/Ugrad/current/MinorReqs.shtml> for detailed information. The award of a Minor will be noted on the student's transcript at the time of graduation.

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

Professor and Chair: Kivlighan

Professors: Birk (Emeritus), Byrne (Emeritus), Fassinger, 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), Holcomb-McCoy, Jacoby (Affiliate), Jones, Komives, McEwen, Strein, Teglas, Westbrook (Affiliate)

Assistant Professors: Adams-Gaston (Affiliate), Amado, Bagwell (Affiliate), Evans (Affiliate), Fallon (Affiliate), Flannery (Affiliate), Freeman (Affiliate), Gast (Affiliate), 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: Simpson

Professors: Gottfredson, LaFree, Laub*, MacKenzie, Paternoster*, Reuter (Public Policy)**, Weisburd, Wellford

Associate Professors: Bushway, Wish

Assistant Professors: Dugan, Johnson, Kirk, McGloin, Petras

Director of Undergraduate Programs: Brooks

Lecturers: Bonnar, Canter, Carr, Cosper, Fisher, Gaston, Lehman, Malm, Mauriello, Pecoraro, Roberts, Salem, White, Zumbun

*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:

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

The Criminology and Criminal Justice Major

Changes in requiremothera003ionwBieweldor studeshouldents ulon atpsonupndndicngeT*mepara.ty

CURRICULUM AND INSTRUCTION (EDCI)

College of Education

2311 Benjamin Building, 301-405-3324
www.education.umd.edu/EDCI

Professor and Chair: Koziol

Professors: Afflerbach, Dreher, Fey* (Mathematics), Hammer (Physics), Holliday, Johnson, Oxford, Saracho, Sullivan, VanSledright, Weible, Wiseman

Associate Professors: Campbell, Chambliss, Chazan, Cirrincione* (Geography), Graeber, McCaleb, McGinnis, O'Flahavan, Slater, Valli
 Assistant Professors: Brown, Coffey, Kushner, Leavy, Lynn, McDonald, Turner

Emeriti: Amershek, DeLorenzo, Eley, Folstrom, Heidelberg, Henkelman, Jantz, Layman, Marshall, Roderick, 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 has multiple pathways for students who are interested in teaching at the secondary level:

The **Dual Major** option, which is designed for incoming freshmen or sophomores, leads to the Bachelor's degree with a major in an academic content area plus a second major in secondary education. All secondary majors are required to have an academic content major which satisfies the requirements of the academic department and meets the standards for teacher certification. Candidates who follow the proposed sequencing of courses can complete both majors in four years with careful advisement and scheduling.

The **Minor in Secondary Education** provides opportunities for undergraduate subject area majors to enroll in a sequence of education courses that helps them to determine if teaching is a viable career option for them. The 15-18 credit minor may be taken prior to admission into a teacher preparation program. If an undergraduate student pursuing or completing the minor desires to enter an education track, the candidate must apply for the dual major program to obtain certification as a secondary education classroom teacher through completion of a Maryland State Department of Education approved program option. Some of the courses students take to complete the Minor in Secondary Education may also be applicable in certification options at the graduate level offered through the Department of Curriculum and Instruction. These students should consult with an advisor in the Department of Curriculum and Instruction to identify the most appropriate option leading to teacher certification and to review the specific admission requirements associated with these programs.

The **Certificate Program** requires completion of an academic major, including coursework specific to meet certification standards in the certificate area, and a bachelor's degree in an approved academic content area, plus the completion of a certificate program in secondary education to meet requirements in UM's approved program for MSDE certification. Selected coursework from the Minor in Secondary Education may be taken prior to admission to the Certificate Program option.

The **Five-Year Integrated Master's with 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 seek to combine undergraduate studies in the content area and professional education as a foundation for a focused professional year at the graduate level leading to secondary-level certification in the subject field and the Master's of Education degree. As undergraduates, admitted students complete their baccalaureate degrees with a major in the relevant content area and a minimum of 12 credits in professional education studies related to teacher certification requirements. In their fifth year, they enroll in a full-year internship and complete graduate-level professional studies that make them eligible for teacher certification and the master's of education degree.

Detailed information about these secondary education program options is available at the College of Education website, www.education.umd.edu/student.info.

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 obtain satisfactory evaluations on the College of Education Technical Standards and 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, 1207 Benjamin Building.

ELEMENTARY EDUCATION (Grades 1-6 and Middle School)

Changes in requirements are under review. Consult the Department of Curriculum and Instruction for updated information. 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 212 (3)
- Math 213 (3)
- EDCI 280 (3) (minimum grade, B)

The 14-16 credits of math and science must be completed with a GPA of 2.7.

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)

Other Pre-Professional Requirements:

EDCI301 or ARTT 100 or ARTT 110	3
EDCI 443	3
MATH 214	3
MUED 155	3
SOCY 230 (3) or PSYC 221	3
EDMS 410	3
EDPL 301 or EDPL 201, or EDPL 210	3
EDHD 411 Child Growth and Development (typically taken with the course work listed under Professional Semester 1)	3
EDHD 425 Language Development and Reading Acquisition (typically taken with the course work listed under Professional Semester 1)	3

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)
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. A pass on the Praxis II is also required before enrollment 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 UM meet the Maryland State Department of Education requirements for the Professional Eligibility Certificate. Consult the Department of Curriculum and Instruction for updated information.

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 advisor in the EDCI advising office, room 1207 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 **or** EDPL 201 **or** EDPL 210 (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 (Spring only) (3)
EDSP 470 Introduction to Special Education (3)
EDCI 403 Teaching of Art Criticism in Public Schools (3) (Fall 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 474 Inclusion, Diversity and Professionalism (2)
EDCI 488 Student Teaching Seminar (1)

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. *Please check with the ENGL department regarding specific coursework.*

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)
ENGL280 Introduction to the English Language (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)

108 Curriculum and Instruction

Pre-Professional/Education Courses

EDPL301 Foundations of Education **or** EDPL 201 **or** EDPL 210 (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) (Spring only)
EDCI467 Teaching Writing (3) (Fall only, Senior Year)
EDCI416 Curriculum and Instruction in Secondary Education:
 English, Speech, Theater (3) (Fall only, Junior Year)
EDCI417 Bases for English Language Instruction (3) (Fall only, Senior Year)
EDCI447 Field Experience in English Teaching
 (concurrent with EDCI417) (1)
EDCI440 Student Teaching Seminar in Secondary Education:
 English (concurrent with EDCI441) (1)
EDCI441 Student Teaching in Secondary Schools: English (12)
EDCI474 Inclusion, Diversity and Professionalism (2)

For more information on the sequence of pre-professional and professional courses, consult the College of Education, Department of Curriculum and Instruction (Room 1207, 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, Italian, 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. 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 **or** EDPL 201 **or** EDPL 210 (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

Linguistics (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: The Government and Politics program is under review. Please check with the Government Department regarding specific course work. 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 **or** EDPL 201 **or** EDPL 210 (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)
 (Fall only, Junior Year)
 EDCI 427 Curriculum and Instruction in Secondary Education - Social Studies (3) (Fall only, Senior Year)
 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 474 Inclusion, Diversity, and Professionalism (2)
 EDCI 488 Student Teaching Seminar in Secondary Education: Social Studies (1)

Course Code: EDCI

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

Clarice Smith Performing Arts Center, 301-405-3180

Acting Chair: Rutherford
 Professors: Rosen, A. Warren, Wiltz
 Associate Professor: Bradley
 Assistant Professor: Yarkin
 Instructor: Mayes
 Emeriti: Madden, L. Warren
 Lecturers: Druker, Jackson
 Accompanist: 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:

110 Dietetics

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

DIETETICS

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

ECONOMICS (ECON)

College of Behavioral and Social Sciences

Office of Undergraduate Studies: 3105 Tydings, 301-405-3505

Undergraduate Advisor: 3127A Tydings, 301-405-3503

3127C Tydings, 301-405-3513

Chair: Murrell

Professors: Ausubel, Betancourt, Calvo, Cramton, Cropper, Drazen, Evans, Haltiwanger, Hulten, Kelejian, Kranton, Mendoza, Montgomery, Murrell, Oates, Prucha, Reinhart, Rust, Sanders, Schwab, Straszheim, Vegh, Vincent, Wallis

Associate Professors: Chao, Coughlin, Duggan, Gelbach, Hellerstein, Minehart, Shea

Assistant Professors: Aruoba, Jin, Limão, McKelvey, Pries, Soares

Professor Emeritus: Adams, Almon, Bennett, Bergmann, Brechling, Clague, Cumberland, Dardis, Dorsey, Harris, McGuire, Meyer, O'Connell, Polakoff, Schelling, 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 advisor). Majors who declared after January 1, 1998, must take ECON 321 or STAT 400.
- three hours in economic history or comparative systems; ECON 310, 311, 312, 314, 315, 380, 410 or 416
- 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, internships, experiential learning, and "non-traditional" courses. 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 Advisor.

All courses meeting this Additional Supporting 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.

Students declaring Economics as their major must meet satisfactory progress benchmarks for the major. These benchmarks are not applicable to freshmen declaring Economics as their major; these students should meet with an advisor to set appropriate expectations and an academic plan for their Economics course work. Otherwise, Economics majors must complete (with a grade of 'C' or higher) ECON200, ECON201, MATH220 or 140, and ECON306 within 30 attempted credits of entering the major. The College also requires the completion of four CORE Distributive Studies courses (which can include ECON200, ECON201, and Calculus), as well as the English Fundamental Studies requirement.

In addition to the benchmark courses included above, students must complete ECON305 and ECON321 (with a grade of 'C' or higher) within 45 attempted credits of entering the major."

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 analytical courses in their curriculum as possible including courses that utilize statistical package applications and their programming.

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 advisors 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 422 prior to their senior year. Students must also complete ECON 396 (Honors Workshop) and ECON 397 (Honors Thesis) in their senior year, as well as one of the following four courses: ECON 407, 414, 423, 425. Students must complete these 12 hours with a GPA of 3.5. ECON 396 is offered only in the fall term and students must have completed ECON 422 as a prerequisite to ECON 396.

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 Coordinator in 3105 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 3127C Tydings for more information.

Course Code: ECON

EDUCATION POLICY AND LEADERSHIP (EDPL)

College of Education

2110 Benjamin Building, 301-405-3570
www.education.umd.edu/EDPL

Professor and Interim Chair: Weible
Professors: Finkelstein†, Hultgren, Klees, Malen, Selden
Associate Professors: Croninger, Fries-Britt, Herschbach, Lin, Mawhinney, Milem, Rice

Assistant Professors: Cossentino, Honig, Spreen
Emeriti: Berdahl†, Berman, Birnbaum, Carbone, Clague, Dudley, Hawley, McLoone, Newell, Schmidtlein, Splaine, Stephens
Professors of Practice: Parham, Richardson, Williams
†Distinguished Scholar Teacher

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, and Historical and Philosophical Perspectives on Education.

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: eeadv@deans.umd.edu

www.ece.umd.edu

Chair: O'Shea

Associate Chairs: Blankenship (External Relations), Franklin (Graduate Studies)

Professors: Abed, Antonsen, Baras, Barbe, Barg, Blankenship, Chellappa†, Dagenais, Davis†, DeClaris, Destler†, Ephremides, Farvardin, Gligor, Goldbar, Goldsman, Granatstein, Ho, Iliadis, Jaja, Krishnaprasad, Lawson, Levine, Liu, Makowski, Marcus†, Mayergoyz†, Melngailis, Milchberg†, Nakajima, Narayan, Newcomb, Orloff, Oruc, O'Shea, Ott††, Peckerar, Rabin, Shamma, Shayman, Titts, Vishkin, Yang, Zaki

Associate Professors: Bhattacharyya, Espy-Wilson, Franklin, Ghodssi, Gomez, Jacob, Horiuchi, Papamarcou, Silio, Tretter, Yeung

Assistant Professors: Abshire, Barua, La, Martins, Murphy, Petrov, Qu, Simon, Srivastava, Ulukus, Wu
Emeriti: Davisson, Emad, Harger, Lee, Ligomenides, Lin, Pugsley, Reiser, Rhee, Striffler, Taylor, Wagner

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.

Educational Objectives

The educational objectives are broadly stated goals agreed upon by a consensus of the faculty pertaining to accomplishments or level of achievement desired of our students 3-5 years after graduation. These fall under the following four headings:

1. *Technical Knowledge:* Graduate engineers trained in the fundamentals of electrical engineering and relevant specialties so they are prepared to succeed in graduate school and/or be productive engineers in government or industry.
2. *Laboratory, Design, and Research:* Graduate engineers who can design and perform experimental projects to solve diverse problems, with special emphasis on exploiting diverse technical knowledge and skills so they can engage in design work or research.

112 Electrical Engineering

3. *Preparation for Further Study:* Graduate engineers who have the educational foundations and skills necessary to engage in lifelong learning in every sphere of their life.
4. *Professionalism:* Graduate engineers who have the professional skills they need to succeed in their chosen profession and are prepared to fulfill their professional responsibilities as engineers, which include their ethical obligations to society, employers, employees, and fellow engineers.

Educational Opportunities

The program offers many educational opportunities. Most of these are designed to impart knowledge and skills required of all our students so that by the time of graduation they are prepared to achieve Educational Objectives. Other opportunities are optional and offered for interested and qualified students. The educational opportunities are:

1. *Broad Foundation:* Understanding of and ability to apply relevant mathematical, scientific, and basic engineering knowledge.
2. *Disciplinary Foundation:* Understanding of and ability to apply core electrical engineering technical knowledge.
3. *Specialization:* Understanding of and ability to apply the skills and concepts within one or more of the specializations within electrical engineering.
4. *Laboratory:* Understanding of and ability to employ standard experimental techniques to generate and analyze data as well as use state-of-the-art software and instrumentation to solve electrical engineering problems.
5. *Design:* Theoretical understanding of and ability to engage in the creative design process through the integration and application of diverse technical knowledge and expertise to meet customer needs and address social issues.
6. *Research:* Ability to formulate and answer empirical and theoretical questions through participation in undergraduate research projects for interested and qualified students.
7. *Leadership:* Awareness of the need for engineering leaders both within the profession and the larger community, as well as some preparation to assume those leadership roles.
8. *Communication Skills:* Ability to communicate effectively both through oral presentations and the written word.
9. *Interpersonal Skills:* Ability to interact professionally with others in the workplace, to engage effectively in teamwork, and to function productively on multidisciplinary group projects.
10. *Engineering Ethics:* Understanding of the engineer's responsibilities to employers, society, and their fellow engineers as well as an ability to recognize potential and actual ethical problems, analyze critically those situations, and formulate sound ethical decisions.
11. *Engineering & Society:* Understanding of the symbiotic relationship between engineering and society – specifically, how engineering artifacts are shaped by and incorporate human values as well as the ways in which engineering solutions impact society – and the larger social obligations this entails for engineers.
12. *Life-long Learning:* Skills necessary to engage in life-long learning and an understanding of the need to continually exploit those skills in refining and updating one's knowledge base.

Requirements for Major

Requirements for the Electrical Engineering major include thorough preparation in mathematics, physics, chemistry, and engineering science. Elective courses must include both Electrical Engineering courses and technical courses outside the department. **Students must earn a grade of 'C' or higher in all engineering, mathematics, and science courses as well as the prerequisites for these courses.** A sample program is shown below.

	Semester	
	I	II
Freshman Year		
CHEM 135 General Chemistry for Engineers	3	
PHYS 161 General Physics		3
MATH 140, 141 Calculus I, II	4	4
ENES 100 Intro. To Engineering Design	3	
ENEE 114 Programming Concepts for Engineers		4
CORE General Education*	3	3
Total	13	14

Sophomore Year		
MATH 241 Calculus III	4	
MATH 246 Differential Equations		3
PHYS 260 & 261 General Physics II	4	
PHYS 270 & 271 General Physics III		4
ENEE 241 Numerical Techniques in Engineering	3	
ENEE 244 Digital Logic Design	3	
ENEE 204 Basic Circuit Theory		3
ENEE 206 Digital Circuits Lab		2
CORE General Education*	3	3
Total	17	15

Junior Year		
MATH 4xx** Advanced Elective Math		3
ENEE 303 Analog and Digital Electronics	3	
ENEE 307 Electronics Circuits Design Lab	2	
ENEE 313 Intro. to Device Physics	3	
ENEE 322 Signal and System Theory	3	
ENEE 324 Engineering Probability		3
ENEE 350 Computer Organization		3
ENEE 380 Electromagnetic Theory	3	
ENEE 381 Electromagnetic Wave Program		3
CORE General Education*		3
Total	14	15

Senior Year		
Technical Electives NON-EE Technical Electives	3	6
Technical Electives EE Electives	7	6
ENGL 393 Junior English	3	
CORE General Education*	3	3
Total	16	15

* **Note:** Schedule assumes one CORE class satisfies the CORE Cultural Diversity requirement.

**Must come from list of courses approved for the Non-EE Technical Elective requirement.

Electrical Engineering Majors

New EE Technical Elective Requirements*

Effective Spring 2001, all BSEE graduates must distribute their 13 credits of EE technical electives among the following course categories:

Category A	Advanced Theory and Applications: minimum of 3 credits
Category B	Advanced Laboratory: minimum of 2 credits
Category C	Capstone Design: minimum of 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 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. 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 and Associate Director of Undergraduate Studies, faculty in Electrical and Computer Engineering function as undergraduate advisors. 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.

Cooperative Education Program

Participation in the Cooperative Education Program is encouraged. See A. James Clark School of Engineering entry in chapter 6 for details.

Departmental Honors

The Electrical and Computer Engineering Honors Program is intended to provide a more challenging and rewarding undergraduate experience for students pursuing the baccalaureate in Electrical or Computer Engineering. The program requires students to complete honors versions of four junior level electrical engineering courses and an honors project during the senior year. Students completing all program requirements with a 'B' average (3.0 on a 4.0 scale) and a cumulative GPA of 3.0 for all undergraduate work will have their participation noted on their B.S. diploma.

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.

Job Opportunities

Electrical engineers were primarily responsible for the recent revolutions in the music and telecommunications industries. They remain at the forefront of cutting edge developments and innovations in nanotechnology, robotics, and other technologies. Electrical engineers also have wide ranging employment opportunities in other fields including electronics, microelectronics, communications and signal processing, power systems, electrophysics, computer architecture, circuits, antennas, and control systems. Specific jobs include developing fiber optic technology, lasers for biomedical applications, software for robots, electronic weapons systems, advanced wireless networks, and neuron-like sensors for various applications.

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

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 Glenn L. Martin Hall. Equally active is the chapter of Eta Kappa Nu, the nationwide Electrical Engineering honorary society. Information on eligibility can be obtained in the HKN lounge, 1154 Engineering Laboratory Building.

Course code: ENEE

ENGINEERING, BACHELOR OF SCIENCE

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 Advisor" 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 Office of Undergraduate Advising and Academic Support 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 advisors 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 a 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 has the following objectives:

- To provide the basic professional education and flexibility to tailor ABET accredited engineering program (Engineering Option) to those students who plan to have a career in or continue their engineering studies at the graduate level in one of the many interdisciplinary fields of engineering such as biotechnology, nanotechnology, environmental, robotics, systems engineering, and many others.
- To prepare students who do not wish to follow a professional career in a traditional engineering field but rather plan to use the breadth and depth of their engineering education as preparation for entry into post-baccalaureate study or careers in such fields as medicine, law, or business administration.
- To prepare those students who do not intend to pursue a career in a traditional engineering field but rather want to use a more broad engineering curriculum in order to gain a professional auxiliary or management position in an engineering-related industry.
- The program is designed to give the student maximum flexibility to design an academic program which is specific to the student's career goals. To accomplish these objectives, the program has two optional paths: the Engineering Option and the 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.

114 English Language and Literature

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 either option of 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 ⁴	3
Engineering Elective ^{2,4}	3
Primary Field ^{1,7}	24
Secondary Field ^{1,7}	12
Major Field or related electives ⁴	3
Approved electives ^{3,4}	6
Total credits	51

Applied Science Option

Mathematics/Physical Science Requirements ⁴	3
Engineering Sciences ^{2,4}	3
Primary Field ¹	18
Secondary Field ¹	12
Major Field or related electives ⁴	3
Approved electives ^{4,6}	9
Senior research project ⁵	3
Total credits	51

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 and mechanical engineering. All engineering fields of concentration may be used as a secondary field within the engineering option.

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

²Engineering 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.

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

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

⁵Students 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.

⁶In 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.

For the Engineering Option, the student's program must fulfill all ABET requirements, including sufficient credits in mathematics and basic sciences. Additionally, the program must contain the proper design component, as specified by ABET, which is, at a minimum, the capstone design course in either the student's primary or secondary engineering field. It is the responsibility of the student and his/her advisors to ensure that the requirements are satisfied by the appropriate selection of courses in the primary and secondary fields of concentration.

ENGLISH LANGUAGE AND LITERATURE (ENGL)

College of Arts and Humanities

3101 Susquehanna Hall (SQH), 301-405-3809

www.english.umd.edu

Undergraduate Advisors: 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*, Leinwand, Leonardi, Levine, Mack, Norman, Pearson, C. Peterson, Plumly††, Smith, Washington, Wyatt* Associate Professors: Bauer, Cate, Chuh, Cohen, Coleman, G. Hamilton, Kleine, Lindemann, Logan, Loizeaux, Marcuse, Moser, Norman, Ray, Richardson, Rosenthal, Van Egmond, Wang

Assistant Professors: Arnold, Israel, Jarrett, Jellen, Kirschenbaum, Mallios, Rudy, Weiner

Lecturers: Miller, Ryan

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

††Distinguished University Professor

*Distinguished Scholar Teacher

Advising

Advising is available throughout the year in 2115 Susquehanna Hall. Departmental advising is mandatory for all majors each semester. Students should check Testudo for their registration date and schedule an advising appointment at least one week in advance. Advising appointments can be made by calling 301-405-3825 or by visiting the English Undergraduate Office in 2115 Susquehanna Hall.

The Major

The English major has three parts: English 301, Group I Requirements, and Group II Requirements. The **Group I Requirements** assure that students have a broad foundation in literary history and become aware of the questions an inquiring reader might ask of a text. The **Group II Requirements** offer students the opportunity to explore in greater depth both literary periods and literary themes that cross periods and to develop skills in reading, criticism, writing, and research.

1. The English major requires 36 credits beyond the university Fundamental Studies requirements in ENGL 101 and ENGL 391-95. At least 30 of the 36 credits for the major must be taken at the 300- or 400- level, and at least 12 credits must be at the 400-level.
2. A "C" or better is required in each of the courses making up the 36 credits of the major.
3. Three credits of ENGL 388 (Internship courses) may be included in the 36 credits.
4. Only 6 credits of ENGL 429 (Independent Study) may be included in the 36 credits.
5. Only 9 credits of ENGL 379 (Special Topics courses) may be included in the 36 credits.
6. Only 9 credits of ENGL 428 (seminars) may be included in the 36 credits.

The English Major Requires 36-credits, Distributed As Follows:

ENGLISH 301: Critical Methods in the Study of Literature (3 credits)

English Majors must take ENGL 301 before they take other 300- or 400-level English courses. We recommend it be taken during the sophomore year. In special cases, students may be permitted to take ENGL 301 while they are taking their first upper level course.

GROUP I REQUIREMENTS (9 credits)

To be taken at the 200- or 300-level.

1. One course (3 credits) in literary and cultural history.
2. One course (3 credits) in literary, linguistic, or rhetorical analysis.
3. One course (3 credits) in the literature of African-Americans, peoples of color, women, and/or lesbians, gays, and bisexuals.

GROUP II REQUIREMENTS * (24 credits)

To be taken at the 300- and 400-level

1. Two courses (6 credits) focused on writing before 1800.
2. One course (3 credits) in Modern British, Anglophone, and/or Postcolonial Writing (after 1800).
3. One course (3 credits) in American, African American, and/or U.S. Ethnic Writing.

4. Four English focus courses (12 credits total), which may follow a designated pathway if the student desires. Students may also count one 300- or 400-level literature course in a literary tradition other than English, either in the original language or in translation, as a Group II elective.

*At least 12 credits must be at the 400-level. No more than 6 credits of 200-level courses may be applied toward the major and can only be used to satisfy Group I requirements.

The Minor

The English minor has three parts: English 301, Group I courses, and Group II courses. The Group I courses assure that students acquire a broad foundation in literary history and critical strategies. The Group II courses offer students the opportunity to explore in greater depth literary periods and literary themes that cross periods. In these courses, students will develop skills in reading, criticism, writing, and research.

The English Minor Requires 21 Credits Distributed As Follows:

ENGLISH 301: Critical Methods in the Study of Literature (3 credits)

English minors must take ENGL 301 before they take other 300- or 400-level English courses. We strongly recommend that students take ENGL 301 during the sophomore year.

GROUP I COURSES (6 credits)

To be taken at the 200- or 300-level

English minors must take two courses from two different categories of the Group 1 listings (6 credits). These courses will be taken at the 200- or 300-level. The three categories in Group 1 are:

1. One course (3 credits) in literary and cultural history.
2. One course (3 credits) literary, linguistic, or rhetorical analysis.
3. One course (3 credits) in the Literature of African Americans, peoples of color, women, and/or lesbians, gays, and bisexuals.

GROUP II COURSES* (12 credits)

To be taken at the 300- and 400-level

English minors must take four courses (12 credits) from the Group 2 listings. At least two of these courses must be taken at the 400 level. These four courses should be distributed in the following ways:

1. Two courses (6 credits) on writing before 1800.
2. One course (3 credits) in Modern British, Anglophone, and/or Postcolonial writing (after 1800).
3. One course (3 credits) in American, African American, and/or U.S. Ethnic writing.

*One (and only one) Group II distributional requirement may be satisfied with any English course at the 300 or 400 level, other than ENGL 386 and ENGL 388.

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 advisor 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.

ENTOMOLOGY (ENTM)

College of Chemical and Life Sciences

4112 Plant Sciences Bldg., 301-405-3911
www.entm.umd.edu

Professor and Chair: Mitter

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

Associate Professors: Armstrong, Hawthorne, Lamp, Nelson, Pick, Shultz

Assistant Professors: Neel, Shrewsbury

Instructor: Kent

Professors Emeriti: Bickley, Davidson, Harrison, Hellman, Jones, Linduska,

Menzer, Messersmith, Steinhauer, Wood

Director of Graduate Studies: Hawthorne

Director of Undergraduate Studies: Kent

The Department of Entomology participates in teaching and advising in the interdepartmental undergraduate Biological Sciences Program (see separate listing). Faculty members pursue research ranging from molecular to ecosystem levels of organization in insects, and the organisms with which insects interact.

The Major

Undergraduate students interested in Entomology should declare the General Biology specialization within the Biological Sciences Program (see separate listing). Students should also contact the Entomology Director of Undergraduate Studies for information on pursuing a career in Entomology.

Requirements for Specialization

See the Biological Sciences Program listing in this catalog, or contact the Entomology Director of Undergraduate Studies for the General Biology requirements.

Advising

Advising is mandatory in the Biological Sciences Program. The Department of Entomology faculty coordinate and advise students in the General Biology (GENB) specialization. Contact the Department of Entomology for information about advising or to schedule an appointment with the Entomology Director of Undergraduate Studies. For advising on other Biological Sciences Program specializations, see the Biological Sciences Program listing in this catalog.

Research Experience

Students in the Biological Sciences Program can engage in research with Entomology faculty either in departmental or off-campus facilities. Contact the Entomology Director of Undergraduate Studies for more information.

Honors

The Entomology Honors Program provides the opportunity for highly motivated and academically qualified undergraduates to engage in original, independent research under the guidance of an Entomology faculty mentor. The program is open to all Biological Science Program students who have (1) junior standing (including at least twelve credits within the major), (2) a minimum overall GPA and major courses GPA of 3.2, and (3) a Department of Entomology faculty member who has agreed to serve as their mentor. Contact the Entomology Honors Director, Dr. William Lamp (lamp@umd.edu) for more information. Participants in the Entomology Honors Program are eligible for the Ernest N. Cory Undergraduate Scholarship.

Course Code: ENTM

ENVIRONMENTAL SCIENCE AND POLICY PROGRAM (ENSP)

0102 Symons Hall, 301-405-8571

E-mail: bj5@umail.umd.edu or jbrown@deans.umd.edu

www.ensp.umd.edu

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 Chemical and Life Sciences). There are 11 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 advisor 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 advisors.

116 Family Studies

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. Some areas of concentration require an internship, and students will be encouraged to pursue practical work, study abroad, and volunteer opportunities as part of their undergraduate programs.

Requirements for Major

ENSP CORE

1. Two introductory courses and three credits each semester, emphasizing Environmental Science in ENSP 101 and Environmental Policy in ENSP 102.
2. At least one course each from five of the following six groups: a) Biology (BSCI 106); b) Chemistry (CHEM 131/132); c) Earth Sciences GEOL 120/110, GEOL 100/110, GEOG 201/211, NRSC 200, AOSC 200); d) Economics (AREC 240, ECON 200); e) Geography (GEOG 100, GEOG 170, GEOG 202); f) Government & Politics (GVPT 273, AREC 332).
3. One semester of Calculus (MATH 140 or MATH 220)
4. One semester of Statistics (BIOM 301, ECON 321, PSYC 200, SOCY 201, STAT 400)
5. The Capstone course (ENSP 400 in the senior year)

Areas of Concentration

Biodiversity and Conservation Biology; Earth Surface Processes; Environment and Agriculture; Environmental Economics; Environmental Politics and Policy; Environmental Restoration and Management; Land Use; 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

Students who entered the Environmental Science and Policy Program in spring 2002, and thereafter, are required to earn grades of C or higher in all courses taken within the ENSP core, 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

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

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, ethnic families,

family crises, family violence, family policy, legal problems, family economics, family finance and human services.

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). A grade of C or better is required. 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

Professor and Chair: DiMarzo
Associate Chair: Milke
Professors: Brannigan, Quintiere
Associate Professors: Milke, Mowrer, Trouve
Assistant Professors: Marshall, Sunderland
Lecturers (part-time): Gagnon, Simone
Emeriti: Bryan, Spivack
Adjunct Professors: Roby, Toren

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 educational objectives of the undergraduate program in Fire Protection Engineering are to produce graduates who:

1. have the technical knowledge and skills needed to practice fire protection engineering in a variety of modern professional settings;
2. have the basic competencies needed to pursue advanced studies in fire protection engineering and related fields;
3. have the ability to understand and communicate the societal, environmental, economic and safety implications of engineering decisions;
4. are prepared to attain professional certification and licensure; and
5. appreciate the need to maintain continual professional competency and to practice ethically.

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		
Total	13	16

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 260, 270 General Physics II, III	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
Total	17	16

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
Total	16	16

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
Total	15	12
Total Credit Hours		122

*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, 3rd floor of J.M. Patterson.

Fieldwork and Internship Opportunities

Part-time and summer professional experience opportunities and paid internship information is available in the department Office, 3rd floor, J.M. Patterson. See your advisor or the Undergraduate Chair: 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.

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, 3rd floor, J.M. Patterson.

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)

For more information, consult School of Languages, Literatures, and Cultures elsewhere in this chapter.

118 Geography

GEOGRAPHY (GEOG)

College of Behavioral and Social Sciences

2181 LeFrak Hall, 301-405-4050

www.geog.umd.edu

Chair: Townshend

Associate Chair: Cirrincione

Professors: DeFries* (ESSIC), Dubayah, Goward, Justice, Kasischke, Kearney, Prince, Townshend

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

Assistant Professors: Dibble, Kleidon, Zhou

Lecturers: Eney, Kinerney, Zlatic

Professors Emeritus: Harper, Thompson, Wiedel

Adjunct Faculty: Althausen, Goetz, Izzauralde, Morissette, Rosenberg, 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 advisor. See Advising Office, LeFrak 2108, 301-405-8085, e-mail geog-advise@umd.edu, web page: www.geog.umd.edu. 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:

	Semester Credit Hours
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 306)	3
Total	35

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

	Semester Credit Hours
Freshman Year	
ENGL 101 Introduction to Writing	3
MATH 110 Elementary Mathematical Models or MATH 115 Precalculus	3
University CORE Distributive Studies (To be chosen from the three categories of Humanities-Arts, Math-Sciences, and Social Sciences)	24
Sophomore Year	
University CORE Distributive Studies (To be chosen from Math-Sciences lecture-laboratory courses)	4
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 306)	3
Electives	15
Junior Year	
ENGL 391	3
CORE Advanced Studies	3
Advanced Human Geography	3
Advanced Physical Geography	3
Advanced Technique Geography	3
Geography Upper-Level Elective	3
Electives	12
Senior Year	
Geography Upper-Level Electives	12
Electives	18
Total	120

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 advisor.

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.

Minor

Minor in Geographic Information Science (GIS)

Total of 15/16 credit hours. See undergraduate advising office for details, LeFrak Hall 2108, 301-405-4073. Choose GEOG 201/211 or GEOG 202 (3/4 credits). Required: GEOG 398Q, GEOG 371, GEOG 372, GEOG 373 (12 credits).

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 advisor 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 advisor.

Student Organizations

Gamma Theta Upsilon, the geography undergraduate organization, operates a program of student-sponsored talks and field trips.

Course Code: GEOG

GEOLOGY (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 (Emeritus), Rudnick, Walker, Wylie†

Associate Professors: Kaufman, McDonough, Prestegaard, Stifel (Emeritus)

Assistant Professor: Farquhar

Adjunct Professor: Zen

Assistant Research Scientists: Piccoli, Puchtel

Lecturers: Holtz, Merck, Peamston, Penniston-Dorland

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 advisor. 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 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
One of the following:	
GEOL 444 Low Temperature Geochemistry	4
GEOL 445 High Temperature Geochemistry	
One of the following:	
GEOL 446 Geophysics	3
GEOL 472 Tectonics	
GEOL 451 Groundwater	3
GEOL 423 Optical Mineralogy	3
GEOL 443 Petrology	4
GEOL 490 Field Camp	6
	49

120 Geology

Supporting Courses

CHEM 135 General Chemistry for Engineers and CHEM 136 General Chemistry for Engineers Laboratory	4
MATH 140 Calculus I	4
MATH 141 Calculus II	4
PHYS 141 General Physics	4
One of the following	
PHYS 142 General Physics	
BIOM 301 Introduction to Biometrics	
Any of GEOL 444, 445, 446 or 472 not already completed to meet the requirements above or any other 300 or 400 level Geology course not listed.	
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. The department 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.

	Semester Credit Hours
CORE Program Requirements**	30
**excluding mathematics, science and one capstone requirement	

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 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 High Temperature Geochemistry	4
GEOL 451 Groundwater	3
GEOL 423 Optical Mineralogy	3
GEOL 443 Petrology	4
Credit hours Geology requirement	41-43

Supporting Courses

CHEM 135 General Chemistry for Engineers and CHEM 136 General Chemistry for Engineers Laboratory	4
AOSC 200 Weather and Climate	3
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 Courses

6 credits chosen from the following:

EDPL 301 Foundations of Education	3
or 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.

Minors

An undergraduate Minor recognizes concentrated study in a designated field in the College Of Computer, Mathematical, and Physical Sciences. The award of a Minor will be noted on the student's transcript at the time of graduation.

These minors 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 minor. See www.geol.umd.edu for more information.

Minor in Surficial Geology

Required: GEOL 100/110 (Physical Geology/Lab) or GEOL 120/110 (Environmental Geology/Lab), GEOL 123 Global Climate Change), GEOL 340 (Geomorphology), Plus two of: GEOL 342 (Sedimentation and Stratigraphy), GEOL 451 (Groundwater), GEOL 452 (Watershed and Wetland Hydrology), GEOL 331 (Principles of Paleontology).

Minor in Earth Material Properties

Required: GEOL 100/110 (Physical Geology/Lab) or GEOL 120/110 (Environmental Geology/Lab), GEOL 322 (Mineralogy) Plus two of: GEOL 341 (Structural Geology), GEOL 423 (Optical Mineralogy), GEOL 443 (Petrology), GEOL 445 (High Temperature Geochemistry).

Minor in Earth History

Required: GEOL 100/110 (Physical Geology/Lab) or GEOL 120/110 (Environmental Geology/Lab), GEOL 102 (Historical Geology) Plus three of: GEOL 331 (Principles of Paleontology), GEOL 341 (Structural Geology), GEOL 342 Sedimentation and Stratigraphy), GEOL 436 (Biogeochemistry).

Minor in Hydrology

Required: GEOL 100/110 (Physical Geology/Lab) or GEOL 120/110 (Environmental Geology/Lab), GEOL 322 (Mineralogy), GEOL 342 (Sedimentation and Stratigraphy); Plus two of: GEOL 436 (Biogeochemistry), GEOL 444 (Low Temperature Geochemistry), GEOL 451 (Groundwater), GEOL 452 (Watershed and Wetland hydrology).

All Geology minors are an appropriate disciplinary combination with Astronomy, Computer Science, Mathematics, or Physics majors within CMPS. The minors are also appropriate for majors outside the college with appropriate matches including, but not limited to:

Geography/Remote Sensing (Surficial Geology)
Engineering and Material Sciences (Earth Material Properties)
Evolutionary Biology and Physical Anthropology (Earth History)
Biology, Biological Diversity, and ecology (Earth History, Hydrology)

Advising

The Geology Undergraduate Studies Director serves as the advisor for the geology majors, 1119 Geology Building, 301-405-4379. Students who have been away more than two years may find that due to curriculum changes the courses they have taken may no longer be adequate preparation for the courses required to complete the major. Students in this situation must meet with the Undergraduate Studies Director to make appropriate plans.

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,
 - 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

GERMANIC STUDIES (GERM)

For more information, consult School of Languages, Literatures, and Cultures elsewhere in this chapter.

GOVERNMENT AND POLITICS (GVPT)**College of Behavioral and Social Sciences**

3140 Tydings Hall, 301-405-4156

www.bsos.umd.edu/gvpt

Professor and Chair: Lichbach

Professors: Alford†, Alperovitz, Barber, Butterworth†, Elkin, Franda, Gimpel, Glass†, Graber, Heisler, Herronson†, Lichbach, Oppenheimer†, Pearson, Pirages, Questert†, Telhami, Tismaneanu†, Uslaner, Walters*, (African American Studies), Wilkenfeld, Williams, Wilson* (JM Burns Academy of Leadership)

Associate Professors: Conca, Davenport, Haufler, Kaminski, Lalman, Layman, Lee, McIntosh, Morris, Schreurs, Soltan, Swistak

Assistant Professors: Grob, Kastner, Kaufmann, Kim, Schwedler

Instructor: 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 or GVPT 171, and GVPT 241.

122 Health

In addition, all majors must complete ECON 200, MATH 111, 140, 200 or STAT 100 which includes quantitative and foreign language 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 six 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, 1147 Tydings Hall. Walk-in schedules are posted on-line at www.bsos.umd.edu/GVPT/undergraduate.

Course Code: GVPT

HEALTH

See Public and Community Health later in this chapter.

HEARING AND SPEECH SCIENCES (HESP)

College of Behavioral and Social Sciences

0100 Lefrak Hall, 301-405-4214

www.bsos.umd.edu/hesp/

Professor and Chair: Ratner

Professors: Gordon-Salant, McCall (Emeritus), Yeni-Komshian (Emerita)

Associate Professors: Roth

Assistant Professors: Chatterjee, Fitzgerald, Newman, Shah, Tian

Instructors: Antonisse, Bonelli, Brewer, Davis, Fitzgibbons, Hakim, Handy, McCabe, Nagra, Oberzut, Palmer, Park, Perloth, Samlan, Sampugnaro, Sherlock, Sisskin, Skinker, Sonies, Worthington, Zalewski

Affiliate Professor: Stone

Adjunct Associate Professor: Chi-Fishman

Adjunct Professor: Drayna, Gaillard, 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 0100 Lefrak or on the departmental website at 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 or	3
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 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.

The Minor

Requirements for the HESP minor include the following coursework:

HESP 202 (Introduction to Hearing and Speech Sciences)
HESP 300 (Introduction to Psycholinguistics)
HESP 400 (Child Language Acquisition)
HESP 403 (Phonetics)
HESP 407 (Hearing Science)

PLUS 2 courses in one of the two elective areas:

Elective option 1 (Speech-Language Pathology Focus)
HESP 305 (Anatomy/Physiology of the Speech Mechanism) and
HESP 402, 404 or 406 (Speech Pathology I, II or III)

Elective option 2 (Audiology focus)

HESP 311 (Anatomy/Physiology/Pathology of the Auditory Mechanism) and
HESP 411 (Introduction to Audiology)

TOTAL CREDITS: 21

All classes must be completed with a grade of C or better; as with HESP majors, students must obtain a grade of C or better in a class order to enroll in any courses that require that class as a pre-requisite.

This course sequence acquaints the student with the primary basic science background in the speech, language and hearing sciences, and permits the student to select two courses in the specific professional areas of speech, language or hearing based on the student's primary interest area.

This minor is designed for the student in other majors (such as Psychology, Education, Linguistics, FOLA, etc.) who may have plans to attend graduate school in the fields of Speech-Language Pathology or Audiology. These courses are widely viewed as pre-requisite for admission to such programs and constitute a proportion (but not the full extent) of coursework required for eventual post M.A. or post-Au.D. certification by the American Speech-Language Hearing Association as either a Speech-Language Pathologist or Audiologist. Because both graduate programs and ASHA may require additional coursework, the student pursuing the HESP minor is strongly encouraged to meet with a HESP academic advisor to ensure that eventual educational goals are properly addressed. The HESP minor does not qualify an individual to work professionally as a Speech-Language Pathologist or Audiologist, but does provide a proportion of the coursework required to practice in the State of Maryland as a Speech-Language Pathology Assistant.

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.

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/. Advising appointments may be made at www.bsos.umd.edu/hesp/hespaptcalendar/

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.history.umd.edu

Professor and Chair: Gerstle

Distinguished University Professors: Berlin, Brush, Gilbert

Professors: Belz, Eckstein, Friedel, Gullickson, Harris, Henretta†, Herf, Holum, Lampe, Lapin, Michel, Olson, Price, Rozenblit, Sutherland, Vaughan, Weinstein, Zhang

Associate Professors: Barkley-Brown, Cooperman, M. David-Fox, Gao, Grimsted, Landau, Lyons, Mayo, Moss, Muncy, Ridgway, Rowland, Sicilia, Sumida, Williams, Zilfi

Assistant Professors: Bradbury, K. David-Fox, Giovacchini, Gordon, Mar, Zeller
†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 advisors assist each major in planning a curriculum to meet his or her personal interests. We encourage students to meet with an advisor, 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 Advisor'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: Africa, Britain and Western Europe, East Asia, Eastern Europe and Russia, Latin and South America, Middle East, United States;
 - b. Chronological periods; Ancient, Medieval and Early Modern Europe, 20th Century World;
 - c. Themes: African-American, Economic and Business, Jewish, Military, Religious, Science and Technology, Social and Cultural Women and Gender.

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

Chair: Wigfield

Assistant Director/Institute for Child Study: Battle

Professors: Alexander†, Fox†, Guthrie, Killen, Rubin, Torney-Purta, Wentzel, Wigfield†

Associate Professors: Azevedo, Flatter, Jones-Harden, Klein, Marcus, Robertson-Tchabo

Assistant Professors: Cabrera, Parault, Wang

Emeriti: Bennett, Dittman†, Eliot, Gardner, Goering, Hatfield, Huebner, Matteson, Tyler

†Distinguished Scholar Teacher

124 Individual Studies Program

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 from other departments across campus who are seeking an education minor or who desire to work with children and adolescents in school settings. These courses focus on child and adolescent development, language acquisition, cognition, motivation, and reading. In addition, the department offers undergraduate courses that help students meet CORE requirements and other degree requirements.

The Institute for Child Study provides 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 Numbers and Operations (MATH 212), and Elements of Geometry and Measurement (MATH 213) with a minimum cumulative GPA in these four courses of 2.70
- (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, ECON, GEOG, GVPT, HIST, 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 212 and MATH 213	6
Creative Art: One of the following: KNES 181, 182, 183, 421, THET 120, EDCI 301, ARTT 100 or 110, MUED 155	2-3
EDHD 220 -Exploring Teaching in ECE	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. Teacher candidates must obtain satisfactory evaluations on the College of Education Technical Standards. 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 425 Language Development and Reading Acquisition	3
EDHD 419A Human Development and Learning	3
EDSP 470 Introduction to Special Education	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
EDHD 415 Social Competence in Young Children	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

INDIVIDUAL STUDIES PROGRAM (IVSP)

1117 Hornbake Library, 301-314-9962
IVSP Coordinator: Jeff Kniple
www.ivsp.umd.edu/

Subject to a rigorous proposal process, the Individual Studies Program (IVSP) enables UM students to design unique majors when their educational goals cannot be reasonably achieved within an existing departmental curriculum. The Individual Studies Program leads to a Bachelor of Arts or Bachelor of Science degree. IVSP degree programs focus on academic and intellectual growth through interdisciplinary study. Training for a chosen profession is never the purpose of IVSP.

For more information, see Office of Undergraduate Studies section in Chapter 6.

INFORMATION SYSTEMS: SPECIALIZATION BUSINESS

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

JEWISH STUDIES PROGRAM (JWST)

College of Arts and Humanities

0112 Holzapfel Hall, 301-405-4975
www.jewishstudies.umd.edu

Director: Hayim Lapin
Professors: Berlin, Rozenblit
Associate Professors: Cooperman, Lapin, Manekin
Assistant Professors: Jelen, Zakim
Instructors: Gonen, Levy

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; JWST 272 is recommended); 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 advisor.

Minor in Jewish Studies

Requirements: 15 credits towards the Minor in Jewish Studies are to be distributed as follows:

- History: 3 credits
- Literature: 3 credits
- Thought, religion, or cultural studies: 3 credits
- Electives: 6 credits

A minimum of 9 credits must be at the upper level.

All credits must be earned with a grade of "C" or above.

A list of qualifying courses in each category is available from the Director of the JWST program.

Up to 3 credits of lower-level Hebrew or Yiddish language study may be credited toward the Minor. In exceptional cases, students may petition to have other languages included.

Restrictions:

- Students enrolled in the Jewish Studies Major are not eligible to enroll in the Minor.

- At least six credits of upper-level credit must be taken at the University of Maryland,
- No more than six credits may be taken at an institution other than Maryland.
- In keeping with University policy, no more than six credits may be also be applied to a major.

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

Professor and Chair: Clark
Associate Chair: Farmer
Professors: Clark, Ennis, Hagberg, Hatfield, Hurley, Iso-Ahola
Associate Professors: Andrews, Brown, Chen, Contreras-Vidal, Jeka, McDaniel, Rogers, Rohm-Young
Assistant Professors: Roth, Shim, Silk
Instructors: Brown, Metcalfe, Montfort, Schultz, Scott
Emeriti: Clarke, Dotson, Franks, Hult, Humphrey, Husman, Kelley, Phillips, Steel, Wrenn

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 on the web at www.hhp/umd.edu/KNES). Both programs require a grade of C or better in all required course-work. Departmental contacts are Mr. Joshua Montfort for Physical Education (301-405-2502, jmontfor@umd.edu) or Dr. Marvin Scott (301-405-2480, mwscott@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.

126 Landscape Architecture

Physical Education Degree Requirements

University Core (not included elsewhere*)	24
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)	1
Elective	

Minimum total semester hours for this program is 120 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 (Currently 2.50). 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*)	27
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)	33

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 80 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. David Andrews, Honors Program Coordinator, at 301-405-2474 or dla@umd.edu.

Minor

Sport Commerce and Culture

The minor in Sport Commerce and Culture provides students with a unique opportunity to study the structure and experience of contemporary sport culture from an interdisciplinary perspective rooted in theories and methods largely – but not exclusively – drawn from anthropology, cultural studies, economics, gender studies, history, media and communication studies, psychology, race and ethnic studies, sociology, and urban studies. The minor requires 18 credits:

Required courses: Both the following courses (6 credits)

KNES 2871 Sport in American Society (3)
KNES 2932 History of Sport in America (3)

N.B. These courses fulfill CORE SB/D1 and SH2 requirements

Elective Courses: Any four of the following 3-credit courses (12 credits)

KNES 240 Exploring Cultural Diversity Through Movement	3
KNES 350 The Psychology of Sports	3
KNES 351 Contemporary Issues in American Sport	3
KNES 355 Sport Management	3
KNES 357 Sport and Culture in the Global Marketplace	3
KNES 451 Children and Sport: A Psychosocial Perspective	3
KNES 483 Sport Marketing and Media	3
KNES 484 Sporting Hollywood	3
KNES 485 Sport and Globalization	3
KNES 486 Politics and Economics of Organized Contemporary Sport	3

Please Note:

- Not all elective courses are offered every year.
- Temporary courses may be added to this list dependent on the Minor advisor's approval
- Relevant courses from other departments may be added to the list dependent on the Minor advisor's approval

Course Code: KNES

LANDSCAPE ARCHITECTURE (LARC)

College of Agriculture and Natural Resources

2139 Plant Sciences Building, 301-405-4359
Program Coordinator: Jack Sullivan: jack@umd.edu
Academic Program Specialist: Mary Jo Dosh: mdosh@umd.edu
www.larc.umd.edu/

Professor and Chair: F. Coale
Associate Professor and Coordinator: J.B. Sullivan
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 Agricultural Sciences. The third major leads to a Bachelor of Landscape Architecture (B.L.A.) degree. For additional information on General Agricultural Sciences and Natural Resource Sciences, see the entries for those programs elsewhere in this chapter.

The landscape architecture curriculum is a four-year professional program. The program is 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 112 or 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 Academic Review Course Requirements (LARC 120, 140, 141, 160 and MATH 112 or 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.)

	Semester Credit Hours
ENGL 393 Technical Writing	3
GEOG 340 Geomorphology or GEOG 372 Remote Sensing or NRSC 444 Remote Sensing of Agriculture and Natural Resources	3
LARC 120 Digital Fundamentals	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 GIS and Regional Design Studio	5
LARC 389 Internship in Landscape Architecture	3
LARC 420 Professional Practice	3
LARC 440 Urban Design Studio	5
LARC 450 Environmental Resources or LARC 451 Sustainable Communities	3
LARC 470 Landscape Architecture Seminar	3
LARC 471 Capstone/Community Design Studio	5
MATH 112 College Algebra with Applications and Trigonometry or MATH 115 Pre-calculus	3
NRSC 200 Fundamentals of Soil Science	4
PLSC 100 Introduction to Horticulture	4
PLSC 253 Woody Plants for Mid-Atlantic Landscapes I	3
PLSC 254 Woody Plants for Mid-Atlantic Landscapes II	3
Total Major Requirements	87
Additional CORE Program requirements	24
Electives	9
Total	120

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 chartered 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

LANGUAGES, LITERATURES AND CULTURES, SCHOOL OF (SLLC)

College of Arts and Humanities

1105 Jiménez Hall, 301-405-4025
www.languages.umd.edu

Director: Michael Long
Associate Director (Academic): Pierre Verdague
Associate Director (Administrative): Charlotte Groff Aldridge

The School of Languages, Literatures, and Cultures is the primary academic unit devoted to instruction and research in the world's languages, literatures, and cultures. It consists of the Departments of Asian and East European Languages and Cultures; French and Italian Languages and Literatures; Germanic Studies; and Spanish and Portuguese Languages and Literatures; and the Second Language Acquisition program. The School offers study abroad programs in many countries, both short and long-term. Its Language House, a residential immersion facility for approximately 100 students located in St. Mary's Hall, is one of the most successful living-learning programs on campus.

In addition, the FOLA (Foreign Language Acquisition) program offers individualized instruction in less commonly taught foreign languages. The FOLA program is designed to enable qualified students to acquire a speaking knowledge through a structured self-instructional sequence of exercises and tutorials. Recent language offerings have included: Armenian, Dutch, Hindi, Hungarian, Polish, Swahili, Tagalog, Turkish, Urdu and Vietnamese."

128 Languages, Literatures and Cultures, School of

ASIAN AND EAST EUROPEAN LANGUAGES AND CULTURES (AEEL)

2106 Jimenez Hall, 301-405-4239
www.languages.umd.edu/AsianEastEuropean

Professor and Chair: Ramsey
Professors: Brecht, Karimi
Associate Professors: Branner, Chin, Elgibali, Gor, Hitchcock, Kerkham, Lekic, Liu, Martin, Vetsukura, Yotsukura
Assistant Professors: Chao, Jones, Papazian, Zakim
Instructors: Levy, Miura, Yaginuma
Lecturers: Crawford, Gonen, Hijazeen, Inoue, Kashima, Kong, Krizi, Lee, Mohamed, Nabavi, Pelleg, Y. Ramsey, Shayesteh, Yamakita, Zhu

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.

The Chinese Major

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 and	3
HIST 481 A History of Modern China or	3
HIST 485 History of Chinese Communism	3
Option II:	
HIST 285 East Asian Civilization II and	3
HIST 480 History of Traditional China	3
Electives (300-level or above)	12

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 advisor.

Minor in Chinese Language

Minors in Chinese Language and Chinese Studies are available. Contact the department for requirements. Students who fulfill Minor requirements will receive a Minor on the official transcript.

The Japanese Major

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 and	3
HIST 483 History of Japan Since 1800	3
Option II:	
HIST 285 East Asian Civilization II and	3
HIST 482 History of Japan to 1800	3
Electives (300-level or above)	12

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 advisor.

Minors in Japanese

The Japanese Minor is a series of five courses to be chosen in consultation with a departmental advisor.

The Russian Major

The undergraduate major in Russian Language and Literature consists of 40 credits beyond the pre-requisite of Elementary Russian (Russian 101-102, or Russian 111-112-113-114 or equivalent). Many students pursue a double major or double degree in Russian and another discipline, such as international relations, business, history, economics, journalism, engineering, etc. Russian students have the opportunity to live in St. Mary's Language House, and the majority of majors participate in study abroad. Native or heritage speakers wishing to enroll in Russian courses or major in Russian should consult with the Undergraduate Advisor. Students interested in enrolling in a course that appears closed or that has a waitlist, are strongly encouraged to contact the faculty member or Undergraduate Advisor for Russian for permission to enroll.

Russian Course Requirements

RUSS 201 Intermediate Russian I	5
RUSS 202 Intermediate Russian II	5
RUSS 301 Advanced Russian I	3
RUSS 302 Advanced Russian II	3
One additional course at the 300-level	3
RUSS 401 Advanced Russian Composition	3
RUSS 402 Practicum in Written Russian	3
One additional course at the 400-level	3

Four electives (total of 12 credits) from departmental offerings, two of which must be 300- or 400-level courses taught in Russian. One supporting course outside the department (at the 300-level or above) may be counted toward the major with an advisor's prior approval. All courses counting toward the major must be passed with a "C" or better. Transfer credits (from study abroad or another US institution) may count toward the major with departmental approval.

Minor in Russian Studies

Students may complete a Minor in Russian Studies that consists of a minimum of 15 credits/five courses. A minimum of six credits must be earned from courses in Russian. A minimum of nine credits must be at the 300- or 400-level. Transfer credits (from study abroad or another US institution) may count toward the Minor with prior approval of the department. In most cases, a maximum of six transfer credits will be approved. All courses counting toward the minor must be passed with a "C" or better.

Other AEEL Language Programs

Arabic Language

While there is no Arabic major, 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. Three levels, elementary, intermediate, and advanced 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.

Korean Language

Students are able to study this language by pursuing either one of two tracks. The first consists of KORA 101, 102, 202, and 212 and is designed for students with no previous background in, or exposure to, Korean language and culture. The second track consists of KORA 211, 212, 311, and 312. 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.

The Korean Studies Minor

The Korean Studies Minor provides students with a basic knowledge of Korea and its language and culture. Five three-credit courses are required, and three of the five must be at the 300-level (or above). This minor is open to both heritage and non-heritage students alike. Students who fulfill Minor requirements will receive a Minor on the official transcript. Those interested should contact the faculty in the Korean Language Program for advisement.

Persian Language

While there is no Persian major, the Persian program offers language courses at the introductory, intermediate, and advanced levels, and literature courses at the 300 and 400 levels. A minor and a major in Persian Studies are in preparation.

FRENCH AND ITALIAN (FRIT)

3106C Jimenez Hall, 301-405-4024
www.languages.umd.edu/FrenchItalian

Professor and Chair: Brami
 Professors: Mossman, Verdaguer
 Associate Professors: Campagne, Falvo, Letzter, Scullen
 Assistant Professor: Eades
 Lecturers: Amodeo, Clough
 Emeriti: Fink, Hage, 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 supports multiple study abroad programs in France and Italy 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.

The undergraduate major in French consists of 36 hours of French courses above FREN 203. 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 Undergraduate Advisor as early as possible for proper planning.

Students must take language acquisition courses sequentially, i.e., 103, 203, 204, 250, 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.

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 Undergraduate Advisor.

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.

The Romance Languages Major

The Romance Languages Program is intended for students who wish to major in more than one Romance language. Either French or Italian, or both, may serve as components of this major.

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 advisor 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.

130 Languages, Literatures and Cultures, School of

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, 250, 301, 351, 352; 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.

Minors

Minor in French Studies

15 credit hours. Five courses in French from approved list of courses. Students who fulfill Minor requirements will receive a Minor on the official transcript.

Course Codes: FREN, ITAL

GERMANIC STUDIES (GERM)

3215 Jimenez Hall, 301-405-4091

www.languages.umd.edu/german

Professor and Acting Chair: Pfister

Professors: Beicken[†], Oster, Frederiksen[†]

Associate Professors: Strauch, Walker

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 German Language and Literature Major

The undergraduate major in German Language and Literature 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 concentrations are available in German language, German literature, Scandinavian studies, and Indo-European and Germanic philology. All majors must meet with a departmental advisor 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 advisor for more information.

Students must take language-acquisition courses sequentially, i.e., 101, 102, or 103, 201, 202, or 203. 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.

Minors

Minor in German Language, Literature, and Culture

15 credit hours from approved list of courses. Courses taken through Study Abroad programs may be applied. Contact the Director of Office of Undergraduate Studies for more information. Students who fulfill Minor requirements will receive a Minor on the official transcript.

Course Code: GERM

SPANISH AND PORTUGUESE (SPAP)

2215 Jimenez Hall, 301-405-6441

www.languages.umd.edu/SpanishPortuguese

Professor and Acting Chair: Cypess

Professor Emerita: Nemes

Professors: Aguilar-Mora, Cypess, Harrison, Pacheco^{††}, Sosnowski

Associate Professors: Benito-Vessels, Igel, Lavine, Merediz, Naharro-Calderón, Peres, Rodriguez

Assistant Professors: Lacorte, Sánchez

Instructors: Remson, Roman

^{††}Distinguished University Professor

The Spanish Language and Literature Major

Requirements for the Spanish Language and Literature Major includes 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.

Language and Literature Option

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 Option

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.

The Romance Languages Major

See description of the Romance Languages Major under **French** and **Italian**.

Minors

Minor 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 Office of Undergraduate Studies for more information.

Minor in Portuguese Languages and Cultures

15 credit hours. Free courses in Portuguese from approved list of courses. Contact the Director of Office of Undergraduate Studies for more information.

Minor in Spanish Language, Business, and Cultures

15 credit hours. Five courses from an approved list of courses.

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 two semesters of four credits each (103-203). The language requirement for the B.A. degree in the College of Arts and Humanities is satisfied by passing 203 or equivalent. Students who wish to enroll in Spanish 103 or 203 must present their high school transcript for proper placement. See the Schedule of Classes for further information.

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., 103, 203, 204, 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

LINGUISTICS (LING)

College of Arts and Humanities

1401 Marie Mount Hall, 301-405-7002

Professor and Chair: Hornstein
Distinguished University Professor: Lasnik
Professors: Pietroski, Uriagereka
Associate Professors: Idsardi, Lidz, Phillips, Poeppel, Resnik, Weinberg
Research Scientist: Zukowski
Senior Lecturers: Antonisse, Bleam
www.ling.umd.edu

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

Core required of all majors (15 credits): LING 240, 311, 321, two of six upper level courses (312, 322, 330, 410, 420, HESP403)

Grammars and Cognition Track (24 credits in addition to core)

In addition to core: PHIL 170 or 173 or 271; LING 350; PSYC 100; PSYC 341; two upper level LING electives; two electives in LING, PSYC, HESP, PHIL, or CMSC.

Language Track (24 credits in addition to core)

In addition to core: 15 credits of a single chosen language; 3 credits in structure or history of the language; two upper level LING electives.

There are no requirements for support courses for the Linguistics major.

A grade of at least 'C' is required in all major courses.

Minors

Minor in Linguistics

15 credit hours: 200, 240, 321, 311, one upper level linguistics elective.

All courses presented for the minor must be passed with a grade of 'C' or better.

Honors

Academically talented Linguistics majors with junior standing may petition to become honors candidates in Linguistics.

Course Code: LING

LETTERS AND SCIENCES (LTSC)

For information, see Office of Undergraduates Studies in Chapter 6.

132 Logistics, Business and Public Policy

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, 301-405-5207
www.mse.umd.edu

Chair: Briber

Professors: Al-Sheikhly, Armstrong* (Emeritus), Arsenault (Emeritus), Briber, Christou, Dieter* (Emeritus), Oehrlein, Roytburd, Rubloff, Salamanca-Riba, Smith (Emeritus), Wuttig
Associate Professors: Ankem, Lloyd, Martinez-Miranda, Phaneuf, Takeuchi
Assistant Professor: Cumings

Adjunct: Lawn

Affiliate Associate Professors: Anderle, Hathaway, Kofinas, Mohammad, Zachariah*

*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. 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.

Mission Statement

The mission of the Materials Science and Engineering Department at the University of Maryland is to provide a quality engineering education, research at the forefront of the field, and leadership to the Materials and Engineering communities. Our educational programs have the following objectives:

- Produce high quality graduates who will be successful in their chosen careers in industry, government or academia, in the State of Maryland, the nation and the world
- Teach our students to define and solve engineering and science problems in the field of Materials Science and Engineering
- Provide our students with the ability to relate basic physics, math and engineering principles to the field of materials science and engineering so they can function professionally as materials engineers and scientists
- Prepare our students to design and engineer materials and manufacturing systems for the next generation of products and deal effectively with the rapid pace of technological advances
- Continually improve our educational program, attract the best students and improve the visibility and stature of the program

These objectives will be accomplished by providing the following educational outcomes for students majoring in Materials Science and Engineering:

- A solid foundation in mathematics, physics, chemistry, and basic engineering sciences
- An integrated educational program emphasizing structure, properties, processing and performance of materials and the interrelations between them along with the design of materials systems, design of experiments and data interpretation
- An opportunity to develop in-depth knowledge in specific areas of materials science and engineering which include: design and applications of materials and manufacturing, materials science, organic materials, electrical and electronic materials or biomaterials
- The opportunity to work with faculty and industry on complex problems through projects, internships, and research and co-op experiences
- A culminating design experience centered about a senior design project which brings together the many aspects of materials science and engineering in a global context that prepares the student to function as a practicing engineer on a multi-disciplinary team
- Continuous improvement of written and oral communication skills throughout the curriculum through lab reports, papers and individual/group project presentations
- Emphasis of current science and technology materials in the curriculum and the relationship of the engineering profession in a societal and global context
- Integration of professional and ethical responsibility in the curriculum
- Mandatory semester advising and planning of individually tailored educational and curriculum goals for students
- Mandatory mentoring for four semesters, generally during the sophomore and junior years. This is intended to provide the student with increased access to faculty members and an opportunity to discuss career options and preparation with other faculty members in addition to their advisor

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
Freshman Year		
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
Total	15	16

*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
Total	14	17,16

*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
Total	16	15

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	3	3
ENRE 445/446		
or ENME 392 Statistical Methods—Principles of Quality and Reliability.		3
Upper-level science elective	3	
Total	18	15

Minimum Degree Credits: 124 or 125 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 advisor.

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 421 Design of Composites; ENMA 424 Manufacturing Ceramics; ENMA 423 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 423 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.

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 or Martinez-Miranda, the Undergraduate Advisors. Any questions about the program should be directed to Dr. Ray Phaneuf, Office of 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 advisor 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)

1113 Chemical and Nuclear Engineering Building, 301-405-5989

Professor and Chair: Briber

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/

Professor and Chair: Fitzpatrick

Professors: J. Adams, Antman††, Benedetto†, Berenstein, Boyle, Brin, Cohen, Cooper, Fey**, Freidlin††, Glaz, Goldman, Grillakis, Grove, Gulick, Halperin!!!!, Hamilton, Healy, Herb, Jakobson, Johnson, Kagan, Kedem, King, Kudla, Kueker, Laskowski, Lay†, Levermore***, Lipsman!!!, Lopez-Escobar, Liu***, Machedon, Millson, Nochetto, Novikov††, Osborn, Pego, Rosenberg, Schafer, Schwartz†††, Slud, Tadmor***!, Tzavaras, Washington, Wolfe, Wolpert!!!!, Yang, Yorke††***

Associate Professors: Dolgopyat, Dolzmann, Hunt***, Ramachandran, Smith, Trivisa, von Petersdorff, Warner, Winkelkemper

Assistant Professors: Haines, Kapovitch, Korolov

Chancellor: Kirwan

Professors Emeriti: W. Adams, Alexander, Auslander, Babuska††, Brace, Correl, Edmundson, Ehrlich, Ellis, Goldhaber, Good, Green, Heins, Horvath, Hubbard, Hummel, Kellogg, Kleppner, Lehner, Markley, Martin, Neri, Olver, Owings, Syski, Zedek

Associate Professors Emeriti: Berg, Dancis, Helzer, Sather, Schneider

Affiliate Professors: O'Leary, Stewart, Young

Adjunct Professor: Rinzel

Senior Lecturer: Gulick

Lecturers: Cremins, Daberkow, Franklin, McLaren, Stone, Wyss-Gallifent

†Distinguished Scholar Teacher

††Distinguished University Professor

†††Ruth Davis Professor

**Joint Appointment: Department of Curriculum and Instruction

***Joint Appointment: IPST

!Director, AMSC

!!Director, CSC AMM

!!!Associate Dean, UGST

!!!!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 340-341. Completion of MATH 340 satisfies the requirement for MATH 241; completion of MATH 340-341 satisfies the requirement for MATH 240-241-246.
2. One of the courses MATH 246, 341, 414, 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.

134 Mathematics

- (c) MATH 410: Most 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) STAT 410-420
- (e) The remaining 400-level MATH/AMSC/STAT courses are electives, but cannot include any of: MATH 400, 461, 478, 480-484, 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, 131, 132, ENAE 202, ENEE 114, or PHYS 165. A student 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 161-260/1-270/1
 - (ii) PHYS 171-272-273
 - (b) ENES 102, PHYS 161, ENES 220
 - (c) (i) CMSC 132-212-250
 - (d) (i) CHEM 146/7, 237, 247
 - (ii) CHEM 131/2, 231/2, 241/2
 - (e) ECON 200-201 (previously ECON 201-203), and one of ECON 305 or 306
 - (f) BMGT 220-221 and 340

SECONDARY EDUCATION TRACK

Major Requirements:

1. The introductory sequence MATH 140,141,240, 241 or the honors sequence MATH 340-341. Completion of MATH 340 satisfies the requirement for MATH 241; completion of MATH 340-341 satisfies the requirement for MATH 240-241-246.
2. One of the courses MATH 246, 341, 401, 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: Most 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 any of: MATH 400, 461, 478, 480-484, or STAT 464.
4. One course from CMSC 106, 114, 131, 132, ENAE 202, ENEE 114 or PHYS 165. 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 131/2 and 231/2
 - (b) PHYS 221 and 222
 - (c) PHYS 161-260/1
 - (d) BSCI 105 and 106
 - (e) ASTR 120 and 121
 - (f) AOSC 200 and 201, and any 400 level AOSC course.
 - (g) GEOL 100 and 110, and one of GEOL 322, 340, 341, 375.

*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 340-341. Completion of MATH 340 satisfies the requirement for MATH 241; completion of MATH 340-341 satisfies the requirement for MATH 240-241-246.
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) MATH 410. Most students are strongly encouraged to complete MATH 310 prior to attempting MATH 410
 - (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) Any 400-level or higher STAT courses except STAT 464
 - (ii) MATH 411, 412, 414, 424, 464
 - (iii) AMSC 477
 - (iv) BIOM 402
4. One course from CMSC 106, 114, 131, 132, ENAE 202, or ENEE 114 or PHYS 165. 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 5).

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 that clearly belong in this area are: MATH 402, 403, 404, 405, 406, 410, 411, 414, 430, 432, 436, 437, 445, 446, 452, 456, STAT 410, 411, 420. Students preparing for graduate school in mathematics should include MATH 403, 405, 410 and 411 (or 412) 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.

3. Statistics: For a student with a Bachelors 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, MATH 424, 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, 431, 436, 462, 463, 464, and MATH/AMSC 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 early registration. Students who have been away more than two years may find that due to curriculum changes the courses they have taken may no longer be adequate preparation for the courses required to complete the major. Students in this situation must meet with the Department Advisor to make appropriate plans.

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

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

Minors

The Department of Mathematics offers Minors in the following areas:

Actuarial Mathematics
Statistics

A Minor offers a structured program of study outside a student's major. A student who completes a Minor program (16 credits) will receive a certificate, and the accomplishment will be noted on the student's transcript. See www.math.umd.edu/undergraduate/opportunities 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 Abramowitz 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 (SEM) 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

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 advisors 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

1107 Mathematics, 301-405-5061

www.stat.umd.edu

Director: Smith

Professors: Freidlin, Kagan, Kedem, Liu***, Slud, Yang

Associate Professor: Smith

Professor Emeritus: Syski

***Joint Appointment: IPST

The Mathematical Statistics Program (within the Department of Mathematics) offers a variety of undergraduate courses to students in all disciplines as well as a graduate program for students concentrating in the study of Statistics, Probability and their application in real world problems.

In addition to an undergraduate program emphasizing Statistics that is available to majors in Mathematics, there are two minors in Statistics offered through the Department of Mathematics.

Minor in Statistics—for information contact Professor Paul Smith (pjs@math.umd.edu)

Minor in Actuarial Mathematics—for information contact Professor Eric Slud (evs@math.umd.edu)

Each of these Minors offers a structured program of 16 credits of study outside a student's major. A student who completes a Minor in Statistics will receive a certificate, and the accomplishment will be noted on the student's transcript. For more information, see www.math.umd.edu/undergraduate/opportunities/minors.shtml

Course code: STAT

136 Measurement, Statistics and Evaluation

MEASUREMENT, STATISTICS AND EVALUATION (EDMS)

College of Education

1230 Benjamin Building, 301-405-3624

www.education.umd.edu/EDMS

Professor and Chair: Dayton

Professors: Hancock, Lissitz, Macready, Mislevy

Associate Professor: Schafer (Emeritus)

Assistant Professor: Hendrickson

Adjunct Professor: Peng

Research Assistant Professor: Samuelson

Lecturers: Alvestad, Conley

For Advanced Undergraduates

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.

Course Code: EDMS

MECHANICAL ENGINEERING (ENME)

A. James Clark School of Engineering

2181 Engineering Classroom Building, 301-405-2410

www.enme.umd.edu

Professor and Chair: Bar-Cohen

Director, Office of Undergraduate Studies: Ainane

Professors: Azarm, Balachandran, Bar-Cohen, Barker, Baz, Bernard, Christou, Dasgupta, diMarzo, Duncan, Fourny, Gupta, A., Magrab, Modarres, Mosleh, Mote, Ohadi, Pecht, Piomelli, Radermacher, Wallace, Zachariah

Associate Professors: Bernstein, Bigio, Bruck, DeVoe, Gupta, S., Han, Herold, Herrmann, Jackson, Kiger, Kim, McClusky, Ramahi, Sandborn, Schmidt, Shih, Smela, Smidts, Zhang

Assistant Professors: Balaras, Cukier, Hsieh, Yang, Yu

Lecturers: Coder, Haslach, Kirk, Rothbloom, Schultz

Emeriti: Anand, Armstrong, Berger, Buckley, Cuniff, Dally, Dieter, Holloway, Jackson, Kirk, Marks, Roush, 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.

Program Educational Objectives

1. The program will prepare students for successful engineering careers.
2. Students will learn the fundamentals of mathematics, physical sciences, and engineering sciences and demonstrate the applications of this knowledge to Mechanical Engineering.
3. Students will learn through course sequences focused on specific, relevant mechanical engineering careers.
4. The program will provide students with practical design experiences through partnerships with industry.
5. The program will continue to raise the expectations of all constituencies, to attract a wide variety of excellent students, and to be a nationally recognized engineering program.

Learning Outcomes

- a. ability to apply knowledge of math, engineering, and science
- b. ability to analyze and interpret data
- c. ability to design and conduct experiments
- d. ability to design system, component or process to meet needs
- e. ability to function on multi-disciplinary teams
- f. ability to identify, formulate, and solve engineering problems
- g. understanding of professional and ethical responsibility
- h. ability to communicate effectively
- i. broad education
- j. recognition of need and ability to engage in life-long learning
- k. knowledge of contemporary issues
- l. ability to use techniques, skills, and tools in engineering practice

Requirements for Major

	Semester	
	Credit	Hours
Freshman Year		
	I	II
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
Total Credits	13	16
Sophomore Year		
MATH 241 Calculus III	4	
MATH 246 Differential Equations		3
PHYS 262, 270 General Physics	4	4
ENES 220 Mechanics of Materials	3	
ENES 221 Dynamics	3	
ENME 232 Thermodynamics		3
ENME 271 Introduction to MATLAB		3
CORE Requirements	3	3
Total Credits	17	16
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
Total Credits	15	15

Senior Year

ENME 462 Vibration, Controls, and Optimization II	3	
ENME 472 Integrated Product and Process Development II*	3	
Technical Electives*	9	9
CORE Requirements	3	3
Total Credits	12	18

*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
Environmental Engineering
Automotive Design
Robotics
Manufacturing
Fiber Optics
Micro-Electro-Mechanical Systems
Air Pollution & Waste Technology

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 advisor 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.

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)

See Atmospheric and Oceanic Sciences elsewhere in this chapter.

MICROBIOLOGY

Specialization courses in microbiology are offered by the Departments of Biological Sciences and Cell Biology and Molecular Genetics in the College of Chemical and Life Sciences.

SCHOOL OF MUSIC (MUSC)

College of Arts and Humanities

Clarice Smith Performing Arts Center, 301-405-5549
www.music.umd.edu

Director: Gibson

Associate Director: De Boy

Professors: Cohen, Cossa, Dedova, DeLio, Elsing, Fischbach, Gibson, Mabbs, Major, Montgomery, Moss, Page, Provine, Robertson, Rodriguez, Wexler

Associate Professors: Balthrop, Davis, Fry, Gekker, Gowen, Haggh-Huglo, Hanninen, Hill, King, Loup, Maclary, Miller, Ross, Salness, Sloan, Sparks, Stern, Vadala, M. Wilson, Ziegler
Assistant Professors: Hewitt, Silvey
Instructors: Walters

Lecturers: Adams, Adkins, Ames, Baldwin, Beicken, Burris, Cavallaro, Cole, Daughtry, Eguchi, Elliston, Evans, Fidyk, Folstrom, Foster, Galvin, Gero, Guilford, Hackelman, Hanks, Hardy, Heifetz, Hendrickson, Holly, Huling, Im, Jacobson, Johnson, Kellner, Kite, Kouyate, Kunkel, Layton, McFalls, McReynolds, Michnewicz, Murdock, Okamoto, Olcott, Osterloh, Ozmont, Pilzer, Randall, Sandtrom, Slowik, R. Smith, Sonneborn, Suadin, Tafoya, Teie, Trahan, Underwood, Volchok, Wagner, Weil, G. Wilson, Yazdanfor, Zimmerman

Adjunct Research Professor: Huglo

Visiting Professors: Dalley, Steinhardt, Tree, Wiley

Visiting Assistant Professors: Dueck, Ferguson

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.

138 Natural Resources Management Program

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

Designed for qualified students preparing for careers in K-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 134-140 credits):

- 26 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)

Minor in Music Performance

Eighteen credit hours consisting of the following:

- Four semesters of applied lessons (MUSP 302, 303, 402, 403)
- Four semesters of ensemble (chosen from MUSC 129, 229, 329)
- MUSC 130 Survey of Music Literature
- MUSC 140 Fundamentals of Music

Admission to the minor in music performance program is based on a required performance audition before a faculty committee. Audition dates and requirements are available from the School of Music office.

Students who fulfill Minor requirements will receive a Minor 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
301-405-1198; kmonahan@umd.edu

Associate Professor and Coordinator: Kangas
Associate Professor: Baldwin
Assistant Professor: Tilley
Adjunct Associate Professor: 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

	Credit Hours
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	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

	Credit Hours
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 131/132 General Chemistry	4
CHEM 231/232 Organic Chemistry I or	
CHEM 104 Fundamentals of Organic and Biochemistry	4
GEOG 340 Geomorphology or	3
GEOL 340 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

Additional Requirements for Option Area C:

Environmental Education and Park Management

	Credit Hours
ANTH 260 Introduction to Sociocultural Anthropology and Linguistics*	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
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
Program Coordinator: Chris Walsh; cswalsh@umd.edu
Program Management Specialist: Kathleen Hunt; khunt@umd.edu
www.nrsl.umd.edu/

Professor and Chair: Coale
Professors: Dernoeden, Fretz, Hill, James*, Kenworthy, McIntosh*, Miller, Ng, Quebedeaux, Rabenhorst, Solomos, Walsh, Weil, Weismiller
Associate Professors: Bouwkamp, Carroll, Coleman, Costa, Deitzer, Everts, Glenn, Grybauskas, Lea-Cox, Ritter, Slaughter, J.B. Sullivan, J.H. Sullivan, Swartz, Turner, Vough
Assistant Professors: Chang, Kratochvil, Momen, Myers, Needelman, Neel
Lecturers: Bosmans, Nola, Steinhilber
Professor of the Practice: Cohan
Affiliate Professors: Fiola, Kearney, Tjaden
Adjunct Professors: Cregan, Daughtry, Meisinger, Mucciardi, Rosenberg, Saunders, Tamboli
Adjunct Associate Professors: Christiansen, Izaurralde, Tucker
Adjunct Assistant Professors: Kane, Leonard, Pooler
Professors Emeriti: Aycock, Bandel, Beste, Clark, Decker, Fanning, Gouin, Hoyert, Kuhn, Link, McClurg, Mulchi, Oliver, Shanks, Strickling, 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 Agricultural Sciences. The third major leads to a Bachelor of Landscape Architecture (B.L.A.) degree. For additional information on General Agricultural Sciences and Landscape Architecture, see the entries for those programs earlier in this chapter.

Undergraduate students enrolled in the Natural Resource Sciences major must enroll in 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 Requirements for all Areas of Concentration	Semester Credit Hours
CHEM 131/132 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 271/272 General Chemistry and Energetics	4
CHEM 104 Fundamentals of Organic and Biochemistry, or CHEM 231/232 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

Applications & Breadth (Select three of the following)

NRSC 413 Soil and Water Conservation	3
NRSC 415 GIS Application in Soil Science	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)

NRSC 308 Field Soil Morphology	1-3
NRSC 389 Internship	3

140 Natural Resource Sciences

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 337 Biology of Insects	4
CHEM 104 Fundamentals of Organic and Biochemistry	4
NRSC 389 Internship	3
NRSC 411 Principles of Soil Fertility	3
PLSC 201 Plant Structure and Function	4
PLSC 202 Management of Horticultural Crops, or	
PLSC 271 Plant Propagation, or	
PLSC 203 Plants, Genes and Biotechnology	3
PLSC 400 Environmental Plant Physiology	3
PLSC 420 Principles of Plant Pathology	4
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	3
BMGT 220 Principles of Accounting I	3

PLSC 201 Plant Structure and 43tili6939(3)]TJ-

PLSC 305 Intr(PLSC 271 Plant Propagation, 9.59/T10 1 Tf0.0004 Tc 20.573 0 04-108)Tj/T11 118.4090.0207 Tc -0.-0.0162 Tc -0.0001 Tw T*[(NRSC 411 Prin57nhouse C

Suggested Core Courses and Electives¹

BIOM 301* Introduction to Biometrics	3
BSCI 460 Plant Ecology (3) or	
BSCI 460 & 461 Plant Ecology Lecture and Lab	5
CHEM 231/232* 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 413 Soil & Water Conservation	3
NRSC 415 GIS Application in Soil Science	3
NRSC 444 Remote Sensing of Agriculture and Natural Resources	3
NRSC 474 Silviculture	4
PHYS 121* Fundamentals of Physics I	4
PHYS 122* Fundamentals of Physics II	4
or the following two-semester sequence:	
PHYS 141* Principles of Physics	4
PHYS 142* Principles of Physics	4
PLSC 200 Surveying	2
PLSC 203 Plants, Genes and Biodiversity	3
PLSC 320 Principles of Site Engineering	3
PLSC 400* Environmental Plant Physiology	3
PLSC 473 Woody Plant Physiology	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

¹**Note:** Courses with an asterisk are suggested electives for students planning on graduate study in Forestry.

Minor in Landscape Management

The Landscape Management minor provides students with a foundation in plant sciences and business management. The required science courses lead to an integrative understanding of plant growth and development and the plant's responses to its environment. These courses also teach students the skills needed to recommend best management practices and to identify plant abnormalities in the landscape. The business courses in this minor foster an understanding of the business structure, human resource management and financial management associated with landscape management companies.

All courses presented in this minor must be passed with a grade of C or better. To complete this minor, students will be expected to complete an 18-19 credit course sequence. Students should also be aware that many of the courses in this minor list PLSC100, Introduction to Horticulture, as a prerequisite.

Advising system for the minor:

The NRSL Department has mandatory faculty advising for each of its major and minor programs. Students are required to meet with their faculty advisor at least twice a year.

Landscape Management Advisors (Dr. Steven Cohan, Dr. Chris Walsh)

Curriculum:

PLSC 253 Woody Plants for Mid-Atlantic Landscapes I	3
PLSC 254 Woody Plants for Mid-Atlantic Landscapes II	3
PLSC 305 Introduction to Turf Management	3
PLSC 361 Commercial Principles of Landscape Management	3
PLSC 452 Principles of Landscape Establishment and Maintenance	3

Select one of the following courses:

AREC 240 Introduction to Agriculture and the Environment	4
AREC 250 Elements of Agricultural and Resource Economics	3
AREC 306 Farm Management	3
BMGT 220 Principles of Accounting I	3

Total Credits: A minimum of 18 or 19 credits is required to complete this minor. (Depending on which AREC or BMGT course is chosen)

A student may use a maximum of six credits (or two courses) to satisfy the requirements of both a major and a minor. In the event that more than six credits of coursework listed above are required in the student's major, he or she should contact the Landscape Management faculty advisor for course substitutions.

This minor is particularly relevant to students who are interested in pursuing a career in the landscape industry. Landscape architecture, environmental science and policy, and life science majors can readily complete these minor requirements within their four-year programs.

Students from the business school and social sciences who are seeking managerial careers in this rapidly-expanding service industry would also find this minor to be relevant.

Minor in Soil Science

This minor will provide students with a sophisticated understanding of the soil resource, its development, characteristics, and principles for its use and management. Building on a basic introduction to the broad field of soil science, the program is completed by adding four or five upper division soils courses balanced between underlying principles and field applications.

All courses presented for the minor must be passed with a grade of C or better. Declared majors in the Conservation of Soil Water and Environment Area of Concentration of NRSC or the Land and Water option in ENSP may not also minor in Soil Science.

Advising system for the minor:

The NRSL Department has mandatory faculty advising for each of its major and minor programs. Students are required to meet with their faculty advisor at least twice a year.

Soil Science Advisors (Dr. Ray Weil, Dr. Robert Hill)

Curriculum:

NRSC 200 Fundamentals of Soil Science (4)

Select 13 credits from the ten courses listed below. At least two courses must be from Group A.

GROUP A – Underlying Principles

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

GROUP B - Applications

NRSC 308 Field Soil Morphology	1
NRSC 413 Soil and Water Conservation	3
NRSC 415 GIS Applications in Soil Science	4
NRSC 423 Soil-Water Pollution	3
NRSC 461 Wetland Soils	3

Total Credits: A minimum of 17 credits is required to complete this minor.

Students attempting this minor will need MATH 113 or higher. There are a total of 17 required credits in NRSC classes, plus a 4 credit chemistry prerequisite. Depending on the pre-requisites needed and the optional courses selected and pre-requisites, students will take between 17 and 24 credits.

This minor is particularly relevant to students majoring in Agricultural and Resource Economics, Geology, Geography, Environmental Science and Policy, Biology, Biochemistry, Chemistry, Anthropology, Architecture, Agriculture Science and Technology, Horticulture and Crop Production, Animal Science, Landscape Architecture, Parks and Planning, Biological Resource Engineering, Civil Engineering, and Environmental Engineering.

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.

142 Nutrition and Food Science

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, 301-405-4355.

NUTRITION AND FOOD SCIENCE (NFSC)

College of Agriculture and Natural Resources

0112 Skinner Building, 301-405-4520 - fax: 301-314-3314

www.agnr.umd.edu/nfsc

Chair: Parish

Professors: Bean, Castonguay, Lei, Parish

Associate Professors: Jackson, Kantor, Lo, Meng, Yu

Assistant Professors: Magnuson, Sahyoun

Lecturer: Brenowitz

Adjunct Professor: DeLuca, Hansen

Adjunct Associate Professor: McKenna

Research Professor: Lineback

Emeriti: Ahrens, Moser-Veillon†, 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	3
NFSC 350 Food Service Operations	5
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
Subtotal	35

b. Supporting Courses	
MATH 113 Elementary Algebra or	
MATH 115 Precalculus	3
CHEM 131/132 General Chemistry I with Lab	4
CHEM 231/232 Organic Chemistry I with Lab	4
CHEM 241/242 Organic Chemistry II with Lab	4
CHEM 271/272 General Chemistry and Energetics	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 Elective	3
Electives	2
Subtotal	85
TOTAL CREDITS	120

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 Food Processing Technology	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
Subtotal	35

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 131/132 General Chemistry I with Lab	4
CHEM 231/232 Organic Chemistry I	4
CHEM 241/242 Organic Chemistry II	4
CHEM 271/272 General Chemistry and Energetics	4
BCHM 463 Biochemistry of Physiology	3
BSCI 105 Principles of Biology	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
Subtotal	85
TOTAL CREDITS	120

III. Nutritional Science

a. Major Subject Courses	
NFSC 100 Elements of Nutrition	3
NFSC 112 Food Science and Technology	3
NFSC 315 Nutrition during the Life Cycle	3
NFSC 421 Food Chemistry	3
NFSC 440 Advanced Human Nutrition	4
NFSC 450 Food and Nutrient Analysis	3
NFSC 495 Nutrition Research or CORE Advanced Studies	3
Subtotal	22

b. Supporting Courses	
MATH 113 Elementary Algebra OR	
MATH 115 Precalculus	3
MATH 220 Elementary Calculus I	3
CHEM 131/132 General Chemistry I	4
CHEM 231/232 Organic Chemistry I	4
CHEM 241/242 Organic Chemistry II	4
CHEM 271/272 General Chemistry and Energetics	4
BSCI 105 Principles of Biology I	4
BSCI 222 Genetics	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
Additional CORE program requirements	24
Restricted elective	3
Electives	5
Subtotal	98
TOTAL CREDITS	120

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 advisor. 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 Technology 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 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, Morris, Pietroski, Rey, Svenonius

Associate Professors: Brown (Emeritus), Kerstein, Lichtenberg, Manekin, Morreau, Odell, Stairs

Assistant Professors: Frisch, Schroeder

Affiliate Professors: Brush, Crocker, Fullinwider, Galston, Hornstein, Levine, Li, Sagoff, Segal, Wachbroit, Wasserman

Adjunct Professors: Berkovitz, Dwyer, Levine, Mattingly, Rynasiewicz, Schaffner, Silberstein, Wallace

The Major

The study of philosophy develops students' reasoning 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 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

- (1) A total of at least 36 hours (twelve courses) in philosophy, not counting Internship course (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, philosophy of mind, and philosophy of religion, as well as metaphysics and theory of knowledge).
- (3) A grade of C or higher in each course counted towards the Major.

Fifteen hours in a supporting area; the courses do not all have to be in the same department, but they should reflect a coherent program of study. The supporting area must be chosen in consultation with a departmental advisor. For further information, students should consult the undergraduate handbook on the philosophy department's website.

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.

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

The Minor

The study of philosophy develops students' reasoning 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 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 the Minor

1. A total of 18 hours (six courses) in philosophy, not counting PHIL 386.
2. At least three courses numbered 300 or above; at least one course numbered 200 or above in the history of pre-twentieth-century philosophy; at least one course numbered 200 or above in value theory (including aesthetics and political philosophy as well as ethics); at least one course 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 minor requirement.

Course Code: PHIL

PHYSICAL EDUCATION

See Kinesiology elsewhere in this chapter.

PHYSICAL SCIENCES PROGRAM

College of Computer, Mathematical, and Physical Sciences

1120 Physics Building, 301-405-5979

www.physics.umd.edu/psci

E-mail: phys-ugradinfo@physics.umd.edu

Chair: Einstein

Astronomy: Deming

Chemistry: Montague-Smith

Computer Science: Ozga

Geology: Merck

Engineering: Salamanca-Riba

Mathematics: Fleming

Meteorology: Hudson

Physics: Einstein

Advisor: Gleason

144 Physical Sciences Program

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. 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 135/136 and 231/232 (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 Programming: CMSC 106, PHYS 165, ENEE 114, or other courses with approval of the PSCI committee. Students who choose CMSC as an area of concentration will need to complete additional lower-level CMSC courses.
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.

Advising

Advising for undergraduates is available throughout the year in Room 1120 PHY. For early registration, advising is mandatory; students should check Testudo for their early registration date and should sign up for an appointment in Room 1120 PHY. Students who have been away more than two years may find that due to curriculum changes the courses they have taken may no longer be adequate preparation for the courses required to complete the major. Students in this situation must meet with the Program Advisor to make appropriate plans.

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:

- Overall grade point average of 3.0 or better.
- Physical Sciences courses grade point average of 3.2 or better.
- 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).
- An honors thesis summarizing independent research submitted to the Physical Sciences Committee.
- 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 Chemical and 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

Professor and Chair: Goodman*

Professors and Associate Chairs: Baden, Chant, Roberts

Professors Emeriti: Banerjee, C. Y. Chang, Currie, DeSilva, Dragt, Falk, Ferrell, Glick, Glover, Gluckstern, Goldenbaum, Griem, Holmgren, Kacser (Associate Professor Emeritus), Layman, Misner, Prange, Richard, Sucher, Woo

Chancellor Emeritus: Langenberg, Toll

President Emeritus: Gluckstern

Distinguished University Professors: Das Sarma, Fisher, Gloeckler, Ott, Phillips***, Ramesh, Sagdeev, Sreenivasen, Webb (Alford Ward Chair), Williams**, Yorke

Professors: Alley, Anderson, Anlage, Antonsen, Baden, Beise, Bhagat, Boyd, Brill, C. C. Chang, Chant, Chen, Chulakov, Cohen, Chubukov, Dorfman*, Drake, Drew, Einstein, Eno, Gates* (Toll Chair), Goodman*, Greenberg, Greene, Griffin, Hadley, Hamilton, Hassam, Hu, Jacobson,

Jawahery, Ji, Kelly, Kim, Kirkpatrick, Korenman, Langenberg, Liu, Lobb*, Mason, Milchberg*, Mohapatra*, Orozco, Paik, Papadopoulos, Park, Pati, Redish, Rolston, Roos, Roy, Skuja, Wallace, Wellstood, Yakovenko

Associate Professors: Buonanno, Dorland, Ellis, Fuhrer, Hammer, Lathrop, Luty, Roberts, Seo, Sullivan

Assistant Professors: Bedaque, Hoffman, Losert, Ouyang

Affiliated Professors: Hill, Panagiotopoulos, Phaneuf, Takeuchi, Weeks

Professor of the Practice: Berg

Senior Research Scientists: Dragt, Venkatesan

Adjunct Professors: Boldt, Lynn, Mather, Schwab

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:

Lower-level courses for all areas of concentration	Credit Hours
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
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 135/136 Chemistry for Engineers/Lab	4
MATH 462 Partial Differential Equations for Scientists and Engineers	3
AOSC 431 Meteorology for Scientists and Engineers I	3
AOSC 432 Meteorology for Scientists and Engineers II	3
AOSC 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

*The PHYS 401-402 sequence in the Meteorology Physics area of concentration may be replaced by two of the following courses:

PHYS 405: Advanced Experiments	3
PHYS 406: Optics	3
PHYS 410: Classical Mechanics	4
PHYS 411: Intermediate Electricity and Magnetism	4
PHYS 420: Principles of Modern Physics	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

146 Plant Biology

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.

CHEM 231/232 Organic Chemistry/Lab

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.

Advising

Advising for undergraduates is available throughout the year in Room 1120 PHY. For early registration, advising is mandatory; students should check Testudo for their early registration date and should sign up for an appointment in Room 1120 PHY. Students who have been away more than two years may find that due to curriculum changes the courses they have taken may no longer be adequate preparation for the courses required to complete the major. Students in this situation must meet with the Departmental Advisor to make appropriate plans.

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

Minor in Physics

This minor provides a rigorous foundation in physics for students who choose not to complete the entire physics major. The minor begins with a set of two introductory courses (6 credits) in electromagnetic fields (PHYS 262 or PHYS 272) and waves (PHYS 263 or PHYS 273). As part of this introduction to Physics, the minor also requires a one-credit introductory physics laboratory (PHYS 174, PHYS 261, or PHYS 271) involving techniques of data gathering and analysis. To obtain a deeper understanding of physics, the minor requires three 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), and computational physics (PHYS 474). Other upper level Physics courses can be substituted only with approval from the Department's undergraduate director and the Faculty Minor Advisor. All courses must be completed with a grade of C or better to be counted towards the minor. No more than 7 credits in this minor can count toward major requirements. Students with more than 7 credits of overlap must substitute non-overlapping 300 or 400 level courses from the above list to reduce the overlap to no more than 7 credits. Students interested in taking this minor program should contact the undergraduate office in the Department of Physics for advising. Physics majors and students majoring in Astronomy are not eligible to complete the Physics Minor due to the large number of overlapping course requirements.

Courses required for the minor are: (7 Credits):

- PHYS 174: "Physics Laboratory Introduction (1)", or PHYS 261: "General Physics: Vibrations, Waves, Heat, Electricity and Magnetism: Laboratory (1)", or PHYS 271: "General Physics: Electrodynamics, Light, Relativity and Modern Physics: Laboratory (1)"
- PHYS 272 "Introductory Physics: Fields (3)", or PHYS 260: "General Physics: Vibrations, Waves, Heat, Electricity and Magnetism (3)"

- PHYS 273: "Introductory Physics: Waves (3)" or PHYS 270: "General Physics: Electrodynamics, Light, Relativity and Modern Physics (3)".

In addition, the student must choose three from the following: (9-12 Credits):

- PHYS 374: Intermediate Theoretical Methods (4)
- PHYS 375: Experimental Physics III: EM Waves, Optics & Modern Physics (3)
- PHYS 401: Quantum Physics I (4)
- PHYS 402: Quantum Physics II (4)
- PHYS 404: Introductory Statistical Thermodynamics (3)
- PHYS 410: Classical Mechanics (4)
- PHYS 411: Intermediate Electricity and Magnetism (4)
- PHYS 465: Modern Optics (3)
- PHYS 474: Computational Physics (3)

Prerequisites

MATH 140 (4 credits), MATH 141 (4 credits), MATH 241 (4 credits), MATH 240 (4 credits), MATH 246 (3 credits), and Physics 161 (or Physics 171) (3 credits) are prerequisites for some of the courses in this program.

Contact

Students interested in earning a minor in physics should contact the undergraduate advisor for the Physics Department:

1120F John S. Toll Physics Building
301-405-5979

phys-ugradinfo@physics.umd.edu

Note: At the beginning of the semester in which graduation is intended, a student should make an appointment with the Physics Department's Undergraduate Advisor to fill out the paperwork needed to get the Minor on the official transcript.

PLANT BIOLOGY

Departments in the College of Chemical and 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/undergraduate/

Professor and Chair: Hall

Professor, Associate Chair and Director of Graduate Studies: Sigall
Professors: Anderson (Emerita), Bellack**, Brauth, Cassidy, Coursey (retired), Collewijn**, Dooling, Fox*, Fretz (Emeritus), Gelso, Goldstein, Gollub (Emeritus), Hanges, Hill, Hodos, Kowler**, Kruglanski, Lissitz*, Locke*, Martin (retired), McIntire (Emeritus), J. Mills, Moss, Ostroff, Penner (Emeritus), Popper*, Rosenfeld*, Schneider (retired), Scholnick, Smith, Stangor, Steinman, Sternheim, Suomi**, Torney-Purta*, Tyler (Emeritus), Waldrop (Emeritus), Wallsten, Woodward, Yeni-Komshian (Emerita)*
Associate Professors: Blanchard, R. Brown (retired), Dougherty, Freeman (Emeritus)*, Gelfand, Gold**, Jekka*, Larkin (retired), Lejuez, Leone*, Murnane, Norman, O'Brien, O'Grady, Schneiderman*, Steele, Yager
Assistant Professors: J. Carter**, Castles**, Chronis, Fago**, Hazel-Johnson**, Herberholtz, Huber, Marx**, Miller**, Pompilo**, Reibsame*, Royalty**, Spiefel**, Sprei**, Tashiro, 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 advisor.

Requirements for Major

All students must take at least 35 credits in Psychology including 14 credits at the 400-level. PSYC 309C, 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
 Area II: 221, 341, 420, 423, 424, 440, 442, 443
 Area III: 235, 318, 319, 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, 463, 464, 465, 466
 No Area: 415

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 should 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 part of the requirement for the B.S. degree. Students should consult the current Psychology Undergraduate website 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 psychology 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 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 in Psychology. 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 can be arranged by contacting the undergraduate office, 1107 Biology-Psychology Building at 301-405-5866. Visit www.bsos.umd.edu/psyc/undergraduate 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.

Experiential Learning

The department offers internships in psychology through PSYC 386. Visit www.bsos.umd.edu/psyc/undergraduate/intern.html

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 or at www.bsos.umd.edu/psyc/undergraduate/.

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

Professor and Chair: Glover

Professors: Beck, Boekelvo, Burt, Feldman, Glover, Gold, Greenberg, Leviton, Wang, Wilson

Associate Professors: Boekeloo, Desmond, Howard, Thompson

Assistant Professors: Ackinson, Hsu

Instructors: Hyde, Schiraldi, Sharp

148 Romance Languages

The Major

Students graduate with a Bachelor of Science degree in Community Health which prepares students for entry-level health education positions in a variety of community health settings: worksite health promotion, research and development, hospitals, and health agencies.

Requirements for Major

In addition to the University's CORE, students must fulfill four other general sets of requirements: Electives, Supportive Requirements, Health Electives, and Professional Preparation. HLTH491, the Community Health Internship, is completed during the student's final semester and after all other course work has been successfully completed.

Community Health Major - 120 Credits

Supportive Requirements (32 Credits)

HLTH 130 Introduction to Public & Community Health	3
HLTH 140 Personal and Community Health	3
HLTH 150 First Aid and Emergency Medical Services	2
HLTH 230 Introduction to Health Behavior	3
BSCI 105 Principles of Biology	4
BSCI 201 Anatomy and Physiology I	4
BSCI 202 Anatomy and Physiology II	4
EDMS 451 Introduction to Educational Statistics	3
One upper level course from any two departments: EDCP or EDHD or FMST (6 Credits)	

Health Electives (18 Credits)

(Any 6 courses - No more than two experiential courses+)

HLTH 106 Drug Use and Abuse	3
HLTH 285 Controlling Stress and Tension	3
HLTH 371 Communicating Health and Safety	3
HLTH 377 Human Sexuality	3
HLTH 38x Peer Education +	3
HLTH 400 Serving Learning in Health Education +	3
HLTH 430 Health Education in the Workplace	3
HLTH 437 Consumer Behavior	3
HLTH 460 Minority Health	3
HLTH 471 Women's Health	3
HLTH 476 Death Education	3
HLTH 485 Ways of Knowing About Stress	3
HLTH 487 Adult Health and Development +	3
HLHP 488 Children's Health and Development Clinic +	3
KNES 360 Physiology of Exercise	3
NFSC 100 Elements of Nutrition	3

Electives 16

Professional Preparation (21 Credits)

HLTH 391 Principles of Community Health I	3
HLTH 420 Methods and Materials in Health	3
HLTH 490 Principles of Community Health II	3
HLTH 491 Community Health Internship	12
Community Health in the Workplace	(3)

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

For information, see listing under School of Languages, Literatures, and Cultures, French and Italian, elsewhere in this chapter.

RUSSIAN LANGUAGES AND LITERATURES

For information, see listing under School of Language, Literature, and Cultures, 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

Professor and Chair: Falk

Professors: Bianchi, Clignet (Emeritus), Dagger (Emeritus), Dill* (Women's Studies), Falk, Fink* (Speech Communication), Finsterbusch, Gurevitch* (Journalism), Hage+ (Emeritus), Hamilton, Hampton* (Family Studies), Kammeyer (Emeritus), Lejins (Emeritus), Levy* (Journalism), Lucas, 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 (Emeritus), L. Hunt, Kahn, Kestnbaum, Korzeniewicz, Landry, Larsen, Lengermann, Milkie, Neustadt, Pease

Assistant Professors: DeRose, Lucas, Mamo, 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:
 - 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 with a minimum grade of C;
- 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. Sociology internship credit does not count toward meeting requirements for the major.

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 LITERATURES (SPAN, PORT)

For more information, consult School of Languages, Literatures, and Cultures elsewhere in this chapter.

SPECIAL EDUCATION (EDSP)

College of Education

1308 Benjamin Building, 301-405-6515/4
www.education.umd.edu/EDSP/

Professor and Chair: Burke

Professors: Beckman, Egel, Hebeler (Emeritus), Leone, Lieber, McLaughlin, Moon, Neubert, Speece

Associate Professors: Cooper, Kohl, Maccini

Assistant Professors: Drakeford, Staples

Research Associates: Barnwell, Greig, Grigal, Gruber, Kelly, Meisel, Nagle, Warren

Undergraduate Coordinator: Molloy

Lecturers: Aiello, Brown, Case, Danehey, Fink, Hudak, Johnson, Thanhouer, Waranch

Faculty Research Assistants: 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;

150 Special Education

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

Changes in requirements are under review. Students should contact the Department for updated information. 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 combined program 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 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.
5. Completion of College of Education Technical Standards Acknowledgment Form.

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 212	3
*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)	
EDSP 422 Curriculum and Instruction: Early Childhood Special Education	3
EDSP 487/687 Family Partnerships in Special Education	3
EDSP 404/604 Education of Students with Autism	3
EDSP 431 Field Placement V: Early Childhood Special Education	4
EDSP 490/690 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 487/687 Family Partnerships in Special Education	3
EDSP 455 Assessment in Elementary Special Education	3
EDSP 486/686 Promoting Prosocial Behavior in Special Education	3
EDSP 456 Field Placement V: Elementary Special Education	4
EDSP 490/690 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 487/687 Family Partnerships in Special Education	3
EDSP 486/686 Promoting Prosocial Behavior in Special Education	3
EDSP 436 Field Placement V: Secondary/Middle Special Education	4
EDSP 490/690 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

2810 Clarice Smith Performing Arts Center, 301-405-6676

E-mail: thetinfo@umd.edu

www.theatre.umd.edu

Acting Chair: Wagner

Professors: Hébert, Hildy, Huang, Wagner

Associate Professors: Conway, Nathans, Reese, Schuler

Assistant Professors: Burgess, Smiley

Instructors: Deighton, Kriebs

Emeritus: Gillespie, Meersman, Patterson, Pugliese

The Major

Small classes, diversity, and a close-knit departmental environment promote a strong sense of community within the Department of Theatre. An extensive production schedule offers students a myriad of opportunities to practice their craft. The Department is a supportive and stimulating environment that fosters students' creative development and spurs their achievements. A comprehensive new curriculum embraces the liberal arts approach to theatre study and cultivates skills—discipline, creativity, self-confidence and critical thinking—that are valuable in all career fields. Our performance and design/production faculty members are active in professional theatre—members of Actors Equity and United Scenic Artists—providing students a vital link to the world of professional theatre. Our history/theory faculty members regularly publish and participate at national and international conferences. Situated in close proximity to the vibrant and stimulating theatre world of Washington D.C and Baltimore, students have ready access to the best of contemporary and classical productions at more than 80 professional theatres and enjoy a unique opportunity to participate through internships and other projects. The state-of-the-art Clarice Smith Performing Arts Center features six performing venues and also houses the Department of Dance, School of Music and the Michelle Smith Performing Arts Library.

The Department of Theatre offers a balanced, liberal arts education that integrates production, design, and scholarship. Under this curriculum, students will gain a strong foundation in the theatre arts, and have the opportunity to tailor the degree to their own interests and strengths. Additional advanced coursework is available as well, and is designed to prepare students for their next step, whether it is into graduate school, the profession, or another field entirely.

Requirements for Major

Requirements for the College of Arts and Humanities include a minimum of 45 upper-level credits and a foreign language requirement.

Students in the Theatre major prior to fall 2005 should consult the Department for prior curriculum requirements.

Major requirements include 55 credits of course work in Theatre – 40 credits in THET and 15 credits in Supporting Courses. Of the 55 credits, at least 27 credit hours 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. No course for the major may be taken Pass/Fail.

FOUNDATION SERIES: 19 credit hours required

All majors must complete the following fundamental courses (19 credits), which are open only to theatre majors: THET 112, Fundamentals of Performance; THET 113, Fundamentals of Theatre History; THET 114, Fundamentals of Theatre Craft; THET 115, Fundamentals of Analysis; THET 116, Fundamentals of Design; THET 479, Production Practicum (1 credit repeated three times); and THET 288, Fundamentals Project (1 credit).

- Fundamentals courses may be taken in any sequence
- Four out of the five courses should be completed by the end of the second semester or 30 credits
- Students may register for Area Menu courses in the 3rd semester if 4 of the 5 fundamentals courses (THET 112-116) are completed
- THET 288 is taken in the 3rd or 4th semester
- Students are expected to complete THET 112-116 and THET 288 must be completed by the end of the 4th semester or 60 credits
- THET 479 (3 - 1 credit courses for a total of 3 credit hours) cannot be taken until THET 114 is completed
- THET 479 must be completed in 3 different areas— costume, scenic, lighting and sound
- Students are expected to complete one THET 479 course by the end of the 4th semester or 60 credits, and all 3 courses by the end of the 6th semester or 90 credits.

AREA MENU: 21 credit hours required

Students must take courses from each Area as delineated below. Students may enter the Area Menu in the third semester, after completing the appropriate prerequisites.

Performance Area: 6 credit hours required

Courses marked with an “*” require an audition. Students may only audition twice for each course requiring an audition for enrollment.

THET 210, THET 220, *THET 310, *THET 324, *THET 325, THET 330, *THET 411, *THET 420, THET 424, *THET 425, THET 430, *THET 451, *THET 452

Design/Production Area: 6 credit hours required

Some courses require departmental or instructor approval

THET 273, THET 282, THET 284, THET 371, THET 372, THET 373, THET 377, THET 380, THET 383, THET 384, THET 457/669, THET 465, THET 470, THET 471/672, THET 472, THET 473, THET 474, THET 475, THET 477/675, THET 481, THET 482, THET 483/679

History/Theory Area: 9 credits required (6 of which must be at the 400 level)

THET 290, THET 291, THET 293, THET 294, THET 350, THET 388, THET 488, THET 489

All seminars offered at the 400/600 level require undergraduate students to obtain permission from the instructor and to have completed either THET 488 or 489.

THET 408/608, THET 410/610, THET 486/686, THET 487/608, THET 498/698

SUPPORTING COURSES: 15 credit hours

Supporting course credits may come from the Performance, Design/Production, or History/Theory Area Menus OR from any of courses listed in the Supporting Courses Menu OR any combination of the four menus. Students may also petition to their advisor for other suitable courses to be accepted, conditional on course work relating to their area of focus. For course prerequisites - Contact the Department that is offering the course or check Testudo online.

ARTH 200, ARTH 201, ARTH 250, ARTH 275, ARTH 290, ARTT 100, ARTT 110, ARTT 150, ARTT 200, ARTT 334, ARTT 353, ARTT 354, CLAS 374, CLAS 375, DANC 482, DANC 483, DANC 210, ENGL 304, ENGL 403, ENGL 404, ENGL 434, ENGL 450, ENGL 451, ENGL 454, LATN 301, LATN 302, MUSC 230, MUSC 330, SPAN 424, SPAN 436, SPAN 437, SPAN 456, SPAN 462, SPAN 473, THET 299, THET 386, THET 399, THET 406/606, THET 429 (up to 4 credits), THET 479 (2 credits beyond the 3 required), THET 499

152 Women's Studies

Advising

Advising is mandatory each semester for undergraduate theatre majors. Students should go to the Department of Theatre website for instructions and to sign up for an advising appointment.

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 Association Scholarships. For further information visit the website at www.theatre.umd.edu/Undergraduate

Course Code: THET

WOMEN'S STUDIES (WMST)

College of Arts and Humanities

2101 Woods Hall, 301-405-6877

www.womensstudies.umd.edu

Professor and Chair: Dill

Professors: Bolles, Moses, Rosenfelt, Zambrana

Associate Professors: Barkely Brown, Kim, King

Visiting Assistant Professors: Grossman

Affiliate Professors: Harley, Wilson (Afro-American Studies); Michel, Parks, Sies, Struna, Williams-Forsen (American Studies); Friedenber, Paolisso (Anthropology); Nieves (Architecture); Jones, Kerkham, Liu (Asian and East European); Greer (Chemical Engineering); Doherty, Hallett, Stehle (Classics); Aldoory, Parry-Giles, Tonn, Toth (Communication); Collins, Fuegi (Comparative Literature); Fassinger (Counseling and Personnel Services); Linn, Marshall (Curriculum and Instruction); Lin (Education, Policy and Leadership); Coletti, Donawerth, Kauffman, Leonardi, Lindemann, Logan, Nunes, Peterson, Ray, Rosenthal, Smith, Washington (English); Leslie (Family Studies); Letzter, Mossman (French and Italian Languages and Literature); Frederiksen, Oster, Strauch (Germanic Studies); Bush, Gullickson, Lyons, Muncy, Vaughan, Weinstein, Ziif (History); Beasley (Journalism); Robertson (Music); Fullinwider, Li (Philosophy and Public Policy); O'Brien, Scholnick (Psychology); Bianchi, DeRose, Desai, Milkie, Moghadam, Presser, Segal (Sociology); Cypess, Peres, Rodriguez (Spanish and Portuguese Languages and Literature); 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

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 electives 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.

JOINT MINOR IN BLACK WOMEN'S STUDIES

College of Arts and Humanities

2101 Woods Hall, 301-405-6877
www.umd.edu/wmst

College of Behavioral and Social Sciences

2169 Lefrak Hall
www.bsos.umd.edu/aasp

See African American Studies Department or Women's Studies Department for faculty roster.

The joint minor in Black Women's Studies focuses on the lives and experiences of women of Africa and the African Diaspora. As a specialty in the fields of Women's Studies and African American Studies, it will provide students with tools for understanding the social and cultural contexts in which race, gender, class, sexuality, ethnicity, nation and other dimensions of difference intersect to influence the lives and experiences of Black women.

Fifteen (15) credits of coursework are required, distributed below. A number of courses may count in more than one category. No course with a grade less than C may be used to satisfy the minor. Students will design their program in consultation with the Women's Studies or African American Studies advisor. No more than two courses may count toward a major in African American Studies of Women's Studies.

Foundation courses (6 credits)

WMST263/AASP203 Introduction to Black Women's Studies OR
 WMST265/AASP213 Constructions of Manhood and Womanhood in the Black Community
 AASP313/WMST314 Black Women in U.S. History

Distributive Requirements (9 credits)

Area I – Comparative or Non-US Course – indicated by a * below (3 credits)

Area II – Humanities (3 credits)

WMST263/AASP203 Introduction to Black Women's Studies
 THET240 African Americans in Film and Theater
 *ENGL362 Caribbean Literature in English
 *FREN478B Themes and Movements of French Literature in Translation: Francophone Women Writers

Area III – Social Sciences (3 credits)

WMST265/AASP213 Constructions of Manhood and Womanhood in the Black Community
 HIST319 Women and the Civil Rights Movement
 *WMST360 Caribbean Women
 *WMST410 Women of the African Diaspora
 WMST488 Senior Seminar—Black Women in the Public Eye
 AASP493 Feminist and Nationalist Thought in the Black Community
 WMST498 Black Feminist Thought
 WMST498 Womanisms and Feminisms: Theories and Methods (proposed course)
 AASP483 Gender, Sexuality and the Black Family

Advising

African American Studies or Women's Studies undergraduate advisor.

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 Chemical and Life Sciences have been reorganized. Courses in zoology are now offered by the Department of Biology.

OTHER FOR-CREDIT PROGRAMS

Air Force Reserve Officer Training Corps Program (AFROTC)

Aerospace Studies Program, 301-314-3242
 2126 Cole Student Activities Building
 Director: Colonel Ernie Haendschke
www.afrotc.umd.edu

The Air Force Reserve Officer Training Corps (AFROTC) provides students the opportunity to earn a commission as a second lieutenant in the United States Air Force while completing their undergraduate degree. AFROTC scholarship programs provide scholarships to high school and in-college students on a competitive basis.

For more information, see Office of Undergraduate Studies section in Chapter 6.

Army Reserve Officer Training Corps Program (ROTC)

1150 Cole Student Activities Building
 Director: Lieutenant Colonel Dennis McFadden
 301-314-9238
www.armyrotc.umd.edu

The Army Reserve Officer Training Corps offers students the opportunity to earn a commission as a Second Lieutenant in the United States Army (Active, Reserve, or National Guard) while completing their undergraduate degree.

For more information, see Officer of Undergraduate Studies section in Chapter 6.

College Park Scholars Program (CPSP)

1125 Cumberland Hall, 301-314-CPSP (2777)
 Executive Director: Greig Stewart
www.scholars.umd.edu

College Park Scholars is an innovative, two-year living/learning program for academically talented students. Admission is by invitation. Upon admission to the program, Scholars choose one of the 12 multidisciplinary academic programs as a focus, and have an opportunity to live together with other students in that program in specially designated College Park Scholars' residence halls.

For more information, see Office of Undergraduate Studies section in Chapter 6.

Gemstone

0102 Ellicott Hall
 Faculty Director: Dr. James Wallace
www.gemstone.umd.edu

Gemstone is a four-year program whose students come from many different majors and with a variety of interests. They have a unique opportunity to explore the interconnections between Science, Technology, and Society in a program involving special GEMS courses, but most importantly as members of undergraduate research teams. Under the guidance of faculty mentors, Gemstone students carry out interdisciplinary research on problems that involve science and/or technology. Rather than merely considering these problems from a technical point of view, Gemstone research projects often take into consideration history, ethics, politics, sociology, psychology and business among other perspectives. Some of the topics that recent Gemstone students have worked on include: the use of thermal energy from the human body to power small electrical devices, remediation of soil polluted with heavy metals using biotechnology, promotion of the use of tidal wetlands for shoreline erosion control around the Chesapeake Bay, development of "smart" pavement markers for traffic control, implementation of inclusive recreational programs for children with disabilities, investigation

154 Study Abroad Programs

of the dangers of electro-magnetic pulses used by terrorists, and development of a supplemental teaching kit to promote multi-cultural education for fourth graders. Students in the Gemstone Program select their research topics during their freshman year through a discussion-based process led by upper class Gemstone students. Team research begins in earnest at the beginning of the sophomore year and continues into the senior year when each team writes a team thesis and then defends it in front of a distinguished panel made up of individuals from academia, industry, and government. Students who successfully complete the Gemstone Program receive the Gemstone Citation, which appears on their transcript.

What Gemstone provides participants is the experience of learning to do original research with a team of high achieving students under the supervision of a faculty mentor. It also makes opportunities available for students to develop leadership and citizenship qualities. Less tangible but of equal importance, the Program exists as a living-learning environment in which its students are supported by the Gemstone staff, mentors and their fellow students in both their academic endeavors and some social activities.

University Honors Program

Anne Arundel Hall, 301-405-6771
Director: Dr. Barbara L. Thorne
www.honors.umd.edu

The University Honors Program offers special educational opportunities and resources to students with exceptional academic talents. Admission is by invitation. Honors seminars offer small class size (capped at 20 students) academic experiences characterized by active participation, intensive writing, and outstanding faculty who encourage critical thinking and innovation.

For more information, see Office of Undergraduate Studies in Section 6.

Study Abroad Programs

1101 Holzapfel Hall, 301-314-7746
Email: studyabr@deans.umd.edu
www.umd.edu/studyabroad
Associate Director: Michael Ulrich

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 to be essential for their major or career plans. Others view it as part of their liberal arts education.

Advising and Information

In addition to coordinating the University of Maryland's study abroad programs, the Study Abroad Office staff offers advising to all students interested in studying abroad. The office's resource library provides information on programs offered by other universities. The staff also assists students in obtaining credit for their experience abroad. Dependent on departmental approval, students may use study abroad to enrich their programs and to fulfill CORE requirements and electives.

Maryland Study Abroad During the Academic Year

Semester/Year Programs

Study In London: Students take courses through the University of Maryland and the London Metropolitan University. Classes are offered in the humanities, business, social sciences, and sciences. Students live in dorms or in flats with other program participants. Fall or spring semester or year.

Study in Nice, France: Students take courses through the University of Maryland and the University of Nice. Classes are offered in French language, civilization, and literature. Students live in homestays or apartments. Fall or spring semester or year.

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. Fall or spring semester.

Study in Australia: Students take courses at Macquarie University, approximately 20 minutes from Sydney. Classes are offered in most disciplines. Fall or spring semester or year.

Denmark's International Study Program: Students take courses through DIS in Copenhagen. The program 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 or spring semester or year.

Study in Leiden, The Netherlands: Students study at Leiden University. Many courses are offered in English in disciplines such as Dutch language and culture, law and justice, archaeology, Asian studies, biomedical studies, English language and literature, political science and psychology. Fall or spring semester or year.

Exchange Programs

The Study Abroad Office administers reciprocal exchanges with specific universities in **Argentina, Austria, Brazil, England, Germany, Hong Kong, Japan, Korea, and Sweden**. Unlike students on many semester programs, exchange students are directly enrolled as full-time students at the host institution of their choice. Exchange students are expected to be independent and interested in a true immersion experience during their semester abroad. Exchanges are often related to specific academic departments and usually require a language background. All exchanges require at least a 3.0 grade point average. Many exchanges carry full-tuition scholarships.

Exchanges are available with the following universities: In Argentina, a complete curriculum is offered at the Universidad de San Andres. In Austria, students attend the University of Vienna. In Britain, students can study at: University of Kent for government and politics majors; Kingston University for chemistry majors; University of Sheffield for English 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 Brazil, exchange opportunities are available at Pontificia Universidade Catolica or Universidade Federal Fluminense in Rio de Janeiro and at the Universidade Sao Paulo. In Germany, exchanges are available with the University of Tubingen and the Gesamthochschule Kassel. In Hong Kong, students can study at the University of Hong Kong. In Japan, student may study intensive Japanese language at Keio University or Kobe University; language and culture at Rikkyo University; or humanities, social sciences, sciences and engineering at Hiroshima University or Chiba University. In Korea, students can attend Yonsei University or Ewha Women's University. In Sweden, students can study at Uppsala University.

Winter Term

New and exciting programs are offered every year. At the time of printing, Winter Term 2007 programs were being developed. In 2006, the following Winter Term programs were offered:

Argentina: "Anthropological Fieldwork and Experiences"

"Anthropological Fieldwork and Experiences in Argentina: The Relevance of Context and Place" (ANTH 468Q, ANTH 688Q, HONR 348E; 3-credits) exposes students to the work developed by anthropologists in Argentina and to regional varieties in anthropological practice by spending one week at three selected sites of anthropological production.

Argentina: "The Politics of Globalization"

"Politics of Globalization" (SOCY 498W/LASC 458A; 3 credits) will evaluate questions of development through discussion seminars and targeted field trips in various cities. Students will visit with representatives of multilateral institutions, state agencies and nongovernmental organizations to explore the extent to which a new emerging consensus on poverty and inequality is likely to advance the construction of democracy and social equity in the hemisphere.

Belize: "Mayan Culture & the Interface between Rainforests and Coral Reefs"

"Mayan Culture and the Interface between Tropical Rainforests and Coral Reefs" (BIOL 288; 2-credits) is divided into two parts. The first part will introduce students to present-day archeological sites that have been discovered recently and which are defined as some of the major sites of the Mayan culture. The second part will center on the tropical environment of Belize, which is home to rainforests and the second largest barrier reef in the world.

China/Vietnam: "The Value of Water – Culture and Sustainable Development"

"The Value of Water: Culture and Sustainable Development" (GVPT 389A, WORLD 318D, GVPT 888; 3 credits) explores the countries' internal and transboundary challenges and opportunities, focusing on the roles of women and nongovernmental organizations in sustainable development.

With the two fastest growing economies in Asia, the countries face challenges to make their economies, infrastructure, and societies sustainable.

Costa Rica: “Exploring Society and Culture through Service-Learning”

“Exploring Society and Culture through Service Learning” (WRDL 318C; 3 credits) will encourage students to explore issues and ideas of “diversity,” global society, “multiculturalism,” and power in the context of Costa Rican and Central American society and culture. Critical thinking and reflection, key components of service learning, are incorporated into this course through discussion sessions and writing workshops.

Costa Rica: “Sustainable Tropical Ecosystems”

Sustainable Tropical Ecosystems (NRSL 499C, HONR 379K; 2 or 3 credits) is developed and taught jointly by UMD and the University of Costa Rica. Students will be introduced to tropical ecosystems and the people of Costa Rica, explore environmental consequences and the role of sustainability in tropical agricultural development and be familiarized with the concepts of ecotourism.

England: “London – Media with an Accent”

The purpose of “Scholars in London II: The Media and the Arts” (CPSP 379L, JOUR 459; 3 credits), conducted in both College Park and London, is to examine British print and broadcast media and compare it with media in the U.S. Students will explore the socio-economic, cultural, historical, and political influences on media development in both Britain and the U.S., and will analyze their impact on each country’s media laws, patterns of ownership and regulation, and mechanisms of delivery, as well as the nature and content of available media products.

France: “Montpellier - French Language and Culture on the Mediterranean”

“Maryland in Montpellier: French Language and Culture on the Mediterranean” (FREN 204 or 311; 3 credits) is designed for students with intermediate competence and combines classroom work, extracurricular excursions, and a family stay. The goals of the program are to continue language learning in an intensive format, to familiarize students with an area of France that has been romanticized in the American psyche, and to strengthen students’ cross-cultural knowledge and sensibility.

Germany: “Germany in the New Europe”

“Germany and the New Europe: Politics, Business and Culture” (GVPT 388T, BMGT 398B; 3-credits) focuses on modern German politics, business, and culture. The course is sponsored by the Robert H. Smith School of Business and the Department of Government and Politics. Through lectures, readings, and field visits, students 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.

India: “Understanding India”

“Understanding India” (HONR 2680; 3 Credits) is an interdisciplinary course in art, architecture, religion, and cultural history. It focuses on North India, surveying religious traditions and sites of historical importance. Students will do some preparatory work before departure, selecting an area of study and reading about it. They will continue to investigate their chosen subject area on tour.

Ireland: “Civil Society and the Peace Process”

“Civil Society and the Peace Process” (BSOS 388V; 2 credits) introduces students to civil society and the peace process in the Republic of Ireland and Northern Ireland. By working with faculty and students at universities in Galway City, Belfast, and Dublin through community service learning, participants will learn directly about how civil society shapes the future of Ireland.

Italy: “Culture, Heritage and Economy”

The course “Culture, Heritage and Economy” (ANTH 4480, ECON 314, HONR 328R; 3 credits) stresses the interplay of culture, society, and economic life. In particular, it examines how our understanding of our cultural heritage influences our concept of ourselves, with the rich heritage of Italy serving to illustrate this process. Participants will visit, Ascea, Velia, Paestum, Pompeii, Stabia, Naples, Rome and Florence.

Italy: “Ancient Greek and Roman Heritage in Context”

“Classical Foundations: Ancient Greek and Roman Culture in Context” (Classics 100; 3-credits) will explore Greek and Roman classical antiquity. Students will visit Greek temples, Ancient Roman cities, Mediterranean islands, see great works of art and sample incredible food. Participants will also explore classical sites such as Rome, Pompeii, Herculaneum, Oplontis, Paestrum, Naples, and Florence.

Italy: “Genoa - Italian Language and Culture”

UMD, in collaboration with the Consortium University of Genoa, offers “Italian Language and Culture” (ITAL 101, ITAL 102; 4-credits), located at the Centro Internazionale di Studi Italiani in Genoa, Italy. The goal is to provide students

total immersion in the language and culture of Italy. This communicative and totally interactive approach creates a more rapid and effective language acquisition process, while broadening cultural awareness.

Japan: “A View from the Performing Arts”

“A View from the Performing Arts” (HONR 379J, JAPN 499J, THET 499J; 3 credits) is divided into two parts. Students will spend the first few days on campus, studying the major genres of the performing arts and important sites that relate to the repertory in Japan. The class will then travel to Japan to gain personal insight into the community and craft of performing arts. They will also have the chance to reflect upon individual and group interactions in Japanese society.

Korea: “Transformation of Korean Society – Gender, Culture and Political Economy”

“Transformation of Korean Society: Gender, Culture and Political Economy” (WMST 498A, ANTH 468K, SOCY 398B; 3 credits) examines the intersection of gender, culture and political economy in contemporary Korean society through first hand experiences. The main question that is explored throughout the course is what kind of modern, industrial society South Korea is becoming as a consequence of all these rapid economic and social changes.

Lesotho/South Africa: “World Issues - Post-Apartheid Access”

“Exploring World Issues: South Africa and Lesotho” (WRDL 318A; 3 credits) will examine post apartheid access to many South Africa’s major structures and the implications of such access to its neighboring country of Lesotho. (i.e. education, economy, politics, health, arts and culture)

Mexico: “Cultural Competence in Human Services”

“Cultural Competence in Human Services: A Mexican Immersion Experience” (FMST 498C, FMST 698C; 3-credits) will provide students with an intensive immersion experience and structured opportunities to acquire cultural competence in working with and communicating with Spanish-speaking clients. Participants will take field visits and have opportunities to conduct interviews at government and non-profit agencies to understand their goals, organizational structure, and professional practices.

Netherlands: “Maastricht - International and Multi-Cultural Perspectives on Education”

“Maastricht: International and Multicultural Perspectives in Europe” (HONR 248D, EDCI 368B; 3-credits) will focus on the study of multicultural perspectives and international education issues both in America and other parts of the world. The course will begin with a week of coursework in College Park and then students will spend the last two weeks in The Netherlands, with Maastricht as the home base and a visit to Amsterdam.

Spain: “Cultures of the “Contact Zone” – Seville, Al-Andalus and the Atlantic World”

“Cultures of the Contact Zone: Seville, Al-Andalus, and the Atlantic World” (SPAN 225; 3 credits) explores the Mediterranean and the Transatlantic contexts that have influenced and shaped Spain’s history, identity, cultural and artistic expressions. Particular attention will be paid to the so-called convivencia period, when Jews, Muslims, and Christians co-existed in medieval Spain and the repercussions of such legacy. The course will also look at the flourishing of the Spanish empire, its expansion and how this process changed forever the Old World.

Summer Programs

New and exciting programs are offered every year. In 2006, the following summer programs were offered:

Argentina, Brazil, and Uruguay: “The New Politics of Globalization: Democratization & Civil Society Activism in Argentina, Brazil, and Uruguay”

This two month study abroad course (6 Credits) examines and compares the contemporary politics of globalization and democratization in Argentina, Brazil, and Uruguay first-hand. Students will participate in field visits and exchanges with relevant local actors to probe the significant similarities and differences between these South American nations which form the cores of the MERCOSUR project for regional political and economic integration, and are among the principal interlocutors of the United States in negotiating a Free-Trade Area of the Americas (FTAA).

Belgium and France: Monuments of War, Sites of Peace: European Archaeological Heritage.

“Monuments of War, Sites of Peace: European Archaeological Heritage” (ANTH 298E/448E, HONR248J and CPSP379; 3 Credits) surveys the rich and varied archaeological and historic heritage of Flanders and Northern France. In two weeks of study and travel in the heart of Europe, students will have the opportunity to uncover the past themselves, and to learn about how present day research, interpretation, and tourism development affect the ways the past is preserved and presented to the public.

156 Study Abroad Programs

Brazil: “Peoples and Cultures of Brazil: Issues in Social and Environmental Conservation”

“Peoples and Cultures of Brazil: Issues in Social and Environmental Conservation” (6 credits, TBD) provides students with a glimpse of the rich cultural and landscape diversity of Brazil while it also invites participants to consider important implications of cultural and environmental preservation. During the three and a half week program, students will visit two unique sites, an indigenous reservation and a colonial city.

Ecuador: The Galapagos: “A Close Encounter with Nature at the Interface of Geology and Evolution”

Evolution” (GEOL 388; 3 credits) is divided into three parts with the Galapagos islands tour as the core. For the first part, students will meet for a series of 10 classes on campus covering major aspects of Galapagos Zoology, Botany, Geology, Ecology, Evolutionary Biology, and human issues. The second part of the course is the cruise. Students spend eight days visiting the Galapagos. A typical day involves two stops, which may involve either hiking or snorkeling. Destinations include the islands of San Cristóbal, Española, Santa Fe, Plazas, Santa Cruz, Rábida, Santiago, Isabela, Fernandina, Bartolomé, North Seymour. The itinerary also includes the Charles Darwin Research Station on Santa Cruz. In the final part, the group spends a day touring Quito, which arguably containing the world's finest Spanish colonial architecture.

England: “Honors Study Abroad”

“Honors Study Abroad: British History, Literature and Culture in London” (3 credits) is an intense 3-week examination of British Culture on the ground, 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.

England: “Oxford - Honors Programme in Law, History, Politics and Society at Oxford University”

Oxford: “Honors Programme in Law, History, Politics and Society” (4 credits) offers an in-depth look at British law, politics, and society. During the three-week program, students will have the opportunity for concentrated study in small seminar groups, taught by Oxford University faculty members. A general lecture series by prominent figures from the University of Oxford and elsewhere will also be offered. The program will allow students to take two course modules: one required two-credit course in “Law and Society” and one two-credit course of the student's choosing.

England: “London – Sport and Culture in the Global Marketplace”

London: “Sport & Culture in the Global Marketplace” (KNES 389A, KNES 689J; 3 credits) is intended to provide advanced undergraduate and graduate students who are interested in international business, popular culture, sport and tourism, with first hand experience in, and a thorough understanding of, the rapidly expanding global sport marketplace. Particular emphasis is placed upon the manner in which British sport has become an important and instructive site at which globalizing and localizing forces intersect.

France: “Montpellier – French Language and Culture on the Mediterranean”

Montpellier – French Language and Culture on the Mediterranean (FREN 204, FREN311; 3 credits) is a three-week immersion program that combines classroom work, extracurricular excursions, and a family stay. The three principle aims of the experience are to continue language learning in an intensive format, familiarize students with an area of France that has been romanticized in the American psyche, and strengthen students' cross-cultural knowledge and sensitivity. The program is designed for students with intermediate competence in French.

France: “Paris – Classical Myths in Europe”

“Paris: Classical Myths in Europe” (CLAS170; 1 credit) explores the French capital with special attention to its classical heritage and to the “recycling” of classical myths in the art and public discourse of France. Paris, one of the world's most beautiful cities, is high on most people's lists of places to visit at least once in a lifetime. Everyone has heard of the Eiffel Tower, the Louvre, and the Champs-Élysées (named for the Elysian Fields of Greek myth). Less widely known is the fact that Paris holds treasures of classical Greek and Roman art. What's more, much French art from all periods up to the present draws its inspiration from the classical tradition, including the classical myths.

France: “Inside French Theatre – Acting and Movement Training”

Paris: “Inside French Theatre: Acting and Movement Training at Friches Théâtre Urbain” (THET 386; 6 credits) is open to all students with permission of the instructor. It offers the unique opportunity to experience French theatre from the inside while creating several short performances with French theatre professionals. American students will study the performance techniques of Jacques Lecoq and experience how the training

is applied and expanded at Friches Théâtre Urbain, a thriving professional street theatre using movement, acrobatics, improvisation, and stilts. This is the only summer program of its kind offered to study abroad students from the United States.

Germany: “German Language in Tübingen”

The University of Maryland, Department of Germanic Studies, in cooperation with the Eberhard-Karls-University of Tübingen, Germany conducts a four-week intensive language and culture program in August (6 credits). The International Summer University program at Tübingen attracts about 200 participants worldwide to study German language and culture. In addition to the academic program, the International Summer University offers a variety of activities throughout the state of Baden-Württemberg in order for students to obtain a vivid impression of German history, culture and contemporary issues.

Greece: “The Living Legacy”

“Greece: The Living Legacy” (CLAS 308G) is a 3-credit course. Experience the vital energy that produced the classical masterpieces of ancient Greece in the beauty of their native setting: cloud-capped mountains where gods supped on nectar and ambrosia, sparkling blue seas dotted with thousands of islands, landscapes full of mythical echoes. Travel and study in Greece in June 2006, and you will relive the glories of the classical and Byzantine past while savoring the vibrant life of a modern European nation with its sparkling, new, Olympic look.

Ireland: “Exploring Literature for Children and Youth in Relation to Art and Culture”

Ireland: “Exploring Literature for Children and Youth in Relation to Art and Culture” is a 3 credit course. This ancient Celtic land of poets and storytellers is an ideal site to explore literature as it relates to a society. Due largely to its location, Ireland has retained unique cultural traditions and architectural treasures stretching back to the Bronze Age, and further. By examining the customs, beliefs, and experiences of the Irish people, students will understand ways that a culture shapes its literature. Students will gain insight into their own world and will learn about perspectives of other peoples.

Italy: “Genoa – Italian Language and Culture”

Genoa: “Italian Language and Culture” (ITAL103; 4 credits; or ITAL 497; 3 credits) is intended for students who want a total immersion experience in the language and culture of Italy. The aim of the program is to provide students in the accelerated sequence with the opportunity for a total immersion experience in the language and culture of Italy. Through studying language abroad, a communicative and totally interactive approach will contribute significantly to help students of Italian to progress more rapidly and effectively in the language acquisition process, while broadening their view of the world and increasing their cultural awareness.

Italy: “Architectural Identity, Place Making and Town Planning”

Italy: “Architectural Identity, Place Making and Town Planning” (LARC 489A, HONR 338A; 3 Credits) offers students the opportunity to investigate Italy through architecture, public piazzas, and historical town planning. Students will communicate, through one of several methods, their observations, reactions and knowledge of the sites visited throughout Italy. Each student will communicate through either sketching, photography or writing and be responsible for researching and presenting one specific subject. In addition, students will be instructed in a one-hour daily lesson in conversational Italian.

Jamaica: “Ethnographic Fieldwork: Connections, Celebration, and Identity”

Jamaica: “Ethnographic Fieldwork: Connections, Celebration, and Identity” (ANTH 498W /ANTH 698W, 6 credits) is organized around Emancipation Day and Independence Day festivities in Jamaica West Indies, one week of national celebration, and the major period of homecoming for Jamaicans living abroad. The course offers students the opportunity to learn or enhance their ethnographic research skills in observation and participant-observation and various methods of ethnographic interviewing (e.g., informal, semistructured, in-depth, and focus group interviews), by focusing on these homecomings, and the motivations for such returns. The course assumes that a primary motivation is related to the pull of family, friends, and nation, and the sense of home, and celebration. Students will be trained to explore these assumptions ethnographically.

Mexico: “Taxco –Spanish Language”

The University of Maryland System, (UMS) in collaboration with the Centro de Extranjeros (CEPE) of the Universidad Autónoma de México (UNAM), offers an intensive Spanish language program in Taxco, Mexico, that is open to university students as well as to teachers of Spanish (6 credits). Applicants should have completed elementary Spanish (SPAN 101).

Puerto Rico: "The Geography of Puerto Rico"

GEOG 328/HONR 379M (3 credits) is a hands-on, regional geography field course, taught in English. Following in the rich tradition of Juan Ponce DeLeón, Puerto Rico's famous explorer, students who take this course will become explorers themselves as they spend 2 preparation days on campus and 11 days in Puerto Rico studying the physical and human geography of the island.

Spain: "Salamanca and Barcelona"

"Salamanca & Barcelona" (SPAN326 and SPAN311/312 or SPAN408X; 6 credits) seeks to develop the Spanish language proficiency and 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 surrounding countryside.

Western Europe: "HIV/AIDS in Western Europe"

DIS, in cooperation with the University of Maryland, is continuing an innovative, six-week, six-credit summer program on HIV/AIDS in Western Europe (BSCI 279). During the first three weeks students will study in Copenhagen. In the second part of the program, students will embark on a 3-week study tour to London, Paris and Amsterdam. Students are obligated to enroll in both courses.

PRE-PROFESSIONAL ADVISING AND PROGRAMS

Pre-Law, Pre-Medicine, Pre-Dentistry, Pre-Veterinary Medicine, and Other Pre-Allied Health Programs

Division of Letters and Sciences**Law and Health Professions Advising**

Law and Health Professions Advising
0110 Hornbake Library, 301-405-2793
www.ltsc.umd.edu/lawhealth.html

Pre-Professional Advising and Programs

The Law and Health Professions Advising Office (LHPAO), part of the Division of Letters and Sciences, serves students interested in pursuing careers in Law, Allied-Health, or Medicine/Dentistry. The Office maintains limited information for pre-veterinary medicine programs and also encourages students interested in the veterinary profession to visit the Center for Public and Corporate Veterinary Medicine.

Advisors and staff in the LHPAO provide students with assistance with pre-professional planning, including individual and group advising, career preparation workshops, admission information for professional programs, and much more. Pre-professional program advising provides the academic and experiential foundations required for entrance into professional schools. Students may not declare pre-professional programs as the official undergraduate major. While Professional schools do not require, favor, or prefer specific majors, the pre-professional advisors can provide guidance concerning the choice of major. Undecided students may enter the Division of Letters and Sciences, but must adhere to the University of Maryland policy, that students declare a degree-granting major by the time they reach 60 credits.

Health Professions Resource Library (for pre-professional students)

This library offers helpful resources in addition to information available from the individual professional associations mentioned under the programs described below. Located in the LHPAO, 0110 Hornbake, library resources include professional school catalogs and CDs, testing information and preparation materials. LHPAO staff encourages students to review information on careers and professional schools across the country.

Pre-Law**Four-Year Baccalaureate Program**

Most law schools require applicants to have received a Bachelor's degree. No specific major is required. A wide variety of majors give students excellent preparation for law school. The bachelor's degree student will choose a major and plan an undergraduate experience in which they will be successful and that helps them acquire skills that are essential in preparing to perform well on the LSAT, in law school, 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.

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 the student's undergraduate institution. The Law School Admission Council maintains information on admissions and LSAT testing: www.lsac.org.

Three-year Arts/Law Degree

The University of Maryland, College Park has cooperative agreements with the University of Maryland, School of Law and with the University of Baltimore Law School. These agreements provide students at College Park, who are enrolled in any recognized major and meet certain qualifications, with the opportunity to enter law school one year early. The Three-year Arts/Law Degree Program serves students with exceptional records who are accepted to the aforementioned law schools following their third year of baccalaureate-level course work. The University of Maryland, College Park awards these students the baccalaureate degree in Arts/Law upon satisfactory completion of the first year in law school. Participation in the combined degree program at the University of Maryland does not guarantee admission to either of the aforementioned law schools.

This accelerated plan is only available with Maryland System schools and may not be an appropriate choice for all students. Students, who consider this program, should contact the pre-law advisor for more information. Detailed information is also available on the LHPAO website.

Pre-Medicine (Allopathic, Osteopathic, Optometry and Podiatry)

Four-Year Baccalaureate Program

It is preferred that pre-medical students at the University of Maryland 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. The four-year student will plan an undergraduate experience that includes courses to satisfy their selected major and pre-medical admission requirements. Students should seek pre-medical advising early in order to create an appropriate four-year pre-medical plan. The library area of LHPAO and the LHPAO website each provide specific information on each of the medical programs. The national associations: AAMC, www.aamc.org and AACOM, aacom.org provide current information for applicants.

Early Assurance Program

University of Maryland pre-medical students have an opportunity to apply to The George Washington University School of Medicine's Early Assurance Program. This program encourages talented and committed undergraduate sophomore students, who have achieved academic distinction, to gain a provisional early acceptance to the M.D. program. The George Washington University School of Medicine and Health Sciences makes the decision to accept a qualified student into the program. Selected sophomore students (rising juniors, when selected) 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 M.D. degree program. Please visit LHPAO to learn more about this program; the pre-medical website offers detailed information and specific instructions.

Pre-Dentistry

The pre-professional program for pre-dental students provides advising for students preparing to apply to dental school. The recommendations of American dental schools and the requirements for a baccalaureate degree at the University of Maryland form the basis for the advising.

Four-Year Baccalaureate Program

Pre-dental students at the University of Maryland are encouraged to complete a four-year undergraduate degree, with a diversified curriculum, balancing humanities, social sciences and fine arts courses with science and mathematics courses, prior to entering dental school. Courses in which students work with their hands are also advised. Students in the four-year program, must plan an undergraduate experience that satisfies the requirements of their selected major, as well as pre-dental admission requirements. Students should seek pre-dental advising early in order to create an appropriate four-year pre-dental plan. The national associations: AAMC, www.aamc.org and AACOM, www.aacom.org provide current information for applicants.

158 Pre-Professional Advising and Programs

Three-year Arts-Dentistry Degree Program

For highly motivated and academically talented students, the University of Maryland, College Park and University of Maryland School of Dentistry offer the three-year Arts-Dentistry Program. This program gives students the opportunity to apply to the University of Maryland School of Dentistry one year early. This accelerated program requires students to complete their dental school admission requirements in three years, as they apply to dental school at the end of the second year and the beginning of their third year. Competitive students must apply and be accepted by the University of Maryland Dental School. Students, accepted in the combined arts-dentistry program, receive the B.S. degree (Arts-Dentistry) after satisfactory completion of the first year at the dental school and upon the recommendation of the Dean of the School of Dentistry and approval of the University of Maryland, College Park. *Participation in the combined-degree program at the University of Maryland, College Park does not guarantee admission to the University of Maryland School of Dentistry.*

The LHPAO strongly urges incoming students interested in this combined-degree program to identify their interest and consult with the Pre-Health advisor very early in their academic career. Please visit the website for specific details and instruction.

Pre-Dental Hygiene

The Pre-Dental Hygiene program prepares 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 a Pre-Dental major and is not a degree-granting program at the University of Maryland, College Park.* A Baccalaureate degree program for a Bachelor of Science in Dental Hygiene (B.S.-D.H.) follows a 2+2 model. Students may complete two years of prerequisite courses at the University of Maryland, College Park, and then apply for admission into a professional school.

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, the 4+2 model. In this case, students will complete degree requirements in their chosen major, as well as the pre-dental hygiene prerequisites for entrance into a professional dental hygiene program. The institution offering the degree confers a Bachelor of Science in Dental Hygiene upon successful completion of the program.

Prerequisites may change; students are strongly encouraged to contact professional programs for the most current requirements. The American Dental Hygienists' Association and the American Dental Association maintain information about individual B.S.-D.H. program prerequisites. See www.adea.org

Pre-Nursing

The Pre-Nursing program prepares 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 of Science in Nursing (B.S.N.) follows a 2+2 model also known as a "Traditional Baccalaureate" 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 course work, 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 approximately twenty to twenty-five credits of nursing prerequisites. This is the "Second Degree" or "Accelerated Second Degree" model. In this model, students complete degree requirements in their chosen major, as well as the nursing prerequisites for entrance into an accelerated B.S.N. program. The institution offering the program confers a Bachelor of Science in Nursing upon completion of the program.

Prerequisites may change; students are strongly encouraged to contact professional programs for the most current requirements. The American Association of Colleges of Nursing maintains specific information about individual nursing program prerequisites. See www.aacn.edu

Pre-Occupational Therapy

The Pre-Occupational Therapy program prepares students for entrance into a professional curriculum for Occupational Therapy at institutions that offer professional advanced degrees, including master or doctoral degrees. Community colleges and technical schools offer associate degrees or certificates to students who wish to become occupational therapy assistants. Some colleges offer Bachelor degrees in Occupational Therapy, while others offer combined Bachelor and Master degree programs.

Students who wish to enter the occupational therapy profession may choose from several educational paths; they should thoroughly research the different options to determine the best path to their career goals. 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. They may then choose to complete a Post-Bachelor certificate, Master of Science or doctoral degree in Occupational Therapy offered by professional schools. Some states require a degree in occupational therapy prior to approving licensure to work as an occupational therapist in that state. The certificate cannot substitute for a degree. Students should become familiar with the laws of the state(s) in which they wish to work if they choose to pursue a certificate rather than a degree.

Prerequisites may change; students are strongly encouraged to contact professional programs for the most current requirements. The American Occupational Therapy Association maintains specific information about individual program prerequisites. See www.aota.org

Pre-Pharmacy

The Pre-Pharmacy program prepares 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 Pharm.D. degree program follows a 2+4 model in which students 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, a 4 + 4 model. In this model, students complete degree requirements in their chosen major, as well as the pre-pharmacy prerequisites for entrance into a professional pharmacy program. The institution offering the program confers a Pharm.D. degree upon completion of the program.

Prerequisites may change; students are strongly encouraged to contact professional programs for the most current requirements. The American Association of Colleges of Pharmacy maintains information about individual Pharm.D. program prerequisites. See www.aacp.org

Pre-Physical Therapy

The Pre-Physical Therapy program prepares students for entrance into a professional curriculum for Physical Therapy at institutions that offer professional advanced degrees, including master or doctoral degrees. *Pre-Physical Therapy is not a degree-granting program at the University of Maryland, College Park.*

The educational track a student follows in order to obtain a Master of Physical Therapy (M.P.T.) degree varies depending on the professional schools to which the student intends to apply and, 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 M.P.T. Students may enter Master-level professional programs by two routes. By the first route, students complete sixty to ninety credits of prerequisites and then apply to the M.P.T. programs for which they completed the prerequisites. The length of time to complete the Master-level coursework is approximately two to three years. By the second route, students complete a Baccalaureate degree at the University of Maryland, College Park, in addition to the prerequisites required by individual professional schools. Students, choosing this option, complete two to three years of Master-level course work. Either route allows the student to earn an M.P.T. from the professional school the student attends.

Many physical therapy schools now confer doctoral degrees. 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.

Several educational paths exist for students who wish to enter the physical therapy field. Students are encouraged to thoroughly research this profession and determine which educational path best leads to their particular career goals.

Prerequisites may change; students are strongly encouraged to contact professional programs for the most current requirements. The American Physical Therapy Association maintains information about individual program prerequisites. See www.apta.org

Pre-Physician Assistant

The Pre-Physician Assistant (P.A.) program prepares students for entrance into a professional curriculum at institutions that offer professional advanced degrees or post-baccalaureate certificates. *Pre-Physician Assistant is not a degree-granting program at the University of Maryland, College Park.* At the University of Maryland, students may complete the necessary prerequisite courses required by the professional physician assistant programs to which they will be applying.

Several educational paths exist for students who wish to enter the physician assistant field. Due to the many variables in the educational options, students are encouraged to thoroughly research this profession and determine which educational path best leads to their particular career goals. Students should check the particular prerequisites of the P.A. educational programs that interest them.

Prerequisites may change; students are strongly encouraged to contact professional programs for the most current requirements. The American Academy of Physician Assistants maintains information about individual program prerequisites. See www.aapa.org

Other Health Programs:

The pre-biomedical science research and medical technology program prepares 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 degree program for a Bachelor of Science in Medical Technology (B.S.-M.T.) generally follows a 2+2 model. 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, the 4 + 2 model. In this model, students complete degree requirements in their chosen major, as well as the pre-medical technology prerequisites for entrance into a professional medical technology program. The institution offering the program confers a Bachelor of Science in Medical Technology degree on completion of the program.

Prerequisites may change; students are strongly encouraged to contact professional programs for the most current requirements. The American Society of Clinical Pathologists and the National Accrediting Agency for Clinical Laboratory Sciences maintain information about individual B.S.-M.T. program prerequisites.

Student Organizations and Honor Societies

See the web site for a list:

www.ltsc.umd.edu/lawhealth.html

Pre-Veterinary Medicine

Katherine A. Feldman, DMV, MPH, DAC, VPM, Assistant Director
Center for Public and Corporate Veterinary Medicine
301-314-6820
kfeldman@umd.edu

University of Maryland, College Park students in any major may prepare for admission to veterinary school by completing required courses. Students interested in veterinary medicine often enroll in the undergraduate degree programs in the College of Chemical and Life Sciences or the College of Agriculture and Natural Resources. The majority of pre-veterinary students in the College of Agriculture and Natural Resources major in Animal Sciences in the Science/Pre-professional option. Students should consult catalogs from the veterinary schools to which they are interested in applying. American Association of Veterinary Medical Colleges: www.aavmc.org.

Students should seek pre-veterinary advising through the Virginia-Maryland Regional College of Veterinary Medicine, 8075 Greenmead Drive, University of Maryland, College Park, MD 20742-3711, 301-314-6830, kfeldman@umd.edu.

Animal Science/Pre-Veterinary Medicine:

Students enrolled in the College of Agriculture and Natural Resources are eligible for a special degree program that confers a Bachelor of Science degree in Agriculture and Pre-Veterinary Medicine. Students 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 degree. See the Undergraduate Catalog entry for Animal Sciences for more details.

UNDERGRADUATE CERTIFICATE PROGRAMS

African American Studies
Asian American Studies
Computational Science
East Asian Studies
International Agriculture and National Resources
Latin American Studies
Lesbian, Gay, Bisexual and Transgender Studies
Science, Technology and Society
Upper Division Certificate in Secondary Education
Women's Studies

Certificate Program Information and Requirements**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 advisor of the African American Studies Department in 2169 LeFrak Hall. Students pursuing the certificate must meet the University's general education (CORE) and department requirements. See also department listing earlier in this chapter.

Asian American Studies (AAS)

1120 Cole Student Activities Building, 301-405-0996
Interim Director: Timothy J. Ng, Ph.D.
www.aast.umd.edu; aast@umd.edu

The Asian American Studies Program (AAS) provides students with the opportunity to study critically the experiences of Asian Americans. Through an interdisciplinary approach, students examine the histories, communities, and cultures of Asian Americans as both distinctive from and connected to the broader themes of diversity, ethnicity, race, gender, and migration in the Americas. AAS offers an undergraduate certificate for students who wish to develop a specialization in Asian American studies alongside their degree pursuits.

For more information, see Office of Undergraduate Studies in Chapter 6.

Computational Science

College of Computer, Mathematical and Physical Sciences
3103 Mathematics Building, 301-405-0924
Director: Levermore
www.amsc.umd.edu

For program requirements see Certificate in Computational Science in the section on Applied Mathematics and Scientific Computation earlier in this chapter.

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 Director of 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.

160 Undergraduate Certificate Programs

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 upperdivision (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 advisor. 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 advisor 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, mmayo@umd.edu.

International Agriculture and Natural Resources

College of Agricultural and Natural Resources

1104 Symons Hall, 301-405-2078

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

0128B Holzapfel Hall, 301-405-6456

The 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 are additional courses that must 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 advisor for details.

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 204, SPAN 203) or higher. Native speakers of Spanish or Portuguese or students with extensive experience in these languages should consult with the Latin American Studies advisor. Interested students should contact Dr. Eyda Merediz, 2225 Jimenez Hall at emerediz@umd.edu or the LASC Center at 301-405-6459.

Lesbian, Gay, Bisexual and Transgender Studies (LGBT)

1147 Tawes Fine Arts Building, 301-405-5428

Director: Dr. Marilee Lindemann

www.lgbts.umd.edu

The program in Lesbian, Gay, Bisexual and Transgender Studies (LGBT) 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.

For more information, see Office of Undergraduate Studies section in Chapter 6.

Science, Technology and Society Certificate

1108 Chestertown Hall, 301-405-0527

www.sts.umd.edu/certificate

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):

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.

Upper Division Certificate in Secondary Education

College of Education

2311 Benjamin Building, 301-405-3324

www.education.umd.edu/EDCI

See Department of Curriculum and Instruction earlier in this chapter.

Women's Studies Certificate

College of Arts and Humanities

2101 Woods Hall, 301-405-6877

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 I: 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 Society	
WMS4015 Changingal Perceptions of Gender	

162 Minors

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

College of Health and Human Performance

Community Health
Sport Commerce and Culture

In 2004, the University Senate voted to phase out academic citations and replace them with minors. Students currently pursuing an academic citation should contact the respective department or program for information on this conversion process.

MINORS

Students may wish to pursue a Minor in one of the areas of study listed below. Also see Minors in chapter 4. A current list of all minors may be found at: www.provost.umd.edu

A. James Clark School of Engineering

International Engineering
Nanoscience and Technology
Project Management

College of Agriculture and Natural Resources

Agribusiness Economics
Environmental Economics and Policy
Landscape Management
Resource and Agricultural Policy in Economic Development
Soil Science

College of Arts and Humanities

Ancient Greek Language and Literature
Art History
Black Women's Studies
Business Italian
Chinese Language
Chinese Studies
Classical Mythology
English
French Studies
German Language, Literature, and Culture
Italian Language and Culture
Japanese
Jewish Studies
Korean Studies
Latin Language and Literature
Linguistics
Music Performance
Philosophy
Portuguese Language, Literatures, and Cultures
Religious Studies
Rhetoric
Russian Studies
Spanish Language, Business, and Cultures
Spanish Language and Cultures

College of Behavioral and Social Sciences

Black Women's Studies
Geographic Information Science
Hearing and Speech Sciences
International Development and Conflict Management

College of Computer, Mathematical and Physical Sciences

Actuarial Mathematics
Astronomy
Atmospheric Chemistry
Atmospheric Sciences
Computer Science
Earth History
Earth Material Properties
Hydrology
Meteorology
Physics
Statistics
Surficial Geology

College of Education

Secondary Education