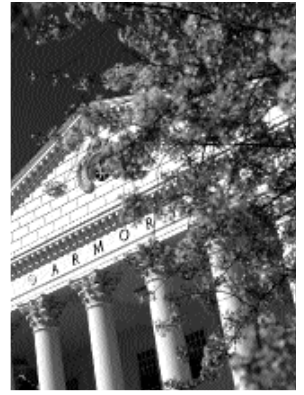


CHAPTER 7

DEPARTMENTS AND CAMPUS-WIDE PROGRAMS



ACCOUNTING

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

AEROSPACE ENGINEERING (ENAE)

A. James Clark School of Engineering

3181 Engineering Classroom Bldg., (301) 405-2376
<http://aerospace.umd.edu>

Chair: Fourney

Professors: Chopra, Lee, Schmidt

Associate Professors: Akin, Baeder, Barlow, Celi, Leishman, Lewis, Vizzini, Wereley, Winkelmann

Assistant Professors: Pines, Sanner

Named Professor: Schmitz

Visiting Professors: Bowden, Korkegi, Spence

Lecturers: Benner, Carpenter, Chen, Cleary, Garrison, Haas, Keller, Lewis, Nelson, Regan, Russell, VanWie, Waltrup

Emeritis: Anderson, Gessow, Jones

The Major

Aerospace engineering is concerned with the physical understanding, analytical techniques, and creative processes required to design aerospace vehicles operating within and beyond planetary atmospheres. Such vehicles range from helicopters and other vertical takeoff aircraft at the low speed end of the flight spectrum to spacecraft operating at thousands of miles per hour during entry into the atmospheres of the Earth and other planets. In between are general aviation and commercial transports flying at speeds well below and close to the speed of sound, and supersonic transports, fighters, and missiles which cruise at many times the speed of sound. Although each speed regime and each vehicle type poses its own special research, analysis, and design problems, each can be addressed by a common set of technical specialties or disciplines.

Major areas include aerodynamics, the study of how airflow produces effects on temperature, forces, and movements; flight dynamics, the study of motion and flight path of vehicles; flight structures, the study of vibration; flight structures, the study of the physical fundamentals of how engines work; and the synthesis of all these principles into one system with a specific application such as a complete transport aircraft, a missile, or a space vehicle through the discipline of aerospace vehicle design.

The Department of Aerospace Engineering has the following educational objectives:

1. Prepare future aerospace who will be successful in their Careers, including industry, government services, 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, in both the aeronautical and 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.
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 facilities of the department include several subsonic wind tunnels with sections ranging from a few inches up to the Glenn L. Martin Wind Tunnel, 7.75-by-11-foot cross-section, which is the best of its class located on a university campus. There is a supersonic tunnel, equipment for the static and dynamic testing of structural components, and a flight simulator. The Alfred Gessow Center for Rotorcraft Education and Research has established some unique experimental facilities to test helicopter models in simulated environments, including an automated model rig and computer-controlled vacuum chamber. The Composite Research Laboratory (CORE) has the facilities necessary for the manufacturing, testing, and inspection of composite materials and structures, including an autoclave, an x-ray machine, and a 220 Kip Uniaxial test machine with hydraulic grips. The Space Systems Laboratory operates the Neutral Buoyancy Research facility for investigating assembly of space structures in a simulated zero gravity environment together with robots and their associated controllers. The department also houses a NASA-funded Center of Excellence in Hypersonic flight, covering research in all aspects of flight in excess of five times the speed of sound. The department's control laboratory is operating the SAMPEX satellite for the NASA Goddard Spaceflight Center. The department's computing facilities include microcomputers, Sun SGI, and HP workstations, and terminals. There is network access to many minicomputers the campus mainframes, several supercomputing centers, and the World Wide Web.

Requirements for Major

Freshman Year	I	II
CHEM 133—General Chemistry.....	4	
PHYS 161—General Physics I.....		3
MATH 140, 141—Calculus I, II.....	4	4
ENES 100—Introduction to Engineering Design.....	3	
ENES 102—Statics.....		2
ENAE 100—The Aerospace Engineering Profession.....	1	
CORE Requirements.....	3	6
Total.....	15	15

Sophomore Year	I	II
MATH 240—Introduction to Linear Algebra.....		4
MATH 241—Calculus III.....	4	
MATH 246—Differential Equations.....		3
PHYS 262, 263—General Physics I & II.....	4	4
ENAE 261—Aerospace Analysis & Computation.....	3	
ENAE 283—Fundamentals of Aeronautical Systems.....	3	
ENES 221—Dynamics.....		3
CORE Requirements.....	3	3
Total.....	17	17

Junior Year	I	II
ENME 232—Thermodynamics.....	3	
ENAE 301—Dynamics of Aerospace Systems.....	3	
ENAE 311—Aerodynamics I.....	3	

80 Afro-American Studies Program

ENAE 324—Aerospace Structures I	3
ENAE 362—Aerospace Instrumentation & Experiments	3
ENAE 432—Control of Aerospace Systems	3
ENES 220—Mechanics of Materials	3
ENGL 393—Technical Writing	3
CORE Requirements	3
AND	
AERONAUTICAL TRACK:	
ENAE 414—Aerodynamics II	3
OR	
SPACE SYSTEMS TRACK:	
ENAE 404—Space Flight Dynamics	3
Total	1515

Senior Year

ENAE 423—Aerospace Structures III	3
ENAE 464—Aerospace Engineering Lab	3
CORE Requirements	3
Aerospace Elective	3
Technical Elective	3
AND	
AERONAUTICAL TRACK:	
ENAE 403—Aircraft Flight Dynamics	3
ENAE 455—Aircraft Propulsion & Power	3
ENAE 481—Principles of Aircraft Design	3
ENAE 482—Aeronautical Systems Design	3
SPACE SYSTEMS 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	1615

Minimum Degree Credits: 123 credits and the fulfillment of all department, college, and university requirements.

The technical elective must be a 300 or 400-level course in Engineering, Mathematics, or Physical Science that has been approved for this purpose by the department.

Admission

See Clark School of Engineering entrance requirements in chapter 6.

Cooperative Program

Participation in the co-op program is encouraged. See Clark School of Engineering entry for details.

Financial Assistance

The department offers several scholarships. Students may obtain information in the main office.

Honors and Awards

The department makes 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. Eligibility criteria are available in the department office.

Student Organizations

The department is home to student chapters of the American Institute of Aeronautics and Astronautics and the American Helicopter Society. Aerospace Engineering students are also frequent participants in student activities of the Society of Automotive Engineers.

Course Code: ENAE

AFRO-AMERICAN STUDIES PROGRAM (AASP)

College of Behavioral and Social Sciences

2169 Lefrak Hall, (301) 405-1158

<http://www.bsos.umd.edu/aasp/>

Director: S. Harley

Professor: R. Walters

Associate Professors: S. Harley, R. Williams, E. Wilson* (GVPT)

Assistant Professors: O. Johnson* (GVPT), F. Wilson

Lecturer: M. Chateauvert

* Joint appointment with unit indicated.

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

Students should consult a departmental adviser for updated information.

Two program options lead to the Bachelor of Arts degree. Both require a 12-credit core of course work that concentrates on Afro-American history and culture.

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

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) and a thesis. 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.

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

	Semester Credit Hours
CORE Liberal Arts and Sciences	43
AASP Foundation Courses: (total 12)	
AASP 100—Introduction to Afro-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
Upper-Division Electives in Afro-American Studies	18

Seminars

AASP 402—Classic Readings in Afro-American Studies	3
AASP 397—Senior Thesis	3

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 or approved courses in other departments; nine credits of upper-division AASP electives in the policy area (AASP numbers 300-400) or, with approval, elective courses outside of AASP; and AASP 397.

	Semester Credit Hours
CORE Liberal Arts and Sciences	43
AASP Foundation Courses: (total 12)	
AASP 100—Introduction to Afro-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

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
 Afro-American Studies.....3
 AASP 305 (Formerly 401)—Theoretical, Methodological
 and Policy Research Issues in Afro 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 Afro-American Studies.....9

Final Option:

AASP 397—Senior Thesis3

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

Honors Program

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

BA/MPM Program

In this innovative joint program, candidates earn a bachelor's degree in Afro-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 Afro-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

82 Aricultural and Resource Economics

AGRICULTURAL AND RESOURCE ECONOMICS (AREC)

College of Agriculture and Natural Resources

2200 Symons Hall, (301) 405-1293

E-mail: arecuinfo@umail.umd.edu

<http://www.arec.umd.edu>

Professor and Chair: Chambers

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

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

Advising

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

Awards

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

Double Majors

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

Requirements for Major

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

Major Core Courses

Seven of these courses must be successfully completed.

AREC 306—Farm Management	3
AREC 404—Prices of Agricultural Products	3
AREC 405—Economics of Agricultural Production	3
AREC 407—Agricultural Finance	3
AREC 414—Agricultural Business Management	3
AREC 427—Economics of Agricultural Marketing Systems	3
AREC 433—Food and Agricultural Policy.....	3
AREC 445—Agricultural Development in the Third World	3
AREC 453—Economics of Natural Resource Use	3
AREC 484—Introduction to Econometrics in Agriculture.....	3

Fields

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

• Business Management

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

• Farm Production

AGRO 101 or HORT 100 – Intro. to Crop Science or Horticulture	4
ANSC 101—Principles of Animal Science	3
ENBE 100—Basic Biological Resources Engineering	3
and	
ENBE 110—Introduction to Biological Resources Engineering.....	3
Three other courses in agronomy, animal sciences, or horticulture, chosen from a list of selected courses.	

• Food Production

PHYS 117 (or PHYS 121) – Introduction to Physics	4
BIOL 105—Principles of Biology	4
NFSC 100—Nutrition	3
NFSC 112—Introduction to Food Science	3
MICB 200—Introduction to Microbiology	4
NFSC 430—Food Microbiology	2
NFSC 431—Food Quality Control	4
NFSC 398—Seminar in Food Science	1

• Environmental and Resource Policy

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

• International Agriculture

ECON 305—Intermediate Macroeconomic Theory and Policy.....	3
ECON 315/146—Economics Development of Underdeveloped Areas	3
ECON 380—Comparative Economic Systems	3
ECON 440/441—International Economics	3
BMGT 392—International Business Management.....	3
One other course in international agricultural production, chosen from a list of selected courses.	

• Political Process

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

• Advanced Degree Preparation

ECON 407—Advanced Macroeconomics	3
ECON 417—Advanced Microeconomics	3
ECON 422—Quantitative Methods in Economics I.....	3
ECON 423—Quantitative Methods in Economics II.....	3
Two other courses in mathematics or mathematical economics, chosen from a list of selected courses.	

• Student Designed Field

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

Course Code: AREC

AGRONOMY (AGRO)

College of Agriculture and Natural Resources

Department of Natural Resource Sciences and Landscape Architecture

2102 Plant Sciences Building

301-405-4351, 301-405-4355

kh26@umail.umd.edu, cw5@umail.umd.edu

<http://www.agnr.umd.edu/users/nrsl/>

Professor and Chair: Weismiller

Professors: Angle, Dernoeden, James, Kenworthy, McIntosh†, Miller, Mulchi, Rabenhorst, Steiner, Weil, Weismiller

Associate Professors: Carroll, Coale, Glenn, Grybauskas, Hill, Ritter, Slaughter, Turner, Vough
 Assistant Professors: Costa, Dzantor
 Adjunct Professors: Lee, Tamboli, Thomas
 Adjunct Associate Professors: Daughtry, Meisinger, Saunders, Van Berkum
 Affiliate Professors: Kratochvil, Terlizzi
 Instructors: Buriel, Steinhilber
 Emeriti: Aycock, Axley, Bandel, Clark, Decker, Fanning, Hoyert, Kuhn, Miller
 †Distinguished Scholar-Teacher

The Major

The Department of Natural Resource Sciences and Landscape Architecture offers five undergraduate majors. Four lead to a bachelor of science (B.S.) degree and one leads to a bachelor of landscape architecture (B.L.A.) degree. See entry on Landscape Architecture later in this chapter.

Agronomy instruction combines the principles of basic sciences with a thorough understanding of plants and soils and environmental sciences. This amalgamation of basic and applied sciences provides the opportunity for careers in conserving soil and water resources, improving environmental quality, increasing crop production to meet the global need for food, and beautifying and conserving the urban landscape using turfgrass.

The agronomy curricula are flexible and allow the student either to concentrate on basic science courses that are needed for graduate work or to select courses that prepare for employment at the bachelor's degree level. Graduates with a bachelor's degree are employed by private corporations as environmental soil scientists, golf course managers, agribusiness company representatives, or by county, state, or federal government as agronomists or extension agents. Students completing graduate programs are prepared for research, teaching, and management positions with industry, international agencies, or federal and state government.

Curriculum in Agronomy

Changes in requirements are under review. Students should check with a departmental adviser for updated information.

CORE Program Requirements (40 semester hours). Math and science requirements (9 hours) are satisfied by departmental requirements.

Requirements (31 semester hours)	Semester Credit Hours
AGRO 101-Introductory Crop Science	4
AGRO 202-Fundamentals of Soil Science	4
AGRO 398-Senior Seminar	1
BIOL 105-Principles of Biology I	4
CHEM 103-General Chemistry I	4
CHEM 104-Fundamentals of Organic and Biochemistry*	4
MATH 110-Introduction to Mathematics OR	
MATH 115-Pre-calculus (consult adviser)	3
PHYS 117-Introduction to Physics OR	
PHYS 121-Fundamentals of Physics I	4
COMM 100-Basic Principles of Speech Communication OR	
COMM 107-Technical Speech Communication	3

*Students intending to take additional chemistry or attend graduate school should substitute CHEM 113, followed by CHEM 233 and CHEM 243.

Crop Science Curriculum

University and Department Requirements	61
AGRO-Advanced Crops Courses (Consult Adviser)	8
AGRO-Advanced Soils Courses (Consult Adviser)	6
BIOL 106-Principles of Biology II	4
PBIO 420-Plant Physiology	4
One of the following:	4
PBIO 250-Plant Taxonomy	
BIOL 222-Principles of Genetics	
PBIO 425-Plant Structure	
Electives	34-35

Turf and Urban Agronomy Curriculum

University and Department Requirements	61
AGRO 305-Introduction to Turf Management	3
AGRO 386-Experiential Learning	3
AGRO 401-Pest Management Strategies for Turfgrass	3
AGRO 402-Sports Turf Management	3
AGRO 410-Commercial Turf Maintenance and Production	3

AGRO 411-Principles of Soil Fertility	3
AGRO 453-Weed Science	3
BIOL 106-Principles of Biology II	4
ENBE 237-Design of Irrigation Systems	1
ENTM 205-Principles of Entomology	4
PBIO 365-Introductory Plant Pathology	4
PBIO 420-Plant Physiology	4
Electives	18-22

Conservation of Soil, Water and Environment Curriculum

University and Department Requirements	61
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Chemistry and Math Requirements	16
MATH 140-Calculus 1 OR	
MATH 220-Elementary Calculus 1	4
CHEM 113-General Chemistry II	4
CHEM 104-Fundamentals of Organic and Biochemistry or	
CHEM 233-Organic Chemistry I	4
GEOL 100 and 110-Physical Geology	4

Applications and Breadth (Select three of the following)	9
AGRO 413-Soil and Water Conservation	3
AGRO 415-Soil Survey and Land Use	3
AGRO 423-Soil-Water Pollution	3
AGRO 444-Remote Sensing	3
AGRO 461-Hydric and Hydromorphic Soils	3

Advanced Soil Science (Select three of the following)	11-14
AGRO 411-Soil Fertility Principles	3
AGRO 414-Soil Morphology, Genesis and Classification	4
AGRO 417-Soil Physics	3
AGRO 421-Soil Chemistry	4
AGRO 422-Soil Microbiology	3
Practical Experience (Select at least 2 credits)	2
AGRO 308-Field Soil Morphology	1-3
AGRO 386-Experiential Learning	3-6

Supporting Courses (Select two of the following)	6-7
AGRO 406-Forage Production	3
AGRO 407-Cereal and Oil Crops	3
AGRO 440-Crops, Soils and Civilization	3
AGRO 441-Sustainable Agriculture	3
AGRO 454-Air and Soil Pollution Effects on Crops	3
GEOL 451-Groundwater Geology	3
GEOL 452-Watershed and Wetland Hydrology	3
GEOL 340-Geomorphology (4) OR	
GEOG 340	3
BIOM 301-Introduction to Biometrics	3
ENBE 234-Principles of Erosion and Water Control and	
ENBE 236-Design of Drainage Systems and	
ENBE 237-Design of Irrigation Systems	3
NRMT 451-Water Quality: Field and Lab Analysis Methods	3
AREC 432-Introduction to Natural Resources Policy	3

Electives	18-24
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Total	120
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Fieldwork and Internship Opportunities

Internships with scientists are available at nearby federal and state agencies.

Student Organizations

Student chapters of the Agronomy Club and Soil Conservation Service provide students with opportunities for professional activities. The department's soil judging team participates in regional and national competitions.

Scholarships

Several scholarships and awards are available to Agronomy students. Contact the Associate Dean's office at (301) 405-2078 for additional information.

Course Code: AGRO

AMERICAN STUDIES (AMST)

College of Arts and Humanities
2125 Taliaferro Hall, (301) 405-1354
<http://www.inform.umd.edu/AMST>

Professor and Chair: Caughey
Professor: Kelly
Associate Professors: Lounsbury, Mintz, Paoletti, Parks, Sies

The Major

American Studies offers an interdisciplinary approach to the study of American culture and society, past and present, with special attention to the ways in which Americans, in different historical or social contexts, make sense of their experience. Emphasizing analysis and synthesis of diverse cultural products, the major provides valuable preparation for graduate training in the professions as well as in business, government, and museum work. Undergraduate majors, with the help of faculty advisers, design a program that includes courses offered by the American Studies faculty, and sequences of courses in the disciplines usually associated with American Studies (i.e., history, literature, sociology, anthropology, art history, and others), or pertinent courses grouped thematically (e.g., Afro-American studies, women's studies, ethnic studies).

Requirements for Major

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

Advising

Departmental advising is mandatory every semester for all majors.

Distribution of the 45 hours

AMST Courses (21 hours required)

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

Core areas outside American Studies (24 hours required)

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

Traditional Disciplinary Cores

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

Interdisciplinary or Thematic Cores

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

Course Code: AMST

ANIMAL SCIENCES (ANSC)

College of Agriculture and Natural Resources
1413 Animal Sciences Center, (301) 405-1373
E-mail: gd38@umail.umd.edu, ld26@umail.umd.edu
<http://www.agnr.umd.edu/users/ansc>

Department of Animal and Avian Sciences

Professor and Acting Chair: Douglass
Professors: Erdman, Kuenzel, Mather, Ottinger, Peters, Russek-Cohen, Soares, Varner, Vijay, Wabeck, Westhoff
Associate Professors: Barao, Doerr, Hartsock, Majeskie, Stricklin, Zimmermann
Assistant Professors: Angel, Dahl, Deuel, Estevez, Kohn, Porter, Rankin, Woods
Emeriti: Flyger, Foster, Heath, King, Leffel, Mattick, Morris, Vandersall, Williams, Young
Adjunct Professors: Glenn, Howard, Oftedal, Paape, Rattner
Extension Associate: Keyser

The Major

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

Requirements for Major

Required of All Students

Semester Credit Hours

CORE Program Requirements*	40
ANSC 101—Principles of Animal Science	3
ANSC 211—Animal Anatomy	4
ANSC 212—Animal Physiology	3
ANSC 215—Comparative Animal Nutrition	3
BIOL 105—Principles of Biology I	4
BIOL 106—Principles of Biology II	4
BIOL 222—Introductory Genetics	4
CHEM 103—General Chemistry I	4
CHEM 104—Fundamentals of Organic and Biochemistry	4
OR	
CHEM 113 and CHEM 233—General Chemistry II and Organic Chemistry I	
MATH 140 OR MATH 220	3
PHYS 121—Fundamentals of Physics	4
OR	
ENBE 100—Basic Agricultural Engineering Techniques	3
ECON 201—Principles of Macroeconomics	4
OR	
AREC 250—Elements of Agricultural and Resource Economics	3
MICB 200—General Microbiology	4
*Includes 16 required credits listed below	

All students must complete 23 or 24 credits of additional course work listed under one of the following areas of specialization:

ANIMAL MANAGEMENT AND INDUSTRY
AVIAN BUSINESS
LABORATORY ANIMAL MANAGEMENT
SCIENCE, PRE-VET

Combined Degree Curriculum: Animal Sciences/Veterinary Medicine

Colleges of Agriculture and Veterinary Medicine

Students enrolled in the College of Agriculture and Natural Resources who have completed at least 90 credit hours, including all university and college requirements, may qualify for the Bachelor of Science degree from the University of Maryland, College of Agriculture and Natural Resources, upon successful completion in an accredited college of veterinary medicine of at least 30 semester hours. It is strongly recommended that students do not

enter this program until their sophomore year and consult with the animal sciences undergraduate program coordinator.

Combined Degree Requirements

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

* Includes 11 required credits listed above

For additional information, please contact the Associate Dean, VMRCVM, 1203 Gudelsky Veterinary Center, University of Maryland, College Park, MD 20742, (301) 935-6083.

Advising

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

Scholarships and Awards

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

Student Organizations

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

Course Code: ANSC

ANTHROPOLOGY (ANTH)

College of Behavioral and Social Sciences

1111 Woods Hall, (301) 405-1423
<http://www.bsos.umd.edu/anth>

Professor and Chair: Leone
 Professors: Agar (emeritus), Chambers, Gonzalez† (emerita), Jackson†, Whitehead, Williams
 Assistant Professors: Freidenberg, Paolisso, Shackel, Stuart
 Research Associates: Blades, Reeves
 Faculty Research Assistants: Buckler, Ernstein, Peterson
 Affiliate Faculty: Bolles (WMST), Caughey (AMST), Harrison (CMLT), Kim (AMST), Robertson (MUSC)
 Adjunct Faculty: Potter (Adjunct Professor, National Park Service), Fiske (Adjunct Professor, NOAA), Kryder-Reid (Adjunct Assistant Professor, National Gallery of Art)
 † Distinguished Scholar-Teacher

The Major

Anthropology, the holistic 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 species has spread over the earth. Anthropology is the science of the biological evolution of human species, and 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 four principal subdivisions of the discipline: cultural anthropology, archaeology, biological anthropology, and linguistics. 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 closely tied to the department’s Master in Applied Anthropology (M.A.A.) program; accordingly, preparation for non-academic employment upon graduation is a primary educational goal of the department’s undergraduate course work and internship and research components.

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

All students have access to a 20-workstation IBM computer laboratory located at 1102 Woods Hall.

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

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—Human Evolution
- ANTH 340—Method and Theory in Archaeology
- ANTH 360—Method and Theory in Sociocultural Anthropology

Quantitative Methods or Foreign Language Requirement:

- A) a quantitative methods course: 3 credit hours required—for a list of classes recommended for this requirement, see the Director for Undergraduate Studies; or
- B) Three or more terms of a foreign language, depending upon proficiency. Proficiency may be demonstrated in one of the following ways:

86 Applied Mathematics Program

- 1) successful completion of high-school level 4 in one language, or
- 2) successful completion of a 12-credit sequence or of the intermediate level in college language courses, or
- 3) successful completion of a placement examination at the above levels in one of the campus language departments offering such examinations

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

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

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

Advising

Undergraduate advising is coordinated by the director of undergraduate studies who serves as the administrative adviser for all undergraduate majors and minors. All majors are required to meet with the director of undergraduate studies at least once per term, at the time of early registration. In addition, the Anthropology department encourages students to select an academic adviser who will work closely with the student to tailor the program to fit the student's particular interests and needs. All Anthropology faculty members serve as academic advisers (and should be contacted individually). Each major is expected to select an academic adviser from the faculty in the field of his/her concentration (Biological Anthropology, Socio-Cultural Anthropology, or Archaeology), and to consult with him/her on a regular basis. The student's choice of a quantitative methods course must be approved by the student's adviser. For additional information, students should contact the Director of Undergraduate Studies, Dr. William Taft Stuart, 0106 Woods Hall, (301) 405-1435; E-mail: wstuart@bss1.umd.edu.

Honors

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

Student Organizations

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

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

Course Code: ANTH

APPLIED MATHEMATICS PROGRAM

College of Computer, Mathematical and Physical Sciences

1104 Mathematics, (301) 405-5062

<http://www.math.umd.edu/mapl>

Director: Kellogg

Faculty: More than 100 members from 13 units.

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

Course Code: MAPL

ARCHITECTURE

For information, see the School of Architecture 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

<http://www.inform.umd.edu/ARHU/Depts/Art>

Chair: Ruppert

Undergraduate Director: Kehoe

Graduate Director: McCarty

Professor Emerita: Truitt†

Professor Emeritus: Driskell††

Professors: DeMonte†, Fabiano, Lapinski, Pogue

Associate Professors: Craig, Forbes, Gelman, Gips*, Humphrey, Kehoe,

Klank, Lozner, McCarty, Richardson, Ruppert, Sham, Thorpe

Instructor: Jacobs

Part Time: Tacha

†Distinguished Scholar-Teacher

††Distinguished University Professor

* Gallery Director

The Major

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

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

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

Requirements for Major

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

Advising

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

Honors Program

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

Fieldwork and Internship Opportunities

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

Scholarships and Awards

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

Student Art Exhibitions

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

Lecture Program

The Art Department 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 the art ideas of women and minorities.

Course Code: ARTT

ART HISTORY AND ARCHAEOLOGY (ARTH)

College of Arts and Humanities

1211B Art/Sociology Building, (301) 405-1479

<http://www.inform.umd.edu:8080/EdRes/Colleges/ARHU/Depts/ArtHistory/>

<http://www.inform.umd.edu/Archaeology>

Professor and Acting Chair: Pressly

Professors: Eyo, Farquhar, Hargrove, Miller, Wheelock

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

Assistant Professors: Gerstel, Gill, Holland, Kita, Sharp

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, Asian art, and feminist perspectives on art. Grounding in art historical and archaeological theory and method is provided in a number of courses. Students are encouraged to supplement their art historical and archaeological studies with courses in other fields. Studies in archaeology may be pursued in cooperation with other University departments. Faculty fieldwork in Greece, Israel, Mexico, Nigeria, and the United States affords undergraduates valuable first-hand experience in archaeological methods and practice.

In addition to the university's excellent libraries, students can use the

resources of the Library of Congress and other major area archives. The department is in the forefront of exploring digital imaging technologies for art historical and archaeological teaching, research, and publication.

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

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

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

Awards

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

Course Code: ARTH

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

College of Arts and Humanities

2106 Jimenez Hall, (301) 405-4239

<http://www.inform.umd.edu/ARHU/Depts/AsianEastEuropean>

Professor and Acting Chair: Ramsey

Professor: Brecht

Adjunct Professor: Li

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

Assistant Professors: Fradkin, Gor, McGinnis, Yotsukura

Instructors: Levy, Miura, Shen, Yaginuma

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

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

Chinese Language and Literature

The Chinese major provides the training and cultural background needed for entering East Asia-related careers in such fields as higher education, the arts, business, government, international relations, agriculture, or the

88 Asian and East European Languages and Cultures

media. Students may also consider a double major in Chinese and another discipline, such as business, government and politics, economics, or journalism.

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

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

Chinese Course Requirements

Language:

CHIN 201—Intermediate Spoken Chinese I (3)
CHIN 202—Intermediate Written Chinese I (3)
CHIN 203—Intermediate Spoken Chinese II (3)
CHIN 204—Intermediate Written Chinese II (3)
CHIN 301—Advanced Chinese I (3)
CHIN 302—Advanced Chinese II (3)

Civilization/History:

Option I:

HIST 284—East Asian Civilization I (3)

and

HIST 481—A History of Modern China (3)

or

HIST 485—History of Chinese Communism (3)

Option II:

HIST 285—East Asian Civilization II (3)

and

HIST 480—History of Traditional China (3)

Electives (300-level or above; 12 credits)

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

Business Option

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

Japanese Language and Literature

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

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

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

Japanese Course Requirements

Language:

JAPN 201—Intermediate Japanese I (6)

JAPN 202—Intermediate Japanese II (6)

JAPN 301—Advanced Japanese I (6)

JAPN 302—Advanced Japanese II (6)

Civilization/History:

Option I:

HIST 284—East Asian Civilization I (3)

and

HIST 483—History of Japan Since 1800 (3)

Option II:

HIST 285—East Asian Civilization II (3)

and

HIST 482—History of Japan to 1800 (3)

Electives (300-level or above; 12 credits)

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

Supporting Courses for Chinese or Japanese

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

Business Option

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

Russian Language and Literature

The undergraduate major in Russian Language and Literature consists of 39 hours beyond the basic language acquisition sequence (RUSS 101, 102, 201, 202). No course grade lower than C may be used to satisfy the major requirements. Two program options lead to the B.A. degree: 1) Russian Language and Literature or 2) Russian Language and Linguistics. A common set of core courses is required of all majors, and each option must be supported by nine hours of related course work. Students may want to consider a double major in Russian language and literature and another discipline, such as business, international relations, economics, or journalism. Russian students have the option of applying to live in St. Mary's Hall (Language House), and the majority of Russian majors participate in a study abroad program.

Russian Course Requirements

Language:

RUSS 210—Structural Description of Russian (3)

or

RUSS 211—Applied Russian Phonetics (3)

RUSS 301—Advanced Russian I (3)

RUSS 302—Advanced Russian II (3)

RUSS 303—Russian Conversation: Functional Skills (3)

RUSS 321—Survey of Russian Literature I (3)

RUSS 322—Survey of Russian Literature II (3)

Supporting Courses (nine hours). LING 200 is required for the Russian language and linguistics option, another literature course is required for the Russian language and literature option; six additional hours chosen in consultation with a departmental adviser. At least six of the nine total hours must be at the 300-400 level.

Specialization (12 hours): all requirements of at least one option must be fulfilled.

a) Russian Language and Literature Option

RUSS 401, 403, 431 or 432, 433 or 434. 409, 439, or SLAV 479 may be substituted for one of 431-434 upon consent of the Undergraduate Adviser.

b) Russian Language and Linguistics Option

479 and three additional courses chosen from among RUSS 410, 411, 412, 473, SLAV 475.

Business Option

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

Summer Programs in the Plekhanov Institute in Moscow or the Moscow Institute of Finance.

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

At present, the department offers two courses in Korean, designed for students who have a speaking knowledge of the language, but who need to learn reading, composition, and aspects of Korean culture related to educated language use.

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

ASTRONOMY (ASTR)

College of Computer, Mathematical, and Physical Sciences

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

E-mail: astrgrad@deans.umd.edu

<http://www.astro.umd.edu>

Chair: Leventhal

Associate Director: Trasco

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

Associate Professors: Harris, Mundy, Stone

Assistant Professors: Hamilton, McGaugh, Ostriker, Veilleux

Adjunct/Part-Time Professors: Holt, Trimble

Professors Emeriti: Bell, Earl, Erickson, Kerr, Wentzel

Instructors: Deming, Theison

Associate Research Scientists: Arnaud, Goodrich, Lopez, McFadden, Milikh, Schmahl, Sharma, White

Assistant Research Scientists: Balachandran, Chen, Golla, Lisse, Livengood, Loewenstien, Madejski

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 upper level astronomy course are also required.

Student 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 adviser, PHYS 161, 262, 263 can be substituted for this sequence. PHYS 374 and two additional 400-level Physics courses are required. Astronomy majors are also required to take a series of supporting courses in mathematics. These are MATH 140, 141, 240, 241 and 246.

The program requires that a grade of C or better be obtained in all courses required for the major. Because of the similarities in the programs, it is relatively easy to obtain a double major in physics and astronomy. This route is strongly recommended for students planning to go on for graduate work in astronomy.

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

Facilities

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

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 adviser 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 recommendations from the faculty. Honors candidates submit a written proposal on their research project and enroll in ASTR 399 for at least 3 credits. In their senior year, students complete a comprehensive oral examination, which concludes the program. Satisfactory grades lead to graduation "with honors (or high honors) in astronomy."

Further information about advising and the Honors Program can be obtained by calling the Department of Astronomy office at (301) 405-3001.

Course Code: ASTR

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: bg4@umail.umd.edu

<http://www.agnr.umd.edu/users/bioreng/>

Chair: Wheaton

Professors: Johnson, Shirmohammadi, Wheaton

Associate Professors: Grant, Kangas, Ross

Assistant Professors: Baldwin, Montas, Schreuders

Emeriti: Brodie, Harris, Krewatch, Merrick, Stewart

The Major

This program is for students who wish to become engineers but who also

90 Biological Sciences Program

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

Emphasis areas include aquacultural engineering, biomedical engineering, plant systems engineering, animal systems engineering, food process engineering, natural resources engineering, and environmental engineering.

Biological Resources Engineering Curriculum

Freshman Year

ENES 100—Introduction to Engineering Design.....	3
*MATH 140—Calculus I.....	4
*CHEM 133—General Chemistry I.....	4
*BIOL 105—Principles of Biology I.....	4
ENBE 110—Intro. to Bio. Res. Engineering.....	1
Total	16
ENES 102—Statics.....	2
*MATH 141—Calculus II.....	4
*CHEM 104—Fundamentals of Organic and Biochemistry.....	4
*PHYS 141—Principles of Physics.....	4
ENGL 101—Introduction to Writing.....	3
Total	17

Sophomore Year

MATH 241—Calculus III.....	4
*MICB 200—General Microbiology.....	4
ENES 220—Mechanics of Materials.....	3
*PHYS 142—Principles of Physics.....	4
Total	15
MATH 246—Differential Equations for Scientists and Engineers.....	3
ENME 232—Thermodynamics.....	3
ENBE 241—Computer Use in Bioresource Engineering.....	3
ZOOL 211—Cell Biology and Physiology.....	4
*CORE ¹	3
Total	16

Junior Year²

ENBE 453—Introduction to Biological Materials.....	3
ENBE 455—Basic Electronic Design.....	3
ENME 331—Fluid Mechanics.....	3
or ENCE 330—Basic Fluid Mechanics	
[ENGR SCI: Technical Elective] ³	3
*CORE ¹	3
Total	15
ECON 201—Principles of Economics.....	3
ENBE 454—Biological Process Engineering.....	4
[BIOL SCI: Technical Elective] ³	3
[ENGR SCI: Technical Elective] ³	3
*CORE ¹	3
Total	16

Senior Year

ENBE 471—Biological Systems Control.....	3
ENBE 422—Water Resources Engineering.....	3
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—Biological Responses to Environmental Stimuli.....	3
ENBE 486—Capstone Design II.....	2
[BIOL SCI or ENGR SCI: Technical Elective] ³	3
*CORE ¹	3
Total	12
TOTAL	123

*Satisfies General Education Requirements

¹Students must consult with an adviser 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 Nuclear Engineering.

Students not qualifying for CHEM 133 must take CHEM 103 and CHEM 113.

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) 405-1198 to schedule an appointment.

Contact departmental academic advisers to arrange teaching or research internships.

Financial Assistance

The department offers two 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 junior and senior 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 the student branch of ASAE, the society for engineering in agricultural, food, and biological systems. Academic advisers will tell you how to become a participant.

Course Code: ENBE

BIOLOGICAL SCIENCES PROGRAM

College of Life Sciences

1213 Symons Hall, (301) 405-6892

Director: Margaret Palmer

Assistant Director: Joelle Presson

The Major

The Biological Sciences major is an interdepartmental program sponsored by the Departments of Entomology, Cell Biology and Molecular Genetics, and Biology. All Biological Sciences majors complete a common sequence of introductory and supporting courses referred to as the Basic Program. In

addition, students must complete an Advanced Program within one of the following specialization areas:

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

A complete list of Specialization Area requirements is available from the Biological Sciences Program Office, (301) 405-6892.

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

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

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

Requirements for Major

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

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

Advising

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

Smith	1126B Microbiology Bldg.	(301) 405-5435	CMBG, MICB
Infantino	2227 Zoo.-Psych. Bldg.	(301) 405-6904	ZOOL, PHNB, MARB, BEES
Barnett	3214 H. J. Patterson Bldg.	(301) 405-1597	PLNT, GENB
Kent	3142 Plant Sciences Bldg.	(301) 405-3911	ENTM, GENB
Presson	1211 Symons Hall	(301) 405-6892	BIVS

Honors

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

Course Code: BIOL, BSCI

BIOLOGY (BIOL)

College of Life Sciences

2227 Zoology-Psychology Building, (301) 405-6904
E-mail: biolugrad@umail.umd.edu

Professor and Chair: Jeffery
Professors: Borgia, Carter-Porges, Colombini, Gill, Palmer, Pierce, Popper, Reaka-Kudla, Sebens, Via, Wilkinson
Associate Professors: Carr, Cohen, Dietz, Dudash, Fenster, Forseth, Goode, Higgins, Imberski, Inouye, Payne, Racusen, Small
Assistant Professors: Davenport, Mueller, Rivas, Sukharev, Tanda
Lecturers: Compton, Infantino, Jensen, Koines, Opoku-Edusei, Perrino
Jointly Appointed Faculty: Costanza, Mount, Poeppel
Professors Emeriti: Anastos, Clark, Corliss, Haley, Highton
Director of Graduate Studies: Pierce
Director of Undergraduate Studies: Infantino

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

Requirements for Specialization

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

Advising

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

Honors

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

Course Code: BSCI

BUSINESS AND MANAGEMENT, GENERAL

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

92 Cell Biology and Molecular Genetics

CELL BIOLOGY AND MOLECULAR GENETICS

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

College of Life Sciences

Microbiology Building, (301) 405-5435
<http://www.life.umd.edu/CBMG>

Chair: Ades

Professors: Bean, Cooke, Dienert†, Ganttt† Joseph, Reveal, Sze, Weiner, Wolniak, Yuan

Associate Professors: Barnett, Benson, Bottino, Hutcheson, Mount, Stein, Straney

Assistant Professors: Chang, Delwiche, DeStefano, Farber, Liu, Pontzer, Song, Stewart

Instructors: Browning, Gdovin, Smith

Professors Emeriti: Cook, Doetsch, Hetrick†, Pelczar, Roberson

Adjunct Assistant Professor: Trun

†Distinguished Scholar-Teacher

††Distinguished University Professor

The Majors

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

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

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

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

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

Requirements for the Specialization Areas

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

Advising

Advising is mandatory. Students are assigned to faculty advisers based upon their area of specialization. The Department of Cell Biology and Molecular Genetics faculty coordinate and advise students who specialize in Microbiology (MICB), Plant Biology (PLNT), and Cell, Molecular Biology, and Genetics (CMBG). Contact the undergraduate program for information. Advising web page: <http://www.life.umd.edu/advising/advisor.htm>. 1219 H.J. Patterson Bldg., Phone: (301) 405-1597.

Research Experience and Internships

Students may gain research experience in off-campus laboratories or in on-campus faculty laboratories. Contact the undergraduate program office, (301) 405-1597, for more information.

Honors and Awards

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

Student Organizations

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

Course codes: MICB, PLNT, CMBG

CHEMICAL ENGINEERING (ENCH)

A. James Clark School of Engineering

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

Professor and Chair: Sengers

Associate Chair and Undergraduate Director: Wang

Associate Chair for Administrative Services: Greer

Director of Graduate Studies: Gentry

Professors: Bentley, Calabrese, Choi, DiMarzio**, Gentry, Greer, McAvoy, Panagiotopoulos, Pereira**, Regan, Sengers, Weigand, Yang**

Associate Professors: Harris, Ranade**, Wang, Zafriou

Assistant Professor: Adomaitis, Ehrman, Pulliam-Holoman

Emeritus: Beckmann, Gomezplata, Smith

**Adjunct

The Major

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

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

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

Requirements for Major

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

	Semester	
Freshman Year:	I	II
ENES 100—Intro to Engineering Design	3	
ENES 102—Statics.....		2
MATH 140—Calculus I.....	4	
MATH 141—Calculus II		4
CHEM 133—Chemistry for Engineers	4	
ENGL 101—Introduction to Writing	3	

PHYS 161—General Physics I	3
CORE Program Requirements	6
Total Credits	14

Sophomore Year

MATH 241—Calculus III	4
MATH 246—Differential Equations for Scientists & Engineers	3
PHYS 262, 263—General Physics	4
ENES 230—Intro. to Materials and their Applications	3
CHEM 233—Organic Chemistry I	4
CHEM 243—Organic Chemistry II	4
ENCH 215—Chem. Engr. Analysis	3
ENCH 250—Computer Methods in Chem.Engineering	3
CORE Program Requirements	3
Total Credits	18

Junior Year

ENCH 300—Chemical Process Thermodynamics	3
ENCH 440—Chemical Engineering Kinetics	3
ENCH 442—Chemical Engr. Systems Analysis	3
CHEM 481, 482—Physical Chemistry I, II	3
CHEM 483—Physical Chemistry Lab I	2
ENCH 422—Transport Processes I	3
ENCH 424 —Transport Processes II.....	3
CORE Program Requirements	3
Total Credits	14

Senior Year

ENCH 437—Chemical Engr. Lab	3
ENCH 444—Process Engr. Economics and Design I	3
ENCH 446—Process Engr. Economics and Design II	3
ENCH 333 —Seminar	1
ENCH 426 —Transport Processes III.....	3
Technical Electives*	3
Science or Technical Elective*	3
CORE Program Requirements	6
Total Credits	15

Minimum Degree Credits: 127 credits and fulfillment of all departmental, school, and university requirements with a cumulative grade point average of 2.0.

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

Technical Electives Guidelines

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

Additional guidelines are as follows:

Technical electives will normally be chosen from the list given. Upon the approval of your adviser and written permission of the department, a limited amount of substitution may be permitted. Substitutes, including ENCH 468 Research (1-3 credits), must fit into an overall plan of study emphasis and ensure that the plan fulfills accreditation design requirements.

Technical Electives**Biochemical Engineering**

ENCH 482—Biochemical Engineering (3)
ENCH 485—Biochemical Engineering Laboratory (3). Recommended only if ENCH 482 is taken.

Polymers

ENCH 490—Introduction to Polymer Science (3)
ENCH 494—Polymer Technology Laboratory (3). Recommended if ENCH 490 is taken.
ENCH 496—Processing of Polymer Materials (3)

Chemical Processing

ENCH 450—Chemical Process Development (3)

Process Analysis and Optimization

ENCH 452 —Advanced Chemical Engineering Analysis (3)
ENCH 453—Applied Mathematics in Chemical Engineering (3)
ENCH 454—Chemical Process Analysis and Optimization (3)

Admission

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

Advising

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

Co-op Program

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

Financial Assistance

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

Honors and Awards

Annual awards are given to recognize scholarship and outstanding service to the department, college and University. These awards include the David Arthur Berman Memorial Award, the Engineering Society of Baltimore Award, and the American Institute of Chemical Engineers Award for the outstanding senior in chemical engineering. AIChE 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 Organization

Students operate a campus student chapter of the professional organization, the American Institute of Chemical Engineers.

Course Code: ENCH

CHEMISTRY AND BIOCHEMISTRY (CHEM, BCHM)**College of Life Sciences**

1320 Chemistry Building, (301) 405-1788
Student Information: 1309 Chemistry Building, (301) 405-1791

Professor and Chair: Jarvist
Associate Chairs: Ammon, Grim
Director, Undergraduate Programs: Berkowitz
Professors: Alexander, Ammon, Bellama, Blough, DeShong†, Greer, Grim, Hansen, Helz, Jarvist†, Khanna, Lorimer, P. Mazzocchi, Mignerey†, G. Miller, Moore, Munn, O'Haver, Thirumalai, Tossell, Walters, Weeks††, Weiner
Associate Professors: Boyd, DeVoe, Eichhorn, Falvey, Julin, Lee, Murphy, Ondov, Reutt-Robey, Rokita, Woodson
Assistant Professors: Arias, Davis, Evans, Forbes, Isaacs, Jollie, Kahn, Morehead, Pilato, Walker
Instructors: D. Mazzocchi, Ebrahimian, Hammond, Rebbert
Emeriti: Freeman, Henery-Logan, Holmlund, Huheey, Jaquith, Kasler, McNesby, Pratt, Sampugna, Stewart, Stuntz, Vanderslice, Veitch
†Distinguished Scholar-Teacher
††Distinguished University Professor

The Majors

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

Chemistry courses for majors in chemistry or biochemistry begin with the two-semester General Chemistry sequence for majors: CHEM 143-153.

94 Civil and Environmental Engineering

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

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

Requirements for Chemistry Majors

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

Each required chemistry course must be passed with a minimum grade of C. Required supporting courses must be passed with a C average.

	Semester Credit Hours
University CORE Requirements	30
College of Life Sciences Core Requirements	5*
Departmental Requirements	41
Supporting Courses	16
Electives	28
Total	120

Requirements for Biochemistry Majors

Departmental requirements for biochemistry majors include 30 credits of specific chemistry courses and BCHM 461, 462, and 464. In addition to the College of Life Sciences Core Requirement of BIOL 105 (4) and BDCP 108-0 (1), biochemistry majors must take two additional approved biological science courses; certain specific courses, as explained by the undergraduate office.

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

	Semester Credit Hours
University CORE Requirements	30
College of Life Sciences Core Requirements	4*
Departmental Requirements	39
Supporting Courses	22
Electives	25
Total	120

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

Advising

Advising is mandatory. Appointments for advising can be made by contacting the secretary in the Office of Undergraduate Studies, Room 1309 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 1403 Chemistry Building. Dr. Boyd (1206 Chemistry Building, 301-405-1805) is the faculty adviser.

Course Codes: CHEM, BCHM

CIVIL AND ENVIRONMENTAL ENGINEERING (ENCE)

A. James Clark School of Engineering

1179 Engineering Classroom Building, (301) 405-1974
<http://www.ence.umd.edu>

Professor and Chair: Baecher
Professors: Aggour, Albrecht, Amde, Ayyub, Birkner, Carter, G. Chang, Colville, Donaldson, Golden (Affiliate), Hao, McCuen, Ragan, Schelling, Schonfeld, Sternberg, Vannoy, Witczak
Associate Professors: Austin, P. Chang, Davis, Goodings, Haghani, Schwartz, Sircar (Affiliate), Torrents
Assistant Professors: Brubaker, Lovell, Moglen, Seagren, Sermons, Tseng

The Major

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

Requirements for Major

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

	Semester Credit Hours	
	I	II
Freshman Year		
MATH 140—Calculus I.....	4	
MATH 141—Calculus II.....		4
CHEM 133—Chemistry for Engineers.....	4	
ENES 100—Introduction to Engineering Design	3	
ENES 102—Statics		2
ENGL 101—Introduction to Writing	3	
PHYS 161—General Physics	3	
CORE Program Requirements	6	
Total	14	15

Sophomore Year

MATH 241—Calculus III	4
MATH 246—Differential Equations for Scientists and Engineers	3
PHYS 262, 263—General Physics II, II	4
ENES 220—Mechanics of Materials	3
ENES 221—Dynamics	3
ENCE 202—Computational Methods in Civil Engineering I	3
ENCE 203—Computational Methods in Civil Engineering II	3
CORE Program Requirements	3
Total	17

Junior Year

ENCE 300—Fundamentals of Engineering Materials OR	3
CHEM 233—Organic Chemistry+	4
ENCE 302—Probability & Statistics for Civil Engineers	3
ENCE 315—Introduction to Environmental Engineering	3
ENCE 320—Construction Engineering and Management	3
ENCE 330—Basic Fluid Mechanics	3
ENCE 340—Fundamentals of Soil Mechanics	3
ENCE 353—Introduction to Structural Analysis or	3
ENCE 355—Introduction to Structural Design++	3
ENCE 370—Fundamentals of Transportation Engineering	3
ENGL 393—Technical Writing	3
CORE Program Requirements	3
Total	15-16

Senior Year

ENCE Technical Electives (Group A, B, C, D, E, F, G, and H)*	9
ENCE 320—Thermodynamics	3
ENCE 466—Design of Civil Engineering Systems	3
CORE Program Requirements	3
Total	15

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

+ Depending on student's 400-level electives, either one or both courses may be needed.

++ Only one structures course is required at the junior level (either ENCE 353 or 355). If student completes both courses, one course will count as the required structures course and the other course will count as an elective.

* See below, Notes Concerning Technical Electives.

Notes Concerning Technical Electives in Civil Engineering

A minimum of 18 credit hours of technical electives are required as follows:

ENCE 4XX—Electives*	3
ENCE 4XX—Electives*	3
ENCE 4XX—Electives**	3
ENCE 4XX—Electives**	3
ENCE 4XX—Electives***	3
ENCE 4XX—Electives***	3

* Two electives from any one category A, B, C, D, E, or F.

** Any two electives from categories A-G.

*** Any two electives from categories A-H, or one technical elective such as CHEM 4XX, or any ENXX 400-level course.

Category A: ENCE 423, ENCE 425

Category B: ENCE 430, ENCE 431, ENCE 432

Category C: ENCE 435, ENCE 436

Category D: ENCE 441, ENCE 442

Category E: ENCE 355, ENCE 454, ENCE 455

Category F: ENCE 470, ENCE 471, ENCE 472

Category G: ENCE 353, ENCE 463, ENCE 465

Category H: ENCE 410, ENCE 420, ENCE 433, ENCE 440,
ENCE 453, ENCE 488, ENCE 489

Admission/Advising

See A. James Clark School of Engineering entrance requirements in chapter 6.

All students are advised by Dr. Bruce Donaldson who assists in course selection and scheduling throughout the student's entire undergraduate program. For advising, contact Dr. Donaldson, (301) 405-1127, 1137 Engineering Classroom Building.

Fieldwork and Internship Opportunities

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

Financial Assistance

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

Honors and Awards

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

Student Organizations

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

Course Code: ENCE

CLASSICS (CLAS)**College of Arts and Humanities**

2407 Marie Mount Hall, (301) 405-2014

E-mail: jh10@umail.umd.edu

<http://www.inform.umd.edu/EdRes/Colleges/ARHU/Depts/Classics>

Professors: Hallett† (Chair), Leshner* (Philosophy)

Associate Professors: Doherty, Lee, Staley, Stehle

Assistant Professor: Rutledge

*Joint Appointment with unit indicated

†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.

Advising

Departmental advising is mandatory for all majors every semester.

Requirements for Major

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

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

Option A: Latin

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

Option B: Greek

Thirty credits of Greek at the 200-level or higher, at least 12 of which must

96 Communication

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

Option C: Greek and Latin

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

Option D: Classics in Translation (Classical Humanities)

Eighteen credits in CLAS courses including CLAS 100 (Classical Foundations) and a senior seminar or thesis; 12 credits in Greek or Latin courses; 12 credits in upper-level supporting courses (normally in Art History, Archaeology, Architecture, Government, History, Linguistics, or Philosophy). Note: 300- and 400-level courses in LATN and GREK may be included among the 18 required hours in CLAS.

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

Course Codes: CLAS, GREK, LATN

COMMUNICATION (COMM) (Formerly Speech Communication)

College of Arts and Humanities

2130 Skinner Building, (301) 405-6519

<http://www.inform.umd.edu/ARHU/Depts/Communication/home.htm>

Professor and Chair: Fink[†]

Professors: J. Grunig, Wolvin

Associate Professors: Gaines, L. Grunig, Klumpp, McCaleb

Assistant Professors: Aldoory, D. Cai, Drake, Garst, Meffert, S. Parry-Giles

Lecturers: Anthony, J. Cai, Eadie, Morrison, T. Parry-Giles, Ritchie, Silver, Waks

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

Affiliate Assistant Professors: Gelfand (PSYC), McDaniel (KNES)

Adjunct Assistant Professor: Maxfield

[†]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, 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.

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.

Requirements for Major

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

1. One course from the following list: COMM 107, 200, or 230.
2. COMM 250, 400, and 401.
3. Completion of one of the following concentrations: Communication Research, Communication Studies, Public Relations, or Rhetoric and Public Discourse.
 - a. Communication Research COMM 402

Five courses from the following: COMM 420, 424, 425, 426, 435, 470, 475, 477, 482. 6 semester hours in COMM at least three of which are at the 300-400 level. One course from the following (Statistical Analysis): PSYC 200, SOCY 201, BMGT 230, EDMS 451 or an equivalent course. One course from the following (Structural Analysis of Language): LING 200, HESP 120, ANTH 380 or an equivalent course. 9 semester hours in courses related to Communication Research in one department other than COMM

b. Communication Studies COMM 402

One course from the following: COMM 420, 424, 425, 426, 435, 470, 475, 477, 482. One course from the following: COMM 330, 360, 450, 451, 453, 455, 460, 461, 469, 471, 476. 15 semester hours in COMM courses at least 12 of which must be at the 300-400 level. One course from the following (Statistical Analysis): PSYC 200, SOCY 201, BMGT 230, EDMS 451 or an equivalent course. One course from the following (Structural Analysis of Language): LING 200, HESP 120, ANTH 380 or an equivalent course. 9 semester hours in courses related to Communication Studies in one department other than COMM

c. Public Relations JOUR 201 and 202; COMM 350, 351, 352, 386, and 483. 3 semester hours in COMM at the 300-400 level

One course from the following (Statistical Analysis): PSYC 200, SOCY 201, BMGT 230, EDMS 451 or an equivalent course. One course from the following (Economics): ECON 200 or 201. 9 semester hours in courses related to Public Relations in one department other than COMM or JOUR

d. Rhetoric and Public Discourse COMM 450

Five courses from the following: COMM 330, 360, 451, 453, 455, 460, 461, 469, 471, 476. 6 semester hours in COMM at least three of which must be at the 300-400 level. One course from the following (Critical Analysis of Discourse): AMST 432, CMLT 488, ENGL 453, JWST 263, PHIL 233. One course from the following (Structural Analysis of Language): LING 200, HESP 120, ANTH 380 or an equivalent course. 9 semester hours in course related to Rhetoric and Public Discourse in one department other than COMM

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

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

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

Course Code: COMM

COMPARATIVE LITERATURE PROGRAM (CMLT)

College of Arts and Humanities

2107 Susquehanna Hall, (301) 405-2853

Core Faculty

Professor and Director: Harrison* (Spanish and Portuguese)

Professors: Berlin* (English and Jewish Studies), Collins* (English), Fuegi,

Hage* (French), Lanser[†]* (English), Lifton, Peterson* (English)

Associate Professors: Marchetti, Wang* (English)

Instructor: Robinson

* Joint appointment with unit indicated

[†] Distinguished Scholar-Teacher

Affiliate Faculty

Professors: Alford, Auchard, Beck, Bedos-Rezak, Bolles, R. Brown, Caramello, Caughey, Chambers, Coogan, Cross, Cypess, Donawerth, Fahnestock, Flieger, Gillespie, Grossman, Hallett, Handelman, Holton, Kauffman, Kelly, Leonardi, Mossman, Pearson, Robertson, M. Smith, Trousdale, Turner

Associate Professors: Barry, Brami, J. Brown, Cate, Doherty, Falvo, Greene-Gantzberg, Igel, Kerkham, King, Kuo, Leinwand, Mintz, Norman, Peres, Ray, Richardson, Sargent, Strauch, Withers, Ziifi

Assistant Professors: Cohen, Sherman, Upton, Williams

The Major

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

Citation in Comparative Studies

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

Course Code: CMLT

COMPUTER ENGINEERING (ENCP)

A. James Clark School of Engineering

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

E-mail: eeadvise@deans.umd.edu

http://www.ee.umd.edu

Chair: Farvardin

Professors: Agrawala, Aloimonos, Basili, Chu (Emeritus), Davis, DeClaris, Edmunson (Emeritus), Elman, Gannon, Gasarch, Gligor, Kanal (Emeritus), Ja'Ja', Ligomenides (Emeritus), Miller, Minker (Emeritus), Nakajima, Nau, O'Leary, Oruc, Perlis, Reggia, Rosenfield, Roussopoulos, Saltz, Samet, Shankar, Shneiderman, Smith, G. W. Stewart, Tripathi, Vishkin, Zerkowicz
Associate Professors: Dorr, Faloutsos, Gerber, Hendler, Kruskal, Khuller, Mount, Porter, Pugh, Pugsley (Emeritus), Purtilo, Silio, Subrahmanian
Assistant Professors: Bederson, Bhattacharyya, Chawathe, M.J. Franklin, M. Franklin, Golubchik, Hollingsworth, Jacob, Keleher, Marculescu, Salem, D. Stewart, Tseng, Yeung

Lecturers: Glenn, Golub, Herman, Kaye, Lin, Plane

The Major

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

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

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

engineering problems;

10. Provide students with an ability to design and conduct experiments, interpret empirical observations and analyze data;
11. Provide students with opportunities to engage in structured research activities;
12. Maintain technological relevance by introducing students to current applications in the field, as well as to state-of-the art laboratory equipment and computer simulation tools;
13. Provide students with a motivation to seek further specialization in the field of computer engineering, and to continue learning, whether in a formal academic setting or through self-instruction.

Requirements for Major

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

	Semester and Credit Hours	
	I	II
First Year		
CORE—General Education		3
CHEM 133—General Chemistry	4	
PHYS 161—General Physics		3
MATH 140, 141—Calculus I, II	4	4
CMSC 114—Computer Science I		4
CMSC 150—Discrete Structures	4	
ENES 100—Intro. to Engr. Design		3
Total Credits	15	14

	I	II
Sophomore Year		
CORE Courses—General Education	3	6
MATH 246—Differential Equations		3
CMSC 214—Computer Science II	4	
CMSC 251—Algorithms		3
PHYS 262—General Physics	4	
ENEE 241—Numerical Techniques	3	
ENEE 204—Basic Circuit Theory		3
ENEE 206—Fundamental Lab		2
ENEE 244—Digital Logic Design		3
Total Credits	17	17

	I	II
Junior Year		
CORE Courses—General Education	3	6
CMSC 330—Organizations of Program Languages		3
CMSC 412—Operating Systems		4
ENEE 302—Digital Electronic Circuits	3	
ENEE 322—Signal and System Theory		3
ENEE 324—Engineering Probability		3
ENEE 350—Computer Organization		3
ENEE 446—Computer Design		3
Total Credits	15	16

	I	II
Senior Year		
CORE Courses—General Education	3	3
Electives*	12	12
Total Credits	15	15

Computer Engineering Electives

- At least six credits must be from the Approved Computer Engineering Course list (three credits must be from a 400-level course);
- 12 credits of engineering topics from the Approved Computer Engineering Course list;
- One course in engineering (cannot be electrical; ENME 320, Thermodynamics, is recommended);
- Four credits of engineering lab coursework from the Approved Computer Engineering Course list;
- One engineering Capstone course
- At least one CMSC and ENEE course from the Approved Computer Engineering Course list.

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

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 EE and CS undergraduate offices, faculty in Computer Engineering function as undergraduate advisers. Departmental approval is required

for registration in all upper-division courses in the major. The department's Undergraduate Office (2429 A.V. Williams Building, 301-405-3685) is the contact point for undergraduate advising questions.

Cooperative Education Program

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

Financial Assistance

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

Job Opportunities

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

Research Labs

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

Student Organizations

Please see listing for ENEE

Courses (see full descriptions in chapter 8)

CMSC 114—Computer Science I (4)
 CMSC 150—Introduction to Discrete Structures (4)
 CMSC 214—Computer Science II (4)
 CMSC 251—Algorithms (3)
 CMSC 330—Organization of Programming Languages (3)
 CMSC 412—Operating Systems (4)
 ENEE 204—Basic Circuit Theory (3)
 ENEE 206—Fundamental Electric and Digital Circuit Laboratory (2)
 ENEE 241—Numerical Techniques in Engineering (3)
 ENEE 244—Digital Logic Design (3)
 ENEE 302—Analog Electronic Circuits (3)
 ENEE 322—Signal and System Theory (3)
 ENEE 324—Engineering Probability (3)
 ENEE 350—Computer Organization (3)
 ENEE 446—Digital Computer Design (3)

Course Codes: ENEE, CMSC

COMPUTER SCIENCE (CMSC)

College of Computer, Mathematical and Physical Sciences

1109 A.V. Williams Building, (301) 405-2672

E-mail: ugrad@cs.umd.edu

<http://www.cs.umd.edu>

Professor and Chair: Gannon†

Professors: Agrawala, Aloimonos, Basili, Davis, Elman, Gasarch, Miller, Nau, O'Leary, Perlis, Reggia, Rosenfeld, Roussopoulos, Saltz, Samet, Shankar, Shneiderman, Smith, Stewart, Tripathi, Zelkowitz

Associate Professors: Dorr, Faloutsos, Gerber, Hendler, Kruskal, Mount, Porter, Pugh, Purtilo, Subrahmanian

Assistant Professors: Bederson, Chawathe, Franklin, Golubchik, Hollingsworth, Keleher, Khuller, Tseng

Instructor: Plane

Lecturers: Glenn, Golub, Herman, Hugue, Kaye, Lin, Padua-Perez

Professors Emeriti: Atchison, Chu, Edmundson, Kanal, Minker

†Distinguished Scholar-Teacher

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.

Requirements for Major

Note: Changes in major requirements are under review. Students should check with a departmental adviser for updated information.

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

- A grade of C or better in the following courses:
 - CMSC 105 or CMSC 106 or an acceptable score on the Pascal Advanced Placement examination or acceptable score on the appropriate Department exemption examination.
 - CMSC 114 or acceptable score on the C++ Advanced Placement examination or acceptable score on the appropriate Department exemption examination.
 - CMSC 150 or an acceptable score on the appropriate Department exemption examination.
 - CMSC 214 or an acceptable score on the appropriate Department exemption examination.
 - At least 24 credit hours at the 300-400 levels, including CMSC 311, CMSC 330 and at least 15 credit hours of the following CMSC courses:
 - Computer Systems: Any two of 411; 412; 417
 - Information Processing: 420; one of 421, 424, 426; or 427
 - Software Engineering/Programming Languages: Any two of 430; 434; 435;
 - Theory of Computation: 451; 452;
 - Numerical Analysis: one of 460 or 466; 467.**Note:** CMSC 451 and 452 require CMSC 251 as an additional prerequisite. Courses in Numerical Analysis require MATH 240 or 241 as additional prerequisites. Students without either of these prerequisites must choose their 15 credit hours from the remaining courses in the other three areas.
- MATH 140 and 141 (or MATH 350 and MATH 351). A STAT course which has MATH 141 (or a more advanced mathematics course) as a prerequisite, and one other MATH, STAT, or MAPL 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.

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

Advising

Computer science majors may obtain advising at room 1109 A.V. Williams Building. Interested students should call (301) 405-2672 to receive further information about the program.

Financial Assistance

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

Honors

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

Student Organizations

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

Course Code: CMSC

COUNSELING AND PERSONNEL SERVICES (EDCP)

College of Education

3214 Benjamin Building, (301) 405-2858

Professor and Chair: Power

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

Associate Professors: Boyd, Clement (Affiliate), Fassinger, Greenberg, Jacoby (Affiliate), Komives, Lawrence, McEwen, Pope-Davis, Scales (Affiliate), Strein, Teglassi, Westbrook (Affiliate)

Assistant Professors: Bagwell (Affiliate), Freeman (Affiliate), Gast (Affiliate), Heath, Holcomb-McCoy, Hrutka (Affiliate), Kandell (Affiliate), Lucas, Mielke (Affiliate), Milam, Osteen (Affiliate), Phillips, Rogers, Schmidt (Affiliate), Stewart (Affiliate), Stimpson (Affiliate), Thomas (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, community/career 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

Distinguished University Professor and Chair: Sherman

Professors: Farrington (Research), Gottfredson, Laub, MacKenzie, Paternoster[†], Reuter, Smith, Wellford

Associate Professors: Russell, Simpson, Taxman (Research), Wish

Assistant Professors: Bass, Brame, Bushway, Li (Research), Tseloni, Wilson (Research)

Lecturers: Chapman, Cosper, Gaston, Johnston, Mauriello, Zumbun

Professor Emeritus: Lejins* (Sociology)

Instructor: Brooks

[†]Distinguished Scholar-Teacher.

*Joint Appointment with unit indicated.

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

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

The Criminology and Criminal Justice Major

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

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

Supporting Sequence	Credit Hours
18 hours (9 hours at 300/400 level)	18
Social Science Statistics.....	3

Total for Major and Supporting51

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

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

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

Internships

Internships are available through CCJS 398 and CCJS 359 in a variety of federal, state, local, and private agencies.

The Maryland State Department of Education (MSDE) now requires that teachers seeking certification for all areas of secondary education must take a total of two reading classes. MSDE is currently working on the required content of these two classes before implementation can begin in the College of Education. These changes may result in additional classes for all undergraduate secondary education majors.

Foreign-Language Requirement, Bachelor of Arts Degree

All students who pursue the Bachelor of Arts degree in secondary education are required to complete two years (12 semester hours) or the equivalent of an intermediate level of a foreign language at the college level. If students have had three years of one foreign language or two years of each of two foreign languages as recorded on their high school transcripts, they are not required to take any foreign languages in the College, although they may elect to do so.

If students are not exempt from the foreign-language requirements, they must complete courses through the 104-level of a modern language or the 204-level of a classical language.

In the modern languages: French, German, and Spanish students should take the placement test in the language in which they have had work if they wish to continue the same language; their language instruction would start at the level indicated by the test. With classical languages, students would start at the level indicated in this catalog.

For students who come under the provisions above, the placement test may also serve as a proficiency test and may be taken by a student any time (once a semester) to try to fulfill the language requirement.

Students who have studied languages other than French, German, or Spanish, or who have lived for two or more years in a foreign country where a language other than English prevails, shall be placed by the chair of the respective language section, if feasible, or by the chairs of the foreign language departments. Native speakers of a foreign language shall satisfy the foreign language requirements by taking 12 semester hours of English.

English Education

Three Options

(Effective Summer, 1995. Students in the current English Education program may elect to complete that program or transfer to one of the three options.)

OPTION I: Double Major: English Education and English

Freshman Year

CORE Program Requirements (13 credits)
 MATH 110—Introduction to Mathematics (3)
 COMM 107—Speech Communication, or COMM 125—Introduction to Interpersonal Communication, or COMM 220—Small Group Discussion (3)
 Foreign Language (Intermediate mastery of a modern or classical language is required) (8 credits)
 ENGL 101—Introduction to Writing or ENGL 101H—Honors Composition (3)
 (If exempt from ENGL 101, majors are required to take ENGL 291—Intermediate Writing or ENGL 294—Introduction to Creative Writing.)

Sophomore Year

CORE Program Requirements (9 credits)
 ENGL 201—World Literature, Homer to the Renaissance or ENGL 202—World Literature, Shakespeare to the Present (3)
 ENGL 301—Critical Methods in the Study of Literature (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 (one of these five courses must be in American Literature):
 a. Medieval Literature
 b. Renaissance Literature other than Shakespeare
 c. Restoration or 18th-Century Literature
 d. 19th-Century British Literature
 e. American Literature before 1900
 f. 20th-Century British or American Literature (15 credits)

LING 200—Introductory Linguistics (3)
 *EDPA 301—Foundations of Education (3)
 EDHD 413 and 420

Junior/Senior Years

CORE Program Requirements (3 credits)
 British and American Literature (remaining requirements)
 COMM 230—Argumentation and Debate or COMM 330—Argumentation in Society or COMM 383—Urban Communication or COMM 402—Communication Theory and Process (3)
 ENGL 384—Concepts of Grammar or ENGL 383—The Uses of Language or ENGL 385—English Semantics or ENGL 482—History of the English Language or ENGL 483—American English or ENGL 484—Advanced English Grammar or ENGL 486—Introduction to Old English or ENGL 489—Special Topics in English Language (3)
 ENGL 304—The Major Works of Shakespeare or ENGL 403—Shakespeare: The Early Works or ENGL 404—Shakespeare: The Late Works (3)
 ENGL 487—Foundations of Rhetoric or COMM 360—The Rhetoric of Black America or COMM 401—Interpreting Strategic Discourse or COMM 453—The Power of Discourse in American Life (3)
 ENGL Elective—Woman or minority course (3)
 ENGL 391—Advanced Composition or ENGL 393—Technical Writing or ENGL 493—Advanced Expository Writing (3)
 *EDCI 390—Principles and Methods of Secondary Instruction (3)
 *EDCI 466—Literature for Adolescents (3)
 *EDCI 463—The Teaching of Reading in the Secondary School (3)
 *EDCI 467—Teaching Writing (3)

Senior Year

ENGL 399—Senior Seminar (3)
 *EDCI 340—Curriculum, Instruction and Observation: English, Speech, Theater Methods (3) (Fall only)
 *EDCI 447—Field Experience in English Teaching (concurrent with EDCI 340) (1)
 *EDCI 441—Student Teaching: English (12)
 *EDCI 440—Student Teaching Seminar in Secondary Education: English (concurrent with EDCI 441) (1)
 *Must be admitted to Professional Education to take these courses.

OPTION II: B.A. Degree in English Education

The B.A. Degree in English Education is an additional route leading to the baccalaureate and certification for teaching secondary English language arts. **The education and English requirements are exactly the same for all three options.**

Option II is primarily for students who have already earned a bachelor's degree. It is also available to students working on their initial degree, but the double major is the recommended option since the requirements for both are identical. In Option II, completion of the English and professional education courses and field experiences will result in the awarding of a B.A. degree in English Education.

OPTION III: Double Degree

Option III is a third route leading to certification for teaching secondary English language arts. It is designed for students who have earned a bachelor's degree in another field (for example, history) and seek secondary teacher certification via a University of Maryland, College Park-approved teacher education program and a second bachelor's degree in English Education (EDCI). In addition to successful completion of the College of Education teacher education admissions requirements listed above, students must apply for admission to the approved teacher education program in secondary English Education. If the student's academic background does not include sufficient course work in composition; introductory and advanced English language and linguistics; rhetoric; world, British, and American literature; literary criticism; and literature by women and minorities, those courses must be part of the course of study leading to completion of the approved teacher education program. In Option III, completion of the English and professional education courses and field experiences will result in the awarding of a B.A. degree in English Education.

Art Education, K-12

Pre-Professional/Subject Area Course Work

Note: Course sequencing is under review.
 ARTT 150—Introduction to Art Theory (3)
 ARTT 100—Elements of Design (3)
 ARTT 110—Elements of Drawing (3)
 COMM 107—Speech Communication or COMM 125 or COMM 220 (3)
 ARTH 200—Art of the Western World I (3)
 ARTH 201—Art of the Western World II (3)
 ARTT 200—Three-Dimensional Art Fundamentals (3)

102 Curriculum and Instruction

ARTT 210—Elements of Drawing II (3)
ARTT 320—Elements of Painting (3)
EDCI 273—Practicum in Ceramics (3) (Spring only)
ARTT 428—Painting II (3)
EDCI 406—Chaos and the Arts (3) (Fall only)
EDCI 407—Practicum in Art Education: Three Dimensional (3) (Spring only)
ARTT 340—ARTT 341—ARTT 342—ARTT 343—Elements of Printmaking: Intaglio (3)

Professional Courses

These requirements are being revised.

EDHD 413—Adolescent Development (3)
EDHD 420—Cognitive Development and Learning (3)
EDCI 390—Principles and Methods of Secondary Education (3)
EDSP 470—Introduction to Special Education (3)
EDCI 403—Teaching of Art Criticism in Public Schools (3) (Spring only)
EDPA 301—Foundations of Education (3)
EDCI 300—Discipline Based Art Education (C&I Art Methods) (3) (Fall only)
EDCI 401—Student Teaching in Elementary Schools: Art (4-8)
EDCI 402—Student Teaching in Secondary Schools: Art (2-8)

Foreign Language Education

The Foreign Language (FL) Education curriculum is designed for prospective foreign language teachers in middle through senior high schools who have been admitted to the EDCI Teacher Education Program. Currently, admission is open to qualified students seeking teacher certification in **Spanish, French, Russian, and German only**.

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 which includes the areas of 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. Students are strongly advised to utilize these nine hours to begin or continue the study of another language as soon as possible after entering the university. The second area of concentration must be approved by a FL adviser and may be in any foreign language regardless of whether it is a Maryland State Department of Education approved FL certification program.

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

Pre-Professional/Subject Area Course Work

COMM 100, 125, or 220—Basic Principles of Speech Communication (3)
Primary FL Area—Intermediate (200 level) (3,3)
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) (3,3)
Primary FL Area—Literature (400-above levels) (3,3)
Primary FL Area—Culture and Civilization (3)
Applied Linguistics (**In the Primary FL Area** if available; otherwise, **LING 200** or ANTH 371)—FL Phonetics **does not** satisfy this requirement). (3)

Electives in FL-Related Courses (9 hours—minimum of three courses). It is **strongly recommended** that these hours be utilized to begin or continue the study of another foreign language as soon as possible.

All 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 adviser.

Professional Courses

EDHD 413—Adolescent Development (3)
EDHD 420—Cognitive Development and Learning (3)
EDPA 301—Foundations of Education (3)
EDCI 390—Principles and Methods of Secondary Education (3)
EDCI 400—Level FL Education Elective only in consultation with FL Education. Adviser (3)
EDCI 330—Curriculum and Instruction in Secondary Education: Foreign Language (3) **Pre-requisites: EDCI 413 and 420 and EDCI 390 (fall only), All Primary FL Area course work**
EDCI 430—Seminar in Student Teaching (3) (Taken **concurrently** with EDCI 431. only) **Pre-requisite: EDCI 330.**
EDCI 431—Student Teaching in the Secondary Schools (12) (Taken **concurrently** with EDCI 430 only). **Pre-requisites: EDCI 330 and 301.**

Mathematics Education

A major in mathematics education requires the completion of MATH 241 or its equivalent, and a minimum of 15 semester hours of mathematics at the 400-level (excluding MATH 490); 400-level courses beyond those prescribed (402 or 403; 430) should be selected in consultation with a mathematics education adviser. The mathematics education major must be supported by one of the following science sequences: CHEM 103 and 113 or CHEM 103 and 104; PHYS 221 and 222 or PHYS 161 and 262 or PHYS 141 and 142; BIOL 105 and 106; ASTR 200 and three additional hours in ASTR (none of which include ASTR 100, 101, 110 or 111). Also CMSC 104, 105, or 106 is required.

Students majoring in mathematics may prepare to teach mathematics by pursuing a special sequence of professional courses in the College of Education. Early contact should be made with either Dr. James Fey or Dr. Duane Cooper.

Pre-Professional/Subject Area Course Work

COMM 107, 125 or 220 (3)
MATH 140, 141—Calculus I, II (4,4)
Science Requirement (7-10) (See above)
MATH 240, 241—Linear Algebra, Calculus III (4,4)
CMSC 104—Introduction to FORTRAN Programming or
CMSC 105—Introduction to Pascal Programming (4,3)
CMSC 106—Introduction to C Programming (4)
MATH 430—Euclidean and Non-Euclidean Geometries (3)
MATH 402—Algebraic Structures or
MATH 403—Introduction to Abstract Algebra (3)
MATH Electives (400-level) (9)

Professional Courses

EDHD 413—Adolescent Development (3)
EDHD 420—Cognitive Development and Learning (3)
EDCI 390—Principles and Methods of Secondary Education (3)
EDCI 350—Curriculum and Instruction in Secondary Education: Mathematics (3) (fall only)
EDCI 355—Field Experience: Secondary Mathematics
EDPA 301—Foundations of Education (3)
EDCI 457—Teaching Secondary Students with Difficulties in Learning Mathematics (3)
EDCI 451—Student Teaching in Secondary Schools: Mathematics (12)
EDCI 450—Student Teaching Seminar in Secondary Education: Mathematics Education (3)

Music Education, K-12

The curriculum in music leads to a Bachelor of Science degree in education with a major in music education. It is planned to meet the demand for specialists, supervisors, and resource teachers in music in the schools. The program provides training in the teaching of general music/choral and instrumental music and leads to certification to teach music at both elementary and secondary school levels in Maryland and most other states. There are two options. The general music/choral option is for students whose principal instrument is voice or piano; the instrumental option is for students whose principal instrument is an orchestral or band instrument. Students are able to develop proficiency in both options by taking additional courses.

Auditions are required for admission to the program. All students teach and are carefully observed in clinical settings by members of the music education faculty. This is intended to ensure the maximum development and growth of each student's professional and personal competencies. Each student is assigned to an adviser who guides him or her through the various stages of the program in music and music education.

Instrumental

Pre-Professional/Subject Area Course Work

MUSP 109, 110—Applied Music (Principal Instrument) (2,2)
MUSC 150, 151—Theory of Music I, II (3,3)
MUSC 102, 103—Beginning Class Piano I, II (2,2)
MUSC 116, 117—Study of Instruments (2,2)
COMM 100, 125, or 220 (3)
MUED 197—Pre-Professional Experiences (1)
MUSP 207, 208—Applied Music (Principal Instrument) (2,2)
MUSC 250, 251—Advanced Theory of Music I, II (4,4)
MUSC 113, 121—Class Study of Instruments (2,2)
MUSC 230—History of Music I (3)
MUSP 305, 306—Applied Music (Principal Instrument) (2,2)
MUSC 490, 491—Conducting (2)

MUSC 120, 114—Class Study of Instruments (2,2)
 MUED 470—General Concepts for Teaching Music (1)
 MUED 411—Instrumental Music: Elementary (3)
 MUED 420—Instrumental Music: Secondary (2)
 MUED 410—Instrumental Arranging (2)
 MUED 472—Choral Techniques and Repertoire (2)
 MUSC 330, 331—History of Music (3,3)
 MUSP 409—Applied Music (Principal Instrument) (2)
 MUSC 229—Ensemble (7)

Professional Courses

EDHD 413—Adolescent Development (3)
 EDHD 420—Cognitive Development and Learning (3)
 EDPA 301—Foundations of Education (3)
 EDCI 390—Principles and Methods of Secondary Education (3)
 EDCI 484/494—Student Teaching: Music (4) (4)

General Music/Choral

Pre-Professional/Subject Area Course Work

MUSP 109, 110—Applied Music (Principal Instrument) (2,2)
 MUSC 150, 151—Theory of Music I, II (3,3)
 MUSC 100—Class Voice, MUSC 200 Advanced Class Voice (2,2) or MUSC 102, 103—Class Piano (2,2)
 MUSC 110, 111—Class Strings (2, 2)
 MUED 197—Pre-Professional Experiences (1)
 COMM 100, 125, or 220 (3)
 MUSP 207, 208—Applied Music (Principal Instrument) (2,2)
 MUSC 230—Music History (3)
 MUSC 202, 203—Advanced Class Piano (2,2)
 MUSC 250, 251—Advanced Theory of Music (4,4)
 MUSP 305, 306—Applied Music (Principal Instrument) (2,2)
 MUSC 453—Guitar-Recorder Methods (2)
 MUED 472—Choral Techniques and Repertoire (2)
 MUSC 490, 491—Conducting (2,2)
 MUED 478—Special Topics in Music Education (1)
 MUED 470—General Concepts for Teaching Music (1)
 MUED 471—Elementary General Music Methods (3)
 MUSC 330, 331—History of Music (3,3)
 MUSP 409—Applied Music (Principal Instrument) (2)
 MUSC 329—Major Ensemble (7)

Professional Courses

EDHD 413—Adolescent Development (3)
 EDHD 420—Cognitive Development and Learning (3)
 EDCI 390—Principles and Methods of Secondary Education (3)
 EDPA 301—Foundations of Education (3)
 EDCI 484/494—Student Teaching: Music (4) (4)
 *Varies according to incoming placement

Physical Education and Health Education

This curriculum is designed to prepare students for teaching physical education and health in elementary and secondary schools. To obtain full particulars on course requirements, the student should refer to the sections on the Department of Kinesiology and the Department of Health Education.

Science Education

A science major consists of a minimum of 60 semester hours' study in the academic sciences and mathematics.

The following courses are required for all science education majors: BIOL 105 and 106; CHEM 103 and CHEM 104 (except chemistry, physics, and earth science education majors who take CHEM 113); GEOL 100-110; PHYS 121-122 or 141-142; and six semester hours of mathematics. Science education majors must achieve a minimum of grade C in all required mathematics, science, and education course work.

An area of specialization planned with the approval of the student's adviser must be completed in biology, chemistry, earth science and physics as noted below.

Biology Education

Pre-Professional/Subject Area Course Work

MATH 110—Elementary Mathematical Models (3)
 BIOL 105—Principles of Biology I (4)

BIOL 106—Principles of Biology II (4)
 MATH 111—Introduction to Probability (3)
 CHEM 103—General Chemistry I (4)
 CHEM 104—Fundamentals of Organic and Biochemistry (4)
 ZOO 201 or 202—Human Anatomy and Physiology I and II (4)
 PBIO 200—Plant Diversity or ZOO 210 Animal Diversity (4)
 MICB 200—General Microbiology (4)
 PHYS 121—Fundamentals of Physics I (4)
 GEOL 100/110—Physical Geology and Laboratory (4)
 COMM 107, 125 or HESP 202 (3)
 BIOL 222—Principles of Genetics (4)
 PBIO 420—Plant Physiology (4)
 ZOO 480 (4), PBIO 250 (4), and ENTM 205
 PHYS 122—Fundamentals of Physics II (4)
 PBIO 440-441 or ZOO 212 Plant Ecology (4)

Professional Courses

EDHD 413—Adolescent Development (3)
 EDHD 420—Cognitive Development and Learning (3)
 EDPA 301—Foundations of Education (3)
 EDCI 390—Principles and Methods of Secondary Education (3)
 EDCI 370—Curriculum and Instruction in Secondary Education: Science (3) (fall only)
 EDCI 471—Student Teaching in Secondary Schools: Science (12)
 EDCI 371—Computers in the Science Classroom and Laboratory (2)
 EDCI 470—Student Teaching Seminar in Secondary Education: Science (1)

Chemistry Education

Pre-Professional/Subject Area Course Work

BIOL 105—Principles of Biology I (4)
 BIOL 106—Principles of Biology II (4)
 CHEM 103—General Chemistry I or 105 (4)
 CHEM 113—General Chemistry II or 104 (4)
 MATH 140, 141—Calculus I and II (4, 4)
 COMM 107, 125 or HESP 202 (3)
 CHEM 233, 243—Organic Chemistry I and II (4, 4)
 PHYS 141, 142—Principles in Physics (4, 4)
 GEOL 100, 110—Physical Geology and Lab (4)
 CHEM 321—Quantitative Analysis (4)
 CHEM 481, 482—Physical Chemistry I and II (3,3)
 CHEM 483—Physical Chemistry Laboratory I (2)
 CHEM Elective (3)

Professional Courses

EDHD 413—Adolescent Development (3)
 EDHD 420—Cognitive Development and Learning (3)
 EDPA 301—Foundations of Education (3)
 EDCI 390—Principles and Methods of Secondary Education (3)
 EDCI 370—Curriculum and Instruction in Secondary Education: Science (3) (fall only)
 EDCI 471—Student Teaching in Secondary Schools: Science (12)
 EDCI 371—Computers in the Science Classroom and Laboratory (2)
 EDCI 470—Student Teaching Seminar in Secondary Education: Science (1)

Earth Science Education

Pre-Professional/Subject Area Course Work

GEOL 100, 110—Physical Geology, Lab (4)
 GEOL 102—Historical Geology and Lab (4)
 BIOL 105—Principles of Biology I (4)
 BIOL 106—Principles of Biology II (4)
 MATH 110 or 140—Elementary Mathematical Models (3) or
 Calculus I (3)
 MATH 111 or 141—Introduction to Probability (3) or
 Calculus II (3)
 COMM 107 or 125 or HESP 202 (3)
 GEOL 322—Mineralogy (4)
 GEOL 340—Geomorphology (4)
 GEOL 341—Structural Geology (4)
 CHEM 103, 113—General Chemistry I and II (4,4)
 ASTR 101—General Astronomy (4)
 PHYS 121, 122—Fundamentals of Physics I and II (4, 4)

Professional Courses

EDHD 413—Adolescent Development (3)
 EDHD 420—Cognitive Development and Learning (3)
 EDCI 390—Principles and Methods of Secondary Education (3)

104 Curriculum and Instruction

EDCI 370—Curriculum and Instruction in Secondary Education: Science (3) (fall only)
EDPA 301—Foundations of Education (3)
EDCI 471—Student Teaching in Secondary Schools: Science (12)
EDCI 371—Computers in the Science Classroom and Laboratory (2)
EDCI 470—Student Teaching Seminar in Secondary Education: Science (1)

Physics Education

Pre-Professional/Subject Area Course Work

CHEM 103, 113—General Chemistry I and II (4,4)
MATH 140, 141—Calculus I and II (4,4)
PHYS 141, 142—Principles of General Physics I and II (4,4) or Engineering or Physics Majors Sequence
COMM 107, 110, or HESP 202 (3)
BIOL 105—Principles of Biology I (4)
BIOL 106—Principles of Biology II (4)
PHYS 275—Experimental Physics I (1)
PHYS 276—Experimental Physics II (2)
PHYS 375—Experimental Physics III (2)
ASTR 101—General Astronomy (4)
MATH 240—Linear Algebra (4)
PHYS 410—Intermediate Theoretical Physics (3)
PHYS 420—Principles of Modern Physics (3)
PHYS 305—Physics Shop Techniques (1)
GEOL 100—Physical Geology (3)
GEOL 110—Physical Geology Laboratory (1)
PHYS 406—Optics (3)
PHYS 499—Special Problems in Physics (2)

Professional Courses

EDHD 413—Adolescent Development (3)
EDHD 420—Cognitive Development and Learning (3)
EDPA 301—Foundations of Education (3)
EDCI 390—Principles and Methods of Secondary Education (3)
EDCI 370—Curriculum and Instruction in Secondary Education: Science (3) (fall only)
EDCI 471—Student Teaching in Secondary Schools: Science (12)
EDCI 470—Student Teaching Seminar in Secondary Education: Science (1)
EDCI 371—Computers in the Science Classroom and Laboratory (2)

Social Studies Education

Option I: HISTORY: Requires 54 semester hours of which at least 27 must be in history, usually at least six hours in American history; three hours of non-American history; three hours of non-Western history; three hours in Pro-Seminar in Historical Writing; and 12 hours of electives, nine of which must be 300-400 level. One course in Ethnic and Minority Studies must be included.

Pre-Professional/Subject Area Course Work

COMM 107, 125 or 220 (3)
HIST 156, 157 (U.S.) (6)
HIST (non-U.S. with one course non-Western) (6)
SOCY 100 or ANTH 220 (3)
GEOG 100—Introduction to Geography (3)
GEOG 201 or 211 (3)
ECON 200—Fundamentals of Economics (4)
ECON 310—Evolution of Modern Capitalism (3)
GVPT 100, 240, 260, or 280 (3)
GVPT 170—American Government (3)
Social Science Electives, upper level (6)
History Electives (12)

Professional Courses

EDHD 413—Adolescent Development (3)
EDHD 420—Cognitive Development and Learning (3)
EDCI 390—Principles and Methods of Secondary Education (3)
EDCI 320—Curriculum and Instruction in Secondary Education-Social Studies (3)*
EDCI 428—Field Experience in Social Studies (1); co-requirement EDCI 320
EDCI 421—Student Teaching in Secondary Education: Social Studies (12)
EDCI 420—Student Teaching Seminar in Secondary Education: Social Studies (3)
EDCI 463—Teaching Reading in Secondary Schools (3)
EDPA 301—Foundations of Education (3)

Option II: GEOGRAPHY: Requires 56 semester hours of which 29 hours must be in geography. GEOG 201, 211, 212 are required. Nine hours of 300-level Gateway courses must be taken in physical geography, human geography, and geographic techniques. The remaining 12 hours in

geography must be in upper-level systematic geography courses. One course in Ethnic and Minority studies must be included.

Pre-Professional/Subject Area Course Work

COMM 107, 125, or 220 (3)
GEOG 201—Geography of Environmental Systems (3)
GEOG 211—Geography of Environmental Systems Laboratory (1)
GEOG 212—Human Geography Laboratory (1)
GEOG Gateway—Physical Geography (3)
GEOG Gateway—Human Geography (3)
GEOG Gateway—Geographic Technique (3)
GEOG Systematic Electives (12)
HIST 156 or 157 (3)
HIST (non-Western) 101, 130-133, 144-145 (3)
SOCY 100 or ANTH 220 (3)
ECON 200 (4)
ECON 310, 311, or 315 (3)
GVPT 100, 240, or 280 (3)
GVPT 170—American Government (3)
History/Social Science Electives (3)

Professional Courses

EDHD 413—Adolescent Development (3)
EDHD 420—Cognitive Development and Learning (3)
EDCI 390—Principles and Methods of Secondary Education (3)
EDCI 320—Curriculum and Instruction in Secondary Education-Social Studies (3)*
EDCI 421—Student Teaching in Secondary Education: Social Studies (12)
EDCI 420—Student Teaching Seminar in Secondary Education: Social Studies (3)
EDCI 428—Field Experience in Social Studies (1); co-requirement EDCI 320
EDCI 463—Teaching Reading in Secondary Schools (3)
EDPA 301—Foundations of Education (3)

Speech/English Education

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

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

Pre-Professional/Subject Area Course Work

Speech Area (6): COMM 107—Speech Communication, COMM 125—Interpersonal Communication, COMM 220—Group Discussion, COMM 230—Argumentation and Debate, COMM 340—Oral Interpretation COMM 470—Listening (3)
COMM 200—Advanced Public Speaking (3)
Film elective
HESP 202—Introduction to Hearing and Speech Sciences or HESP 305 or HESP 400 (3)
THET 110—Introduction to Theatre (3)
COMM 401—Foundations of Rhetoric (3)
COMM 402—Communication Theory and Process (3)
COMM Upper-level electives (6)
ENGL 101—Introduction to Writing (3)
LING 200—Introduction to Linguistics (3)
ENGL 201—or 202 World Literature (3)
ENGL 281—Standard English Grammar, Usage, and Diction or ENGL 383 or ENGL 384 or ENGL 385 or ENGL 482 or ENGL 484 (3)
ENGL 301—Critical Methods in the Study of Literature or ENGL 453 (3)
ENGL 310, 311 or 312—English Literature (3)
ENGL 313—American Literature (3)
ENGL 391 or 393—Advanced Composition or Technical Writing (3)

Professional Courses

EDHD 413—Adolescent Development (3)
EDHD 420—Cognitive Development and Learning (3)
EDCI 390—Principles and Methods of Secondary Education (3)
EDPA 301—Foundations of Education (3)
EDCI 340—Curriculum & Instruction in Secondary Education: Eng/Spch/Drama (3)
EDCI 440—Student Teaching Seminar (1)
EDCI 442—Student Teaching in Speech/English (12)
EDCI 447—Field Experiences (1)
EDCI 463—Teaching of Reading (3)
EDCI 466—Literature for Adolescents (3)
EDCI 467—Teaching Writing (3)

Theatre/English Education

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

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

Pre-Professional/Subject Area Course Work

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

Professional Courses

EDHD 413—Adolescent Development (3)
 EDHD 420—Cognitive Development and Learning (3)
 EDCI 390—Principles & Methods of Secondary Education (3)
 EDPA 301—Foundations of Education (3)
 EDCI 340—Curriculum & Instruction in Secondary Education: Eng/Spch/Drama (3)
 EDCI 463—Teaching of Reading (3)
 EDCI 467—Teaching Writing (3)
 EDCI 466—Literature for Adolescents (3)
 EDCI 447—Field Experience (1)
 EDCI 448—Student Teaching in Theatre/English (12)
 EDCI 440—Student Teaching Seminar (1)

Course Code: EDCI

DANCE (DANC)

College of Arts and Humanities

Dance Building, (301) 405-3180

Professor and Chair: Wiltz
 Professors: Rosen, A. Warren
 Instructors: Mayes, Wright
 Emeriti: Madden, L. Warren
 Lecturers: Druker, Jackson, Perez
 Accompanists: Freivogel, Johnson

The Major

Recognizing that dance combines both athleticism and artistry, the dance program offers comprehensive technique and theory courses as a foundation for the dance professions. By developing an increasing awareness of the physical, emotional, and intellectual aspects of movement in general, the student eventually is able to integrate his or her own particular mind-body consciousness into a more meaningful whole. To facilitate the acquisition of new movement skills, as well as creative and scholarly insights in dance, the curriculum provides a structured breadth of experience at the lower level. At the upper level students may either involve themselves in various general university electives, or they may concentrate their energies in a particular area of emphasis in dance. Although an area of emphasis is not mandatory, many third—and fourth-year students are interested in studying a singular aspect of dance in depth, such as performance, choreography, production/management, or general studies (encompassing dance history, literature and criticism).

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 several performance and choreographic opportunities for all dance students, ranging from informal workshops to fully mounted concerts both on and off campus.

Requirements for Major

Requirements for the Dance major include a minimum of 45 upper-level credits completed and the foreign language requirement of the College of Arts and Humanities. Students must complete 57 semester hours of dance credits. Of these, 18 hours of modern technique and four hours of ballet technique are required. Majors may not use more than 72 DANC credits toward the total of 120 needed for graduation. In addition to the 22 technique credits required, students must distribute the remaining 35 credits as follows:

DANC 208, 308, 388—Choreography I, II, III	9
DANC 102—Rhythmic Training	2
DANC 109—Improvisation	2
DANC 365—Dance Notation	3
DANC 200—Introduction to Dance	3
DANC 305—Principles of Teaching	3
DANC 483—Dance History II	3
DANC 370—Kinesiology for Dancers	4
DANC 210—Dance Production	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.

Dance Concentration

The Department of Dance offers a Concentration in Dance of 22-24 credits. Students take 14-15 hours of specified core courses and 8-9 hours of courses in an emphasis of the student's choice.

Course Code: DANC

DECISION AND INFORMATION SCIENCES

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

ECONOMICS (ECON)

College of Behavioral and Social Sciences

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

Professor and Chair: Straszhheim
 Professors: Almon, Ausubel, Betancourt, Calvo††, Crampton, Cropper, Dorsey, Drazen, Evans, Haltiwanger, Hulten, Kelejian, Montgomery, Murrell, Oates, Panagariya, Prucha, Schelling* (Public Affairs), Schwab, Wallis
 Associate Professors: Coughlin, Lyon, Sakellaris, Shea, Vincent
 Assistant Professors: Binder, Chao, Gelbach, Hellerstein, Kranton, Rodriguez, Sen, Swamy
 Emeriti: Bennett, Bergmann, Brechling, Clague, Cumberland, Dardis, Harris, McGuire, Meyer, O'Connell, Polakoff, Ulmer, Wonnacott

*Joint appointment with unit indicated

††Distinguished University Professor

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 33 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 12 hours of core requirements. The core requirements include ECON 200, ECON 201, ECON 305 and ECON 306.

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

- three hours in statistics; ECON 321 or STAT 400 (check with adviser). Majors who declared after January 1, 1998, must take ECON 321 or STAT 400.
- three hours in economic history or comparative systems; ECON 310, ECON 311, ECON 315, ECON 380, or ECON 410;
- nine hours in courses with at least one semester of intermediate theory (ECON 301 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 36 hours of Economics (and Mathematics) courses listed above and the university's CORE requirements. Upper division courses include all courses with a 300 number and above except the Junior English writing class. Additional mathematics courses beyond the required mathematics course (MATH 220 or 140), and computer programming courses at the 200-level and above may be counted as fulfilling the Additional Support Course Requirement. Additional economics courses may be included among the 15 hours of supporting courses.

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

Study Sequences and Plans of Study

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

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

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

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

Those students planning to pursue graduate study in economics must begin to prepare themselves analytically for graduate work by focusing on theory, statistics, and mathematics in their undergraduate curriculum. These students should consider the advanced theory courses (ECON 407 and ECON 417) and the econometrics sequence (ECON 422 and ECON 423). Mastery of the calculus and linear algebra is essential for success in many of the top graduate schools. Students should consider MATH 140, MATH 141, MATH 240 (or MATH 400), MATH 241 and MATH 246 as very useful preparation.

Advising

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

Honors

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

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

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

Awards

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

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

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

Student Organizations

Omicron Delta Epsilon, the economics honorary society, meets regularly to discuss graduate study in economics and other fields, employment opportunities, and recent economic trends. Please see the Undergraduate Economics Secretary, 3105 Tydings Hall, for membership information.

Course Code: ECON

EDUCATION POLICY, PLANNING AND ADMINISTRATION (EDPA)

College of Education

2110 Benjamin Building, (301) 405-3574

Professor and Chair: Cibulka

Professors: Birnbaum, Finkelstein, Hawley, Hultgren, Malen, Selden

Associate Professors: Goldman, Herschbach, Mawhinney, Schmidlein, Splaine

Assistant Professors: Croninger, Fries-Britt, Mintrop, Rice

Emeriti: Berdah†, Berman, Carbone, Clague, Dudley, Newell, Male, Stephens, McLoone

Visiting Professor: Andrews

†Distinguished Scholar-Teacher

Master's and Doctoral Programs in EDPA

M.A. in Education Leadership and Policy Studies: specializations in elementary/secondary education leadership; higher education; education policy studies; and curriculum policy. **M.A. in Social Foundations of Education; M.A. or M.Ed. in Curriculum Theory and Development; Ph.D in Education Policy:** specializations in curriculum theory and development; education leadership; education policy analysis; higher education; international education studies; and social foundations of education. **Ed.D. in Education Leadership and Policy Studies:** specializations in elementary/secondary education leadership; curriculum theory and development; and higher education.

Course Code: EDPA

ELECTRICAL ENGINEERING (ENEE)

A. James Clark School of Engineering

2429 A.V. Williams Building, (301) 405-3683

E-mail: eeadvise@deans.umd.edu

<http://www.ee.umd.edu>

Professor and Chair: Farvardin

Associate Chairs: Blankenship (External Relations), Papamarcou (Undergraduate Program), Striffler (Facilities and Services); Tits (Graduate Program)

Professors: Abed, Antonsen, Baras (Martin-Marietta Chair in Systems Engineering), Barbe, Blankenship, Chellappa, Dagenais, Davis†, DeClaris, Destlert, Emad, Ephremides, Frey, Geraniotis, Gligor, Goldhar, Granatstein, Harger, Ho, Ja'Ja', Krisnaprasad, Langenberg, Lawson, Lee, Levine, Makowski, Marcus, Mayergoyz†, Melngailis, Nakajima, Narayan, Newcomb, Orloff, Oruc, O'Shea, Ott††, Peckerar (part-time), Rabin, Rhee, Shamma, Shayman, Striffler, Tits, Venkatesan, Vishkin, Zaki

Associate Professors: Goldsman, Iliadis, Liu, Papamarcou, Silio, Tassiulas, Tretter, Yang

Assistant Professors: Bhattachayya, Franklin, Gansmen, Gomez, Jacob, Marculescu, Papadopoulos, Stewart, Yeung

Emeriti: Davisson, Hochuli, Ligomenides, Lin, Pugsley, Reiser, Taylor, Wagner, Young

†Distinguished Scholar-Teacher

†† Distinguished University Professor

The Major

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

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

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

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

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

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. A sample program is shown below.

	Semester	
	I	II
First Year		
CHEM 133—General Chemistry.....	4	
PHYS 161—General Physics.....	3	
MATH 140, 141—Analysis I,II.....	4	4
ENES 100—Intro./Engr. Design.....	3	
ENEE 114—Programming Concepts for Engineers.....	4	
CORE—General Education Courses.....	3	3
Total.....	14	14
Sophomore Year		
MATH 241—Calculus III.....	4	
MATH 246—Differential Equations.....	3	
PHYS 262, 263—General Physics.....	4	4
ENEE 241—Numerical Techniques in Engineering.....	3	
ENEE 244—Digital Logic Design.....	3	
ENEE 204—Basic Circuit Theory.....	3	
ENEE 206—Digital and Circuits Lab.....	2	
CORE—General education courses.....	3	3
Total.....	17	15
Junior Year		

108 Engineering, Bachelor of Science Degree in

MATH 4xx*—Advanced Elective Math	3
ENEE 302—Analog Electronic Circuits	3
ENEE 306—Electronic Circuits Design Lab	2
ENEE 312—Devices and Analog Circuits	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 Propagation	3
CORE—General education courses	3
Total	15

Senior Year

CORE—General education courses	6	3
ENEE 4xx**—Advanced Elective Lab	2	2
Technical Electives* (Non-EE technical electives)	3	6
Technical Electives** (EE electives)	6	3
Total	17	14

*From approved Non-EE Technical Elective List

** Must include a Capstone Design Course, as well as 7 design credits.

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

Financial Assistance

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

Honors and Awards

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

Department Honors Program

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

Student Organizations

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

Information on eligibility can be obtained from the EE Undergraduate lounge, from the departmental Undergraduate Office, or from the College Student Affairs Office. Harmonics Coalition is a student-run group, assisting new students as they become acclimated to the University.

Course Code: ENEE

ENGINEERING, BACHELOR OF SCIENCE, DEGREE IN

A. James Clark School of Engineering

1131 Engineering Classroom Building, (301) 405-3855

General Regulations for the B.S. Engineering Degree

This program is under revision. Students should consult a department adviser for information.

All undergraduates in engineering will select their major field sponsoring department at the beginning of their second year regardless of whether they plan to proceed to a designated or an undesignated degree. A student wishing to elect the undesignated 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 an undesignated baccalaureate in engineering, the student's curriculum planning, guidance, and counseling will be the responsibility of the "Undesignated Degree Program Adviser" in the primary field department. The student must file an "Application for Admission to Candidacy for the Degree of Bachelor of Science in Engineering" with the student affairs office of the A. James Clark School of Engineering. The candidacy form must be approved by the chair of the primary field department, the primary engineering, and the secondary field advisers and the college faculty committee on "Undesignated 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 undesignated 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 2.0 GPA in the major field during the junior and senior years applies. For the purpose of implementation of such academic rules, the credits in the primary engineering field and the credits in the secondary field are considered to count as the "major" for such academic purposes.

Options of the "B.S. Engineering" Program

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

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

The applied science option, which is not ABET-accredited, should be particularly attractive to those students who do not plan to pursue a professional engineering career but wish to use the rational and developmental abilities fostered by an engineering education as a means of furthering career objectives. Graduates of the applied science option may aspire to graduate work and an ultimate career in a field of science,

law, medicine, business, or a variety of other attractive opportunities which build on a combination of engineering and a field of science. Entrance requirements for law and medical schools can be met readily under the format of this program. In the applied science program, any field in the university in which the student may earn a B.S. degree is an acceptable secondary science field, thus affording the student a maximum flexibility of choice for personal career planning.

Minimum Requirements

Listed below are the minimum requirements for the B.S. Engineering degree with either an engineering option or an applied science option. Students completing the B.S. in 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 Sciences ^{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, mechanical engineering, and nuclear engineering. There is also an environmental engineering option. All engineering fields of concentration may be used as a secondary field within the engineering option.

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

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

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.

⁷For the engineering option, the program must contain the proper design component, as specified by ABET requirements. It is the responsibility of students and their advisers to ensure that the requirements are satisfied

by the appropriate selection of courses in the primary and secondary fields of concentration.

ENGLISH LANGUAGE AND LITERATURE (ENGL)

College of Arts and Humanities

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

Undergraduate Advisers: 2115 Susquehanna Hall, (301) 405-3825

Freshman English Office: 2101 Susquehanna Hall, (301) 405-3771

Professional Writing Program: 3119 Susquehanna Hall, (301) 405-3762

Chair: Caramello

Professors: Auchard, Auerbach, Beauchamp (Emerita), Berlin, Bryer, Caramello, Carretta, Coletti, Collier, Collins, Coogan, Cross, Donawerth, Fahnestock, Flieger, Fraistat, Freedman (Emeritus), Fry, Grossman, D. Hamilton, Handelman†, Holton, Howard, Isaacs, Jellema (Emeritus), Kauffman, Kolker, Kornblatt, Lanser†, Lawson (Emeritus), Leonardi, Levine, Lutwack (Emeritus), Mack, McKnight, Miller (Emerita), Myers (Emeritus), Norbrook, Panichas (Emeritus), Pearson, C. Peterson, W. Peterson, Plumly, Salamanca (Emeritus), Smith, Trousdale (Emerita), Turner, Vitzhum (Emeritus), Washington, Whittemore (Emeritus), Winton (Emeritus), Wyatt

Associate Professors: Achinstein, Barry, Cartwright, Cate, Coleman, G. Hamilton, Hammond, Kleine, Leinwand, Levin, Lindemann, Logan, Loizeaux,

Marcuse, McDowell, Moser, Norman, Ray, Richardson, Schlib, Van Egmond,

Wang

Assistant Professors: Bauer, Chuh, Cohen, King, Rutherford, Sherman

Instructors/Lecturers: Terchek, Miller, Ryan

†Distinguished Scholar-Teacher

Advising

Departmental advising is mandatory for all majors each semester.

The Major

The English major was designed with three purposes in mind: 1) to give students a sense of the variety of literature written in English over the centuries; 2) to help English majors develop their abilities to think carefully and to express themselves well; and 3) to introduce students to the debates about literature that shape our intellectual lives. An English major is good professional preparation for a career in the law, government, journalism, business, communication, teaching, or any field that requires strong analytical and communication skills.

Requirements for Major

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

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

CORE Requirements (18 credits)

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

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

Specializations (12 credits)

(Four courses beyond the CORE Requirements)

110 Entomology

Students choose one of the following:

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

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

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

English and English Education Double Major

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

Honors

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

The Writing Center

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

Course Code: ENGL

ENTOMOLOGY (ENTM)

College of Life Sciences

4112 Plant Sciences Bldg., (301) 405-3911

Professor and Chair: Raupp

Professors: Barbosa, Bickley (Emeritus), Bottrell, Davidson (Emeritus), Denno, Harrison (Emeritus), Hellman, Jones (Emeritus), Ma, Menzer (Emeritus), Messersmith (Emeritus), Raupp, Steinhauer (Emeritus), Via, Wood (Emeritus)

Associate Professors: Armstrong, Brown, Dively, Lamp, Linduska, Mitter, Nelson, Regier, St. Leger

Assistant Professors: Hawthorne, Richman, Shultz, Thorne
Instructor: Kent

Assistant Research Scientist: Sina

Director of Undergraduate Studies: Kent

The Major

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

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

Requirements for Specialization

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

Course Code: ENTM

ENVIRONMENTAL SCIENCE AND POLICY PROGRAM (ENSP)

0207 Symons Hall, (301) 405-8571

E-mail: bj5@umail.umd.edu

Director: James

Environmental Science and Policy is a new broadly interdisciplinary major, drawing courses and faculty from 20 departments and 4 Colleges (Agriculture and Natural Resources; Behavioral and Social Sciences; Computer, Mathematical, and Physical Sciences; and Life Sciences). There are 13 areas of concentration within the major, most of which are also cross-disciplinary. Students will choose a particular area of concentration and will be assigned an adviser from among the faculty who are responsible for the particular area. Students will have the opportunity to change area of concentration from that originally selected as they learn about the diversity of the major and its offerings. The degree (B.A. or B.S.) earned will be in Environmental Science and Policy and in the area of concentration chosen. For some administrative purposes, the students will be associated with the Colleges of their academic advisers.

The Major

Environmental Science and Policy students will take a core of 10 courses, including 9 lower-division courses chosen from restricted lists and a Capstone course required of all majors during their senior year, and upper-division courses defined by the area of concentration. After accounting for prerequisites, CORE courses, and upper-division requirements, any area of concentration may be completed while allowing approximately 24 hours of free electives in a normal 120-hour program leading to the B.S. or B.A. degree. Some areas of concentration require an internship, and students will be encouraged to pursue practical work and volunteer opportunities as part of their undergraduate programs.

Requirements for Major

ENSP CORE

1. A one-year introductory course sequence (ENSP 101-102) for three credits each semester, emphasizing Environmental Science in the first semester and Environmental Policy in the second.
2. At least one course each from five of the following six groups: a) Biology (BIOL 106); b) Chemistry (CHEM 103); c) Earth Sciences (GEOL 103, GEOL 107, GEOL 100-110, GEOG 201-211, AGRO 202, METO 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, BIOM 401, ECON 321, PSYC 200, SOCY 201, STAT 400)
5. The Capstone course (a 400-level ENSP course in the senior year)

Areas of Concentration

Agroecology; Biodiversity and Conservation Biology; Earth Surface Processes; Environmental Economics; Environmental Management; Environmental Mapping and Data Management; Environmental Plant Protection; Environmental Politics and Policy; Land Use; Landscape Ecology; Society and Environmental Issues; Soil, Water, and Land Resources; Wildlife Resources and Conservation

Advising

Advising is mandatory. Before registering, students should contact the

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

<http://www.wam.umd.edu/~fmst>

Professor and Chair: Koblinsky
 Professors: Epstein, Gaylin, Hampton
 Associate Professors: Anderson, Leslie, Mokhtari, Myricks, Randolph, Rubin, Wallen
 Instructors: Millstein, Werlinich
 Lecturer: Davis

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) the development and functioning of individuals within the family, and 3) the relationship of the family to its larger socio-cultural, historical, political and economic context. Students develop a working knowledge of individual and family development throughout the life span, interpersonal relations, and resource use. Courses examine family dynamics, changing family structures, ethnic families, intergenerational relations, family crises, family violence, family policy, legal problems, and family economics. Students study prevention and intervention strategies for combatting family problems. The reciprocal relationships between families and the social policies, practices and management of institutions and organizations are examined. The curriculum prepares students for careers in human services, human resource management, family life education, public policy and related positions emphasizing the family. Opportunities exist in public, private and non-profit agencies and institutions working with family members, entire family units or family issues. Graduates are also prepared for graduate study in the family sciences, family therapy, human services administration, health, law, social work, human resource management and other social and behavioral science disciplines and professions.

Curriculum

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

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

(b) **Six additional departmental credits must be selected from any other FMST courses, with the exception of independent study (FMST 399, FMST 498) and field work (FMST 386, FMST 387). Must receive a grade of C or better.**

(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 Engineering Classroom Building, (301) 405-3992

<http://www.enfp.umd.edu>

Professor and Chair: Spivak
 Professors: Brannigan, Quintiere
 Associate Professors: Milke, Mowrer
 Assistant Professor: Torero
 Lecturers (part-time): Gagnon, Parker
 Emeritus: Bryan
 Affiliate Professor: diMarzo

The Major

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

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

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

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

Requirements for Major

	Semester	
	I	II
Freshman Year		
CORE Program Requirements (incl. Engl 101)	3	6
CHEM 103 and 113 or 133—General Chemistry	4	(4)
MATH 140, 141—Analysis I, II	4	4
ENES 100—Introduction to Engineering Design	3	
ENES 102—Statics		2
PHYS 161—General Physics I	3	
Total	14	15
Sophomore Year		
CORE Program Requirements	3	3
MATH 240—Linear Algebra or		
MATH 241—Analysis III		4

112 French and Italian Languages and Literature

MATH 246—Differential Equations.....	3
PHYS 262, 263—General Physics	4
ENES 221,220—Dynamics/Mechanics of Materials	3
ENFP 251—Introduction to Fire Protection Engineering.....	3
ENFP 255—Fire Alarm and Special Hazards Design	3
Total	17.....16

Junior Year

CORE Program Requirements	3.....6
ENME 320—Thermodynamics	3
ENXX or CMSC—Approved Computational Analysis or Computer Applications	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
Elective—Approved Elective (CHEM, ENFP, ENES, ENXX)*	3
Total	16.....15

Senior Year

CORE Program Requirements	3
ENFP 405—Structural Fire Protection.....	3
ENFP 411—Fire Risk Assessment	3
ENFP 415—Fire Dynamics	3
ENFP 416—Problem Synthesis and Design	3
ENFP 421—Life Safety and Risk Analysis.....	3
Elective—Approved Electives (CHEM, ENFP, ENES, ENXX)*	6.....3
ENFP 450—Professional Development Seminar.....	1
Total	15.....13

*At least 3 credits of Approved Electives must be in ENFP and statistics is a recommended course, e.g. STAT 400, BIOM 401, or MATH 400 and a further chemistry course is recommended. A list of approved electives is available.

Admission

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

Advising

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

Fieldwork and Internship Opportunities

Part-time and summer professional experience opportunities and paid internship information is available in the department Office, 0151 Glenn L. Martin Hall. Coordinator: S. M. Spivak, (301) 405-6651.

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 <http://www.enfp.umd.edu>.

Honors and Awards

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

Student Organizations

The departmental honor society, Salamander, is open to academically eligible junior and senior students. The University of Maryland student chapter of the Society of Fire Protection Engineers is the professional society for all interested students in the department. Student membership

in the National Fire Protection Association is available too. Information on these organizations may be obtained from current members in the student lounge, 1123 Engineering Laboratory Building, (301) 405-3999.

Course code: ENFP

FOOD SCIENCE PROGRAM

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

FRENCH AND ITALIAN LANGUAGES AND LITERATURES (FRIT)

College of Arts and Humanities

3106C Jimenez Hall, (301) 405-4024

Professor and Chair: Russell

Professors: Hage, Mossman, Verdaguer

Associate Professors: Black, Brami, Campagne, Falvo

Assistant Professors: Frindéthié, Letzter, Scullen

Lecturers: Amodeo, C. P. Russell

Affiliate Lecturer: Jacoby

Emeriti: Fink, MacBain, Meijer, Tarica, Therrien

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

The French Major

Changes in requirements are under review. Students should consult the department for updated information. 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 Director of Undergraduate Advising as early as possible for proper planning.

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.

Advising

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

Core required of all majors (9 credits): FREN 204, 250, 301.

Additional requirements outside French for both options: 12 credits in supporting courses as approved by department, or at least 12 credits (six credits at 200- level and six credits at 300-400 level) in one specific area, representing a coordinated plan of study.

French Language, Culture and Literature Option (27 credits)

In addition to core: FREN 351, 352; 311 or 312 or 404; 401 or 405; 302 or 402; four additional 400-level courses.

French and International Business Option (27 credits)

In addition to core: FREN 302, 303, 306, 311, 312; 401 or 402; 406, 473, 474.

Honors

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

The Italian Major

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

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

Romance Languages

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

Course Codes: FREN, ITAL

GEOGRAPHY (GEOG)

College of Behavioral and Social Sciences

2181 Lefrak Hall, (301) 405-4050

<http://www.inform.umd.edu/GEOG>

Associate Chair: Cirrincione

Chair: Goward

Professors: Goward, Prince, Townshend

Associate Professors: Brodsky, Christian, Cirrincione* (Curriculum and Instruction), Dubayah, Kearney, Thompson

Assistant Professors: Geores, Liang

Lecturers (part-time): Eney, Kinerney

Professor Emeritus: Harper, Wiedel

114 Geology

Junior Year

ENGL 391 or GEOG 310.....	3
CORE Advanced Studies.....	3
Advanced Human Geography.....	3
Advanced Physical Geography.....	3
Advanced Technique Geography.....	3
Geography Upper-Level Elective.....	3
Electives.....	12

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 Service/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 Cartography must take the Geography Primary courses, totalling eight hours: one upper-level course in physical geography, and one in human geography plus six hours of systematic electives, totalling 12 hours; and Cartography/Geographic technique courses, totalling 15 hours. Supporting area courses must be taken from a list provided by the department. All math programs should be approved by a departmental adviser.

Geography Minor and Secondary Education Geography Specialization

Secondary Education majors with a concentration in geography are required to take 29 hours in geography. Eight hours of Primary Courses (GEOG 201/211, 202/212) are required, plus at least one upper-level gateway course in physical geography, human geography, and geographic techniques. The remaining 12 hours are to be selected from upper-level systematic geography electives. For majors in elementary education and others needing a geography course for teaching certification, GEOG 100 is the required course.

Geography minors should take at least GEOG 201/211, 202/12, and at least one upper-level gateway course in physical geography, human geography, and geographic techniques.

Internship Opportunities

The department offers a one-semester internship program for undergraduates (GEOG 384 and 385). The goal of the program is to enhance undergraduates' intellectual growth and career opportunities. The internship provides an opportunity for the students to expand their understanding of the field by linking the theoretical aspects of geography acquired in the classroom to the applied aspects operating in a practice situation. The internship program is open only to geography juniors and seniors. All interns must have completed the following prerequisites: GEOG 201/211, 202/212, 305 or its equivalent, and the upper-level writing

requirement. An application form from the undergraduate geography adviser must be submitted one semester before the internship is desired. See Professor Cirrincione, 1125 LeFrak Hall, (301) 405-4053.

Honors

For information on the geography honors program, contact the undergraduate adviser.

Student Organizations

Gamma Theta Upsilon, the geography undergraduate organization, operates a program of student-sponsored talks and field trips. Information may be obtained from Professor Dubayah, 1161 LeFrak Hall, (301) 405-4069.

Course Code: GEOG

GEOLOGY (GEOL)

College of Computer, Mathematical and Physical Sciences

1115 Geology Building, (301) 405-4365
<http://www.geol.umd.edu>

Professor and Chair: Brown
Professors: Candela, Chang, Walker, Wylie
Associate Professors: McLellan, Prestegaard, Ridky, Stifel (emeritus)
Assistant Professors: Gallup, Kaufman
Adjunct Professor: Zen
Adjunct Associate Professor: Luhr
Adjunct Assistant Professors: Böhkle, Shirey
Senior Research Scientist: Morgan
Assistant Research Scientists: Brandon, Piccoli
Lecturers: Holtz
†Distinguished Scholar-Teacher

The Major

Geology is the science of the Earth. In its broadest sense, geology concerns itself with planetary formation and subsequent modification, with emphasis on the study of planet Earth. Geologists study Earth's internal and surficial structure and materials, the chemical and physical processes acting within and on the Earth, and utilize the principles of mathematics, physics, chemistry, and biology to understand our planet and its environments.

Geological Studies encompass all the physical, chemical, and biological aspects of Earth. Increasingly, geologists are taking a holistic approach in the collection and interpretation of data about the Earth, which means that the wider context of the geological sciences is broad and diverse. In studying the Earth as a system, we are concerned with geology and geophysics, hydrology, oceanography and marine science, meteorology and atmospheric science, planetary science, and soil science. A major in any relevant discipline can lead to a satisfying career within the geological sciences. In general, graduate training is expected for advancement to the most rewarding positions and for academic employment.

Geologists are employed by governmental, industrial, and academic organizations. Geologists work in exploration for new mineral and hydrocarbon resources, as consultants on engineering and environmental projects, as teachers and researchers in universities, and in many other challenging positions. For many, the attraction of a career in geology is the ability to divide time between work in the field, the laboratory, and the office. Although the employment outlook within geology varies with the global economic climate, the long-range outlook is good. This is because our dwindling energy, mineral, and water resources, along with increasing concerns about natural hazards and environmental issues, present new challenges for geologists.

The Geology Program at Maryland includes a broad range of undergraduate courses to accommodate both Geology majors and students within the Environmental Science and Policy Program. Within the Geology major, a requirement exists for a senior undergraduate research project to be performed under the direction of a faculty adviser. This requirement provides invaluable experience in writing proposals and reports, gathering, analyzing and evaluating data, and delivering scientific talks. In addition, a Departmental Honors Program and a combined B.S./M.S. Program are available.

Requirements for Major

The geology curriculum is designed to meet the requirements of industry, graduate school, and government. For the B.S. degree, the students are required to complete the departmental requirements (49 credits) and the supporting requirements (23/24 credits) in addition to the CORE (general education) Program requirements. The department also requires that to receive a degree in geology, students must have a grade of C or better in the required geology courses, and an average of C or better in the supporting courses.

Courses required for the B.S. in Geology are listed below. Some courses require field trips for which students are expected to pay for room (if required), board, and part of the transportation costs. 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 Laboratory	
GEOL 103—Water, Earth and Humans	
GEOL 105—Geology of Maryland	
GEOL 107—Natural Hazards	
GEOL 102—Historical Geology	4
GEOL 322—Mineralogy	4
GEOL 340—Geomorphology	4
GEOL 341—Structural Geology	4
GEOL 342—Sedimentation and Stratigraphy.....	4
GEOL 393—Technical Writing	3
GEOL 394—Research Problems	3
GEOL 445—Geochemistry.....	3
GEOL 451—Groundwater	3
GEOL 423—Optical Mineralogy	3
GEOL 443—Petrology	4
GEOL 490—Field Camp	6
	49

Supporting Requirements

CHEM 103—General Chemistry I	4
CHEM 113—General Chemistry II	4
MATH 140—Calculus I	4
MATH 141—Calculus II	4
PHYS 141—General Physics	4
One of the following	3-4
PHYS 142—General Physics	
BIOM 301—Introduction to Biometrics	
Any upper-level Geology course	

Credit hours-supporting requirement 23-24

*Of the normal CORE requirements (46 credit hours), at least 13-14 credits are met by the major requirements in Mathematics, Chemistry, Geology or Physics (Mathematics and the sciences area).

Combined B.S./M.S. Program in Geology

Normally, the minimum requirements for acceptance into this program are:

1. A GPA of at least 3.5
2. No more than 15 credits of required Geology courses and 4 credits of supporting requirements in mathematics, chemistry, and physics remaining for the B.S. Degree
3. No more than 6 credits of CORE requirements remaining for the B.S. degree
4. At least three letters of recommendation
5. An essay or statement of purpose
6. An interview with the Graduate Director

Advising

The director of the Undergraduate Program serves as the adviser for the geology majors, 3115 Geology Building, (301) 405-4078.

Honors

Admission to the honors program will be 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 Honor.

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. Six credit hours from the following:
 - 1) a three-credit-hour graduate-level course approved by the departmental honors committee,
 - 2) 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 (six 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)

College of Arts and Humanities

3215 Jimenez Hall, (301) 405-4091

Professor and Acting Chair: Oster
 Professors: Beicken, Oster, Pfister, Frederiksen†
 Associate Professors: Fleck, Strauch
 Emeriti: Best, Herin, Jones
 †Distinguished Scholar-Teacher

Changes in major requirements are under review. For more information, please contact the department at (301) 405-4091 or Dr. Pfister at (301) 405-4106.

The Major

The undergraduate major in Germanic Studies consists of 36 hours beyond the basic language acquisition sequence (GERM 101-201). No course completed with a grade lower than C may be used to satisfy the major requirements. Three program options lead to the Bachelor of Arts (B.A.) degree: 1) German language, 2) German literature, and 3) Germanic area studies. Secondary concentration and supportive electives are encouraged in the other foreign languages, comparative literature, English, history, and philosophy. Majors intending to go on to graduate study in the discipline are urged to develop a strong secondary concentration in a further area of Germanic studies; such "internal minors" are available in German language, German literature, Scandinavian studies, and Indo-European and

116 Government and Politics

Germanic philology. All majors must meet with a departmental adviser at least once each semester to update their departmental files and obtain written approval of their program of study.

Advising

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

Requirements for Major

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

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

German Language Option

CORE: 220, 301, 302, 321, and 322. Specialization: three of four German language courses (401, 403, 405, 419P); two 400-level German literature courses; two upper-level courses in any of the three areas of specialization.

German Literature Option

CORE: 220, 301, 302, 321, and 322. Specialization: five 400-level German literature courses; two upper-level courses in any of the three areas of specialization.

Germanic Area Studies Option

CORE: 220, 301, 302, 321, and 322. Modern Scandinavian Specialization: 369, 461; five upper-level courses in the Germanic area studies group. Medieval Scandinavian Specialization: 383, 475; five upper-level courses in the Germanic area studies group.

Also available is a German Business Option, an International Business-German Business Option, and an Engineering-German dual degree. Students should contact a departmental adviser for more information.

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

Honors in German

The department offers an extensive Honors Program for majors. The Honors Program affords Honors students sustained individual contact with faculty members. Honors Students are called on to work independently, to pursue a project that carries them beyond the regular undergraduate curriculum. Interested students should ask for detailed information from the department Honors Studies Director.

Course Code: GERM

GOVERNMENT AND POLITICS (GVPT)

College of Behavioral and Social Sciences

3140 Tydings Hall, (301) 405-4156
<http://www.bsos.umd.edu/gvpt>

Professor and Chair: Wilkenfeld

Professors: Alford[†], Alperovitz, Butterworth[†], Davidson, Dawisha, Elkin, Franda, Glass, Gurr, Harrison (Emeritus), Hathorn (Emeritus), Heisler, Herrnson, Marando, McNelly (Emeritus), Oppenheimer[†], Phillips, Piper, Pirages, Plischke (Emeritus), Quester, Stone, Terchek, Tismaneanu, Uslaner, Walters* (Afro-American Studies)

Associate Professors: Conca, Gimpel, Graber, Haufler, Kaminski, Lalman, McIntosh, Pearson, Soltan, Swistak, Telhami, Williams, Wilson* (Afro-American Studies)

Assistant Professors: Johnson* (Afro-American Studies), Matthes* (Women's Studies), Morris, Schreurs

Lecturer: Vietri

[†]Distinguished Scholar-Teacher

*Joint Appointment with unit indicated

The Department of Government and Politics offers programs for the general student as well as for students who are interested in careers in government, the public sector, politics, foreign assignments, teaching, a variety of graduate programs, and law schools. Satisfactory completion of

requirements leads to a Bachelor of Arts degree in government and politics.

The study of politics is both an ancient discipline and a modern social science. The origin of the discipline can be traced back to the earliest times when philosophers, statesmen, and citizens studied the nature of government, justice, responsibility, and the consequences of political action. More recently, the study of politics has also emphasized scientific analysis and methods of observations about politics. Today, the discipline reflects a broad effort to collect data about politics and governments utilizing relatively new techniques developed by all of the social sciences.

The Department of Government and Politics combines philosophical and scientific concerns in its overall program as well as in specific courses. It emphasizes such broad areas as political development, policy analysis, social justice, political economy, conflict, and human rights. These broad conceptual areas are integral components of study in the discipline. The areas are commonly referred to as American government and politics; comparative government; political theory; international relations; public administration; public law; public policy and political behavior.

Majoring in Government and Politics and the Academic Review

All majors are subject to an academic performance review. To meet the provisions of the review, students must complete (1) GVPT 100, GVPT 170, and ECON 200 with a minimum of two B's and one C for the three courses and (2) a minimum cumulative GPA of 2.0.

Freshman Majors and the Academic Review

Entering freshmen can gain admission to the Department of Government and Politics upon admission to the University. Such students are to pass the academic performance review (as identified above) by the time they have attempted 45 credits at the University. Students who do not meet this standard will be required to select another major.

Transfer Students and Transfer Majors. New transfer students to the University as well as on-campus students changing majors to Government and Politics with *fewer than 56 credits* will be required to meet the academic performance review (as identified above) by the time they have attempted 30 hours after transferring to the department. Those with *56 credits or more* will have to meet the performance review by the time they have attempted 15 hours after transferring to the department.

Appeals. Students who anticipate that they will be or who actually are unsuccessful in passing their performance review on time may appeal to the Director of Undergraduate Studies for a postponement of the review. Such appeals for postponement or second review will require documentation of unusual, extenuating, or special circumstances. The student will be notified in writing of the appeal decision.

Requirements for Major

Government and Politics majors must complete 36 semester hours of GVPT courses with a minimum grade of C in each course. At least 18 of the 36 credits must be in upper-level courses and all majors are required to complete GVPT 100, GVPT 170, and GVPT 241.

In addition, all majors must complete ECON 200, an approved skills option (a foreign language or three quantitative courses from a select list), and a secondary area of concentration in another department or approved interdisciplinary area. All courses used to satisfy these requirements must be completed with a minimum grade of C.

Honors Program

All students majoring in government may apply for admission to the GVPT Honors Program. Additional information concerning the Honors Program may be obtained at the department offices.

Internships

The department offers students a variety of internship experiences. Only nine hours of graded GVPT internship credit will apply to the 36 hours needed in the major. Internship credit graded on a pass/fail basis may not be used to satisfy the GVPT major requirements. In no case may more than 12 internship credits be counted towards the 120 credits needed to graduate. Internships are generally open only to GVPT majors with junior standing and a 3.0 GPA.

Advising

Academic advising is available daily on a walk-in or appointment basis in the Undergraduate Advising Office, 3140K Tydings Hall.

Course Code: GVPT

HEALTH EDUCATION (HLTH)

College of Health and Human Performance

2387 Health and Human Performances Building, (301) 405-2463

Professor and Chair: Wilson

Assistant Chair: Hyde

Professors: Beck, Burt, Feldman, Gold, Greenberg, Leviton, Wilson

Associate Professors: Boekeloo, Desmond, Meiners

Assistant Professors: Crump, Howard, Sawyer, Spalding, Thompson

Instructors: Hyde, Schiraldi

Faculty Research Assistants: Chu, Deale, Gobrecht, Harvey, Lusby, Marowski, Pinciario, Rotz, Stalmack, Stewart, Yentis

The Major

Students majoring in health education have two tracks to choose from at the undergraduate level. One option is Community Health Education, which prepares students for entry-level health education positions in community settings such as health associations, worksite health promotion programs, or other health agencies. The second option is School Health Education which prepares students for teaching health education in schools. Students are referred to the section on the College of Education in chapter 6 for information on teacher education application procedures.

Requirements for Major

Students must earn a grade of C or better in courses applied toward the major.

Health Education Major

The freshman and sophomore curricula for both the School Health Option and the Community Health Option are the same:

	Semester Credit Hours
Freshman Year	
CORE Requirement	6
ENGL 101—Introduction to Writing	3
MATH 110 OR MATH 102 AND 103 AND 105 OR 115: Mathematics	3
HLTH 140—Personal and Community Health	3
CHEM 121—Chemistry in Modern Life	3
BIOL 105—Principles of Biology I	4
HLTH 371—Communicating Health and Safety	3
PSYC 100—Introduction to Psychology	3
SOCY 100—Introduction to Sociology	3
HLTH 150—First Aid and Emergency Medical Services	2
Sophomore Year	
HLTH 230—Introduction to Health Behavior	6
PHIL 140—Contemporary Moral Issues	3
ZOOL 201, 202—Human Anatomy and Physiology I and II	4,4
Required Health Electives	6
PSYC 221—Social Psychology	3
HLTH 105—Science and Theory of Health	2
CORE Requirement	9

School Health

Junior Year

ENGL 391 or 393—Advanced Composition or Technical Writing	3
HLTH 420—Methods and Materials in Health Education	3
EDHD 300S—Human Development and Learning	6
EDCI 390—Principles and Methods of Secondary Education	3
Required Health Elective	3
EDHD 340—Human Development Aspects of the Helping Relationship	3
EDMS 410—Principles of Testing and Evaluation	3
EDCP 417—Group Dynamics and Leadership	3
CORE Requirement	3

Senior Year

HLTH 340—Curriculum, Instruction and Observation	3
Required Health Electives	6
EDPA 301—Foundations of Education	3
EDCI 491—Student Teaching in Secondary Schools Health	12
CORE Requirement	6

Community Health

Junior Year

ENGL 391 or 393—Advanced Composition or Technical Writing	3
MICB 100—Basic Microbiology	4
EDHD 340—Human Development Aspects of the Helping Relationship	3
EDMS 451—Introduction to Educational Statistics	3
HLTH 420—Methods and Materials in Health Education	3
HLTH 391—Introduction to Community Health	3
HLTH 437—Consumer Behavior	3
HLTH 430—Health Education in the Workplace	3
EDCP 417—Group Dynamics and Leadership	3
CORE Requirement	3

Senior Year

Required Health Electives	9
HLTH 490—Principles of Community Health	3
FMCD 483—Family and Community Service Systems	3
HLTH 491—Community Health Internship	12

Advising

Advising is mandatory. Undergraduate Health Education Adviser: 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

HEARING AND SPEECH SCIENCES (HESP)

College of Behavioral and Social Sciences

0100 LeFrak Hall, (301) 405-4214

E-mail: h-office@bss1.umd.edu

Associate Professor and Chair: Ratner

Professors: Gordon-Salant, McCall, Yeni-Komshian

Associate Professors: Ratner, Roth, Zeng

Assistant Professor: Haarmann

Instructors: Battles, Flack, McCabe, Palmer, Perloth, Walker, Worthington

Lecturer: Balfour

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 the M.A. 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.

118 History

Requirements for Major

Changes in requirements are under review.

A student majoring in hearing and speech sciences must complete 30 semester hours of required courses (HESP 202, HESP 300, HESP 305, HESP 311, HESP 400, HESP 402, HESP 403, HESP 404, 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, 12 semester hours of supporting courses in statistics and other related fields are required. For these 12 hours, a C average is required.

A guide to the major is available through the department office in room 0100, LeFrak.

Required courses for the HESP major:

HESP 202—Introduction to Hearing and Speech Sciences	3
HESP 300—Introduction to Psycholinguistics.....	3
HESP 305—Anatomy and Physiology of the Speech Mechanism	3
HESP 311—Anatomy, Physiology, and Pathology of the Auditory System ..	3
HESP 400—Speech and Language Development in Children.....	3
HESP 402—Speech Pathology I: Language Disorders in Children	3
HESP 403—Introduction to Phonetic Science.....	3
HESP 404—Speech Pathology II: Voice and Fluency Disorders	3
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 498—Seminar in Hearing and Speech Sciences	3
HESP 499—Independent Study	3

Allied/Related Fields (12 credits):

In addition to a required statistics course, the student will take nine credits from course offerings in Allied/Related Fields. A full list of these offerings is available in the Hearing and Speech Sciences Department undergraduate 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.

Special Opportunities

The department operates a Hearing and Speech Clinic, (301) 405-4218, that serves the campus and surrounding area, and provides an in-house opportunity for the clinical training of students. Department facilities also include several well-equipped research laboratories and a language preschool.

Student Organizations

Hearing and speech majors are invited to join the departmental 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
<http://www.inform.umd.edu/ARHU/Depts/History/>

Professor and Chair: Lampe

Professors: Barkley-Brown, Bedos-Rezak, Belz, Berlin^{††}, Brush[†], Callcott[†] (Emeritus), Cole[†] (Emeritus), Eckstein, Evans (Emeritus), Foust (Emeritus), Friedel, Gilbert[†], Gordon (Emeritus), Gullickson, Harlan^{†,††} (Emeritus), Harris, Henretta[†], Holum, Jashemski[†] (Emerita), Kent (Emeritus), A. Olson[†], K. Olson, Price, Smith (Emeritus), Sutherland, Warren (Emeritus),

Wright, Yaney (Emeritus), Zhang

Associate Professors: Breslow, Cooperman, David-Fox, Flack, Gerstle, Grimsted, Lapin, Majeska, Mayo, Moss, Muncy, Ridgway, Rowland, Rozenblit, Sumida, Ziffi

Assistant Professors: Bradbury, Bravman, Brooks, Gao, Lyons, Miller, Palmie, Sicilia, Wetzell, Williams

Adjunct: Carr, Papenfuse

Affiliate: Moses, Struna

[†]Distinguished Scholar-Teacher

^{††}Distinguished University Professor

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.

An undergraduate adviser assists each major in planning a curriculum to meet his or her personal interests. We encourage students to meet with an adviser, both in the department and in the College of Arts and Humanities, once every semester.

The department sponsors a History Undergraduate Association which majors and other interested students are encouraged to join. It also sponsors Phi Alpha Theta, study-abroad programs, and experiential learning (internships).

Requirements for Major

Requirements for the History major are 39 hours of history course work distributed as follows: 12 hours in 100-200 level introductory courses selected from at least two general geographical fields of history; 15 hours, including HIST 309, in one major area of concentration (see below); 12 hours of history in at least two major areas other than the area of concentration. All courses for the major must be completed with a minimum grade of C, and 15 hours of the 39 total hours must be at the junior-senior (300-400) level.

At least one course (three credits), must be taken from an approved list of courses on regions outside both Europe and the U.S. The list may be obtained from the History Undergraduate Adviser's Office.

I. Introductory Courses

1. The requirement is 12 hours at the 100-200 level taken in at least two geographical fields.
2. 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, including HIST 309, in a major area of concentration.
2. Students may choose an area of concentration that is either geographic, chronological, or thematic. Areas include:
 - a. Geographic regions: Latin America, Middle East, Britain and Western Europe, the United States, East Asia, Africa, Eastern Europe and Russia;
 - b. Chronological periods: ancient world, medieval Europe, and early modern Europe
 - c. Themes: science and technology, social and cultural, women and gender, African-American, Jewish, military, and business.
3. The proseminar, HIST 309, should normally be taken in the major area of concentration in the senior year *after* completing two or three upper-level courses in the area of concentration.

III. 12 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. 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 that 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)

College of Agriculture and Natural Resources

Department of Natural Resource Sciences and Landscape Architecture

2102 Plant Sciences Building, (301) 405-4351, (301) 405-4355

E-mail: kh26@umail.umd.edu; cw5@umail.umd.edu

<http://www.agnr.umd.edu/users/nrsl/>

Professor and Chair: Weismiller

Professors: Ng, Quebedeaux, Solomos, Walsh

Associate Professors: Beste, Bouwkamp, Deitzer, McClurg, Swartz

Assistant Professors: Coleman, Everts, Hill, Hilsenrath, Lea-Cox, J.B.

Sullivan, J.H. Sullivan

Affiliate Professor: Balge

Adjunct Assistant Professor: Pooler

Instructors: Mityga, Nola

Professors Emeriti: Gouin, Link, Oliver, Shanks, Stark, Thompson, Wiley

The Major

The Department of Natural Resource Sciences and Landscape Architecture offers five undergraduate majors. Four lead to a bachelor of science (B.S.) degree and one leads to a bachelor of landscape architecture (B.L.A.) degree. See entry on Landscape Architecture later in this chapter.

Students majoring in Horticulture are required to study fundamental science as a basis for solving problems of world food supply and environmental concerns. Horticulture is a diverse profession that has programs ranging from fruit, vegetable, floral and nursery crop production to urban forestry and landscape management. It requires a broad knowledge of plant diversity, physiology, biochemistry, molecular biology and environmental ecology. Horticulture graduates are in high demand worldwide in traditional agricultural production as well as in the growing fields of biotechnology and bioremediation. Horticulture majors may choose from three options: Horticultural Production, Horticultural Science and Landscape Management. These majors prepare students for entry into horticultural and landscape related industries or for graduate study.

Curriculum in Horticulture (B.S.)

Horticulture Major

Requirements—All Horticulture Options	Semester Credit Hours
AGRO 202—Fundamentals of Soil Science	4
CHEM 103—General Chemistry I	4
ENTM 205—Principles of Entomology	4
MATH 115—Precalculus	3
PBIO 365—Introductory Plant Pathology	4
HORT 100—Introduction to Horticulture	4
HORT 202—Management of Horticultural Crop Production	4
HORT 271—Plant Propagation	3
HORT 398—Seminar	1

Horticultural Production Option

AGRO 411—Principles of Soil Fertility	3
AGRO 453—Weed Science	3
AREC 250—Elements of Agricultural and Resource Economics	3
AREC 306—Farm Management OR	
AREC 414—Agricultural Business Management	3

CHEM 104—Fundamentals of Organic and Biochemistry	4
PBIO 420—Plant Physiology	4
HORT 201—Environmental Factors in Horticultural Crop Production	4
HORT 389—Horticultural Internship	3
HORT 474—Physiology of Maturation and Storage of Horticultural Crops	3

Advanced Production Electives (Select four of the following)

AGRO 305—Introduction to Turf Management	3
ENTM 453—Insect Pests of Ornamentals and Turf	3
HORT 432—Greenhouse Crop Production	3
HORT 433—Technology of Fruit and Vegetable Crop Production	4
HORT 452—Principles of Landscape Establishment and Maintenance	3
HORT 456—Nursery Crop Production	3
HORT 472—Advanced Plant Production	2

Total Horticultural Production Option requirements and electives	73
Additional CORE Program requirements	27
University Electives	20

Horticultural Science Option

BIOL 105A—Principles of Biology I	4
BIOL 222—Principles of Genetics	4
CHEM 113—General Chemistry II	4
CHEM 233—Organic Chemistry I	4
MATH 220—Elementary Calculus I	3
HORT 201—Environmental Factors in Horticultural Crop Production OR	
PBIO 200—Introductory Plant Biology	4
PBIO 420—Plant Physiology	4
PHYS 121—Fundamentals of Physics I	4
HORT 399—Special Problems	2
HORT 472—Advanced Plant Propagation	2
HORT 474—Physiology of Maturation and Storage of Horticultural Crops	3

Advanced Horticulture Electives (Select one of the following)

HORT 432—Greenhouse Crop Production	3
HORT 433—Technology of Fruit and Vegetable Crop Production	4
HORT 452—Principles of Landscape Establishment and Maintenance	3
HORT 456—Nursery Crop Production	3

Advanced Science Electives (Select one of the following)

AGRO 403—Crop Breeding	3
AGRO 411—Principles of Soil Fertility	3
AGRO 417—Soil Physics	3
AGRO 421—Soil Chemistry	4
BCHM 261—Elements of Biochemistry	3
PBIO 410—Plant Biochemistry	4
PHYS 122—Fundamentals of Physics II	3

Total Horticulture Science Option Requirements and Electives	76-78
Additional CORE Program requirements	27
University Electives	15-17

Landscape Management Option

AGRO 305—Introduction to Turf Management, OR	
AGRO 411—Principles of Soil Fertility	3
AREC 250—Elements of Agricultural and Resource Economics	3
AREC 306—Farm Management, OR	
BMGT 353—Retail Management	3
BMGT 220—Principles of Accounting	3
BMGT 350—Marketing Principles and Organization	3
CHEM 104—Fundamentals of Organic and Biochemistry	4
LARC 140—Graphic Fundamentals	3
LARC 160—Introduction to Landscape Architecture	3
HORT 200—Land Surveying	2
HORT 201—Environmental Factors in Horticultural Crop Production	4
HORT 253—Woody Plant Material I	3
HORT 254—Woody Plant Material II	3
HORT 255—Landscape Design and Implementation	4
HORT 320—Principles of Site Engineering	4
HORT 389—Horticultural Internship	3
HORT 452—Principles of Landscape Establishment and Maintenance	3
HORT 321—Landscape Structures and Materials	3

Total Landscape Management Option requirements	85
Additional CORE Program requirements	21
University Electives	14

120 Human Development

Internship Opportunities

Internships with scientists are available at nearby federal and state agencies as well as in private industry.

Student Organizations

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

Several scholarships and awards are available to Horticulture students. Contact the Associate Dean's office at (301) 405-2078 for additional information.

Course Code: HORT

HUMAN DEVELOPMENT (Institute for Child Study) (EDHD)

College of Education

3304 Benjamin Building, (301) 405-2827

Professor and Chair: Porges

Professors: Alexander, Eliot, Fein, Fox, Guthrie, Hardy, Rubin, Seefeldt[†], Torney-Purta

Associate Professors: Bennett, Byrnes, Flatter, Gardner, Killen, Klein, Marcus, Nettles, Robertson-Tchabo, Wentzel, Wigfield

Assistant Professors: Green, Jones, Metsala, Smith

Emeriti: Bowie, Dittman[†], Goering, Hatfield, Huebner, Morgan[†], Tyler

[†]Distinguished Scholar-Teacher

HUMAN NUTRITION AND FOOD SYSTEMS

For information, consult the Nutrition and Food Science entry elsewhere in this chapter.

HUMAN RESOURCE MANAGEMENT

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

JEWISH STUDIES PROGRAM (JWST)

College of Arts and Humanities
0113 Woods Hall, (301) 405-4975

Director: Marsha Rozenblit
Professors: Beck, Berlin, Handelman
Associate Professors: Cooperman, Lapin, Manekin, Rozenblit
Assistant Professor: Fradkin
Instructors: Gur, Lewy

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 for second-semester sophomores and seniors.

Requirements for Major

Requirements for the Jewish Studies major include the College of Arts and Humanities requirement of 45 upper-level credits completed. The College foreign-language requirement will be automatically fulfilled in the process of taking Hebrew language courses. The undergraduate major requires 48 semester hours (27 hours minimum at 300-400 level) in Jewish Studies. These courses may include courses offered by Jewish Studies or cross-listed by Jewish Studies with the Departments of Asian and East European Languages and Literatures, History, Philosophy, English, Women's Studies, and Comparative Literature.

A minimum grade of C is required in all courses offered toward major requirements. A major in Jewish Studies will normally conform to the following curriculum:

1. Prerequisite: HEBR 111, 112, 211, 212 (or placement exam)
2. Required courses: HEBR 313, 314; JWST 234, 235, and 309; one course in classical Jewish literature (200-level); one upper-level course in Hebrew literature in which the text and/or language of instruction are in Hebrew. (21 credit hours)
3. Electives: 15 credits in Jewish Studies courses. At least nine credits must be at the 300-400 level.
4. Twelve credits of supporting courses in areas outside Jewish Studies such as history, sociology, philosophy, psychology, or literature, including at least six credits at the 300-400 level, to be selected with the approval of a faculty adviser.

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

Professor and Chair: Franks
Associate Chair: Phillips
Professors: Clark, Dotson, Ennis, Franks, Hagberg, Hurley, Iso-Ahola, Struna
Associate Professors: Hatfield, Phillips, Rogers, Wrenn
Assistant Professors: Brown, Jeka, McDaniel, VanderVelden
Lecturers: Mason, Owens
Instructors: Brown, Scott
Emeriti: Clarke, Eyler, Hult, Humphrey, Husman, Steel

The Major

The Department of Kinesiology offers two undergraduate degree programs to satisfy different needs of students. Students may choose to major in Physical Education or in Kinesiological Sciences. Brief descriptions of each program follow. Students should obtain a current Student Handbook for the degree program of interest (available in HHP 2351 and 2338). The Student Handbook details important course sequences, suggested courses for each year, and applicable policies. Both programs require a grade of C or better in all required coursework. Departmental contacts are Mrs. Lynn Owens for Physical Education (301-405-2495, lo8@uemail.umd.edu) and Dr. Marvin Scott for Kinesiological Sciences (301-405-2480, ms24@uemail.umd.edu)

In addition to University general education (CORE) classes, 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 K-12 teacher certification in Maryland. Maryland teaching certificates are reciprocal with most other states. While this program is designed to provide preparation for individuals in public school settings, it also provides an excellent preparation for those wishing to pursue other professional opportunities in sport, exercise, or physical activity. Also, due to the strong 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 proper sequencing and prerequisites. 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.

Physical Education Degree Requirements

Freshman Year

BIOL 105—Principles of Biology	4
KNES 180—Foundations of Physical Education	2
KNES 182—Rhythmic Activities	2
KNES 183—Movement Content for ES Children	3
KNES 200—Gymnastics Skills Lab	2
KNES 202/210—Badminton/Field games Skills Lab	2
KNES 204—Basketball/T&F Skills Lab	2
KNES 217/221—Volleyball/Tennis Skills Lab	2
KNES 223—Wt Train/Aerobic Skills Lab	2

Sophomore Year

ZOOL 201, 202—Anatomy and Physiology I	8
KNES 314—Methods in PE	3
KNES 287, 293, 370	9

122 Landscape Architecture

Junior Year

KNES 371—ESPE: A Movement Approach	3
KNES 333—Physical Activity for Handicapped	3
KNES 282—Basic Care and Prevention of Athletic Injuries	3
EDHD 300S—Human Dev & Learning OR	6
EDHD 413—Adoles. Dev AND	
EDHD 420—Cognitive Dev and Learning	
KNES 300, 350, 360, 385.....	13

Senior Year

KNES 390—Practicum in Teaching PE.....	3
KNES 491—Curriculum in PE	3
KNES 480—Measurement in PE	3
EDCI 390—Prin & Methods of Sec Ed.....	3
EDPA 301—Foundations of Education.....	3
EDCI 485—Student Teaching in Elem PE.....	6
EDCI 495—Student Teaching in Sec PE	6

Minimum total semester hours for program = 126 credits, including the CORE (general education) Program.

Admission to Teaching

Admission to the College of Education is required upon completion of 45 applicable credits. Students must pass the National Teachers Exam and have a 2.5 GPA after 45 credits to gain admission. Additional information is available from the College of Education.

Kinesiological Sciences Major

This curriculum offers students the opportunity to study the body of knowledge of human movement and sport, and to develop specific programs of study which allow them to pursue a particular goal related to the discipline. There is no intent to orient all students toward a particular specialized interest or orientation. However, many currently enrolled students are pursuing careers in medically-related fields (i.e., physical therapy, physician, chiropractor) and in the fitness industry (i.e., corporate fitness, personal training, fitness club management) as well in the applied social sciences. The program provides a hierarchical approach to the study of human movement. First, a broad core of knowledge is recognized as being necessary for all students in the curriculum. These core courses are considered foundational 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 goal they set for themselves in the future. To further strengthen specific areas of interest, students should carefully select electives.

Kinesiological Sciences Degree Requirements

	Credits
University Core	40
(Includes BIOL 105, ZOOL 201)	
KNES Core (287, 293, 300, 350, 360, 370, 385).....	22
Other required courses	10
(ZOOL 202, KNES 497, statistics)	
KNES Option classes	12
(see Bulletin Board in Department or Handbook)	
Physical Activity Courses (see Handbook)	8
Electives (see Handbook, some restrictions)	28
*Students should discuss these requirements with a department adviser.	

Minimum total semester hours for program = 120 credits, including the CORE (general education) Program.

Advising

Advising is strongly recommended for all students majoring in either Physical Education or Kinesiological Sciences, although it is not mandatory. Students are assigned an advisor to assist them with registration procedures, program updates and other information. Students are advised to closely follow the program sheets which outline the order in which courses should be taken to allow proper and timely progression through the degree programs.

Honors

The 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 courses and a thesis, which will be

defended before a faculty committee. Applicants must have a 3.5 overall GPA on a minimum of 45 credits and a 3.5 GPA on at least nine credits from the Kinesiology CORE. The faculty Honors Committee also will consider leadership, motivation and maturity for admission consideration. 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

Course Code: KNES

LANDSCAPE ARCHITECTURE (LARC)

College of Agriculture and Natural Resources

Department of Natural Resource Sciences and Landscape Architecture

2146 Plant Sciences Bldg., (301) 405-4350

E-mail: mh160@umail.umd.edu

<http://www.agnr.umd.edu/users/nrsl/>

Professor and Acting Chair: Weismiller
Assistant Professor and Coordinator: Hill
Assistant Professors: Hilsenrath, J. B. Sullivan
Adjunct Assistant Professor: Foster

The Major

The Department of Natural Resource Sciences and Landscape Architecture offers five undergraduate majors. Four lead to a bachelor of science (B.S.) degree and one leads to a bachelor of landscape architecture (B.L.A.) degree.

The landscape architecture curriculum is a four-year professional program. The program is primarily a site-based design discipline that also deals with regional and larger-scale environmental issues. The curriculum, a studio-based design program, integrates natural and social factor analysis into the design process. Digital design studios allow the integration of computer-aided design with fundamental design and drawing skills.

Admission

Landscape architecture is a limited-enrollment program (LEP). See Chapter 1 of this 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. Fifteen spaces in the first year program are reserved for freshmen. Most entering freshmen who have a GPA of 2.70 and a SAT score of 1100 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: Five spaces in the first year program are tentatively held for transfer students. Transfer students must meet the following minimum requirements: GPA = 2.70 with grades of C or better in LARC 160, MATH 115, and an acceptable 4 credit plant sciences course with a laboratory (HORT 100, HORT 201, HORT 202, AGRO 101, BIOL 105, BIOL 106, PBIO 200). Students presenting an acceptable portfolio evaluated by the landscape architecture faculty may be exempted from one or both of the first year studios.

45 credit review. All students will be subjected to a performance review after they have completed 45 credits hours. To meet the provisions of the review, students must complete: (1) CORE Fundamental Studies; (2) 3 courses in CORE Distributive Studies; (3) LARC 160, 140, 141, 240, 220, MATH 115, HORT 253, and an acceptable 4 credit plant sciences course with a laboratory (HORT 100, HORT 201, HORT 202, AGRO 101, BIOL 105, BIOL 106, PBIO 200) with minimum grades of C. 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.

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

124 Materials and Nuclear Engineering

MANAGEMENT SCIENCE AND STATISTICS

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 AND NUCLEAR ENGINEERING (ENMA, ENNU)

A. James Clark School of Engineering

Materials Science and Engineering (ENMA)

2135 Chemical and Nuclear Engineering Building, (301) 405-5208

<http://www.mne.umd.edu>

Chair: Christou

Professors: Armstrong*, Arsenault, Christou, Dieter* (emeritus), Roytburd, Rubloff, Smith (emeritus), Wuttig, Yeh

Associate Professors: Ankem, Briber, Lloyd (associate chair), Martinez-Miranda, Ramesh, Salamanca-Riba

Assistant Professors: Kidder, Kofinas, Wilson

Adjunct: Hsu, Lawn

*Member of Mechanical Engineering Department

The Major

The development, production and use of novel materials has become a major issue in all fields of engineering. Materials which are strong and light at the same time are needed for space structures; faster electro-optical switching materials will result in improved mass communications; and stronger high temperature plastics would improve the efficiency of transportation systems. The mission of the materials science and engineering program is to provide the student with an interdisciplinary science-based education to understand the structure and resulting properties of metallic, ceramic, polymeric materials and electronic materials. Students will gain the ability to solve problems in the design, processing and use of advanced materials. Students will have the opportunity to work with faculty and industry on complex problems through projects, internships, and research and co-op experiences. A wide variety of careers are open to graduates of this program ranging from production and quality control in the traditional materials industries to the molecular construction of electronic materials in ultra-clean environments, and to the applications of materials in electronic packages. The application of materials to solve environmental, energy, and reliability problems are also career options.

Students may major in the Bachelor of Science in Materials Science and Engineering Program or may use Materials Engineering as a field of concentration in the Bachelor of Science in Engineering Program.

Requirements for Major

Requirements for the Materials Science and Engineering major include thorough preparation in mathematics, chemistry, physics, and engineering science as well as the required University general education (CORE) requirements. All students will be required to select an area of specialization, an upper-class science elective, and two technical electives. A total 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 133—General Chemistry	4	
MATH 140—Calculus I	4	
MATH 141—Calculus II	4	
ENGL 101—Introduction to Writing	3	
ENES 102—Statics	2	
PHYS 161—General Physics I	3	
Total	14 (15)	15

*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 polymers

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	3	
ENMA 363—Microprocessing of Materials	3	
ENMA 460—Physics of Solid Materials	3	
ENMA 461—Thermodynamics of Materials	3	
Specialization Electives	3	3
Total	15	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	6	
ENRE 489B—Principles of Quality and Reliability	3	
Upper-level science elective	3	
Total	18	15

Minimum Degree Credits: 120 credits and the fulfillment of all department, school, and university requirements.

Four suggested specialization areas follow. Students are expected to take four specialization electives in one particular area during their junior and senior years after consulting with their adviser.

Materials Science: ENMA 464—Environmental Effects; ENMA 420—Intermediate Ceramics; ENMA 489C—Electronic Packing Materials; ENMA 495—Polymeric Materials; ENMA 489X—Electronic Materials; ENMA 499—Laboratory Projects

Applications of Materials and Manufacturing: ENMA 472—Technology and design of Engineering Materials; ENMA 489A—Design of Composites; ENMA 489L—Manufacturing Ceramics; ENMA 489R—Manufacturing Polymers; ENME 400—Machine Design; ENMA 412—Mechanical Design for Manufacturing; ENME 465—Fracture Mechanics; ENAE 424—Design and Manufacturing of Composites and Prototypes; ENMA 499—Laboratory Projects

Organic Materials: ENMA 495—Polymeric Materials; ENMA 496—Processing of Polymers; ENCH 490—Introduction to Polymer Chemistry; ENMA 489R—Manufacturing Polymers; ENCH 494—Polymer Technology Laboratory; ENMA 499—Laboratory Projects

Electrical and Electronic Materials: ENMA 481—Introduction to Electronic and Magnetic Materials; ENMA 489C—Electronic Packing Materials; ENEE 302—Digital Circuits; ENEE 460—Control Systems; ENEE 480—Fundamentals of Solid State Electronics.

Admission

All Materials Engineering students must meet admission, progress, and retention standards of the A. James Clark School of Engineering.

Advising

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.

Honors and Awards

Each of the large number of professional-materials-oriented societies such as the metallurgical and ceramic societies sponsor awards to recognize outstanding scholarship and undergraduate research. All students enrolled in the materials engineering program are encouraged to select a faculty adviser who in their junior and senior years will guide them towards nomination for these awards.

Student organization: There is an active student chapter of The Minerals, Metals & Materials Society (TMS).

Course Code: ENMA

Nuclear Engineering Program (ENNU)

2309 Chemical and Nuclear Engineering Building, (301) 405-5227
<http://www.mne.umd.edu>

Professor and Chair: Christou
 Professors: Christou, Modarres†, Mosleh, Roush, Wolf
 Associate Professor: Pertmer
 Assistant Professors: Al-Sheikhly, Gavrilas
 Emeriti: Duffy, Hsu, Munno, Silverman, Almenas
 † Distinguished Scholar-Teacher

The Major

Nuclear and radiation engineering combines applied and fundamental science with the most advanced technologies available today. The discipline contributes to our lives through medical procedures, diagnoses of the structural integrity of airplanes and bridges, advanced materials manufacturing, non-polluting electricity generation, space exploration, environmental restoration, and of course, smoke detectors. All of these, and many other applications, utilize nuclear technology. The mission of the nuclear engineering program is to provide the student with an interdisciplinary education which allows the graduate to attain the skills necessary to meet the challenges of future technologies. Students gain the ability to apply knowledge of radiation engineering, reactor neutronics, radiation interactions with matter, and nuclear system safety to solve current and future problems in a wide variety of areas. Students have the opportunity to work with faculty and industry on 'real world' problems through research projects, internships, and co-op experiences. Because of the wide range of uses of nuclear and radiation technologies, the nuclear engineer finds interesting and challenging opportunities in industry, government, and research laboratories, with careers ranging from electricity generation to materials development, to applications of ionizing radiation in manufacturing processes and health industries.

Requirements for Major

The curriculum is composed of: (1) the required University general education (CORE) requirements; (2) a core of mathematics, physics, chemistry, and engineering sciences required of all engineering students; (3) 15 credits of courses selected within a secondary field; (4) 27 credits of nuclear engineering courses including ENNU 215, 441, 442, 443, 450, 455, 465, 480, 485, 490, and 495; (5) the course on environmental effects on materials, ENMA 464. A maximum degree of flexibility has been retained so that the student and adviser can select a number of elective courses. A sample program follows.

	Semester Credit Hours	
	I	II
Freshman Year		
MATH 140—Calculus I.....	4	
MATH 141—Calculus II		4
PHYS 161—General Physics		3
ENES 100—Introduction to Engineering Design	3	

ENES 102—Statics	2
CHEM 133—Chemistry for Engineers	4
CORE Program Requirements (including ENGL 101)	3
Total	14

Sophomore Year

MATH 241—Calculus III	4
MATH 246—Differential Equations.....	3
PHYS 262,263—General Physics.....	4
ENES 230—Intro. to Materials and Their Applications.....	3
ENME 232—Thermodynamics (or equivalent)	3
ENES 221—Dynamics	3
ENNU 215—Intro. to Nuclear Technology	3
CORE Program Requirements	3
Total	14

Junior Year

ENNU 441, 442—Nuclear Engineering Laboratory I, II.....	1
ENNU 450—Nuclear Reactor Engineering I	3
ENNU 455—Nuclear Reactor Engineering II	3
ENME 331—Fluid Mechanics (or equivalent)	3
ENME 332—Transfer Processes (or equivalent).....	3
ENMA 464—Environmental Effects on Engineering Materials	3
ESEE 300—Principles of Electrical Engineering	3
ENGL 393—Technical Writing	3
Math-Physical Science Elective	3
CORE Program Requirements	3
Total	16

Senior Year

ENNU 443—Nuclear Engineering Laboratory III.....	1
ENNU 465—Nuclear Reactor Systems Analysis	3
ENNU 480—Reactor CORE Design	3
ENNU 485—Nuclear Reactor Thermalhydraulics	3
ENNU 490—Nuclear Fuel and Power Management.....	3
ENNU 495—Design in Nuclear Engineering	3
Engineering Electives	6
CORE Program Requirements	3
Total	16

Minimum Degree Credits: 120 credits and fulfillment of all department, school, and University requirements. Students must consult with an adviser on selection of appropriate courses for their particular course of study.

Admission

All Nuclear Engineering students must meet admission, progress and retention standards of the A. James Clark School of Engineering.

Co-op Program

The nuclear engineering program works within the A. James Clark School of Engineering Cooperative Engineering Education Program. For information on this program, see the A. James Clark School of Engineering entry in chapter 6 of this catalog, or call the department office at 405-5208.

Advising

Students choosing nuclear engineering as their primary field should follow the listed curriculum for nuclear engineers. They should submit a complete program of courses for approval during their junior year. Students electing nuclear engineering as their secondary field should seek advice from a member of the nuclear engineering faculty prior to their sophomore year. Contact Ms. Parvathi Narayan, the Undergraduate Secretary, Room 2309, Chemical and Nuclear Engineering Building, at (301) 405-5209 or call Professor Pertmer, the Undergraduate Advisor, at (301) 405-5227 to schedule an appointment.

Financial Assistance

Financial aid based upon need is available through the Office of Student Financial Aid. A number of scholarships are available through the A. James Clark School of Engineering. Part-time employment is available in the department. Of particular interest are scholarships available to qualified students at all undergraduate levels from the Institute for Nuclear Power Operations, the US Department of Energy and the American Nuclear Society. Faculty merit scholarships are offered to outstanding students by the department.

Honors and Awards

Annual awards are given to recognize scholarship and outstanding service to the department, school and university. These awards include the American Nuclear Society Award for Leadership and Service and the Award for Outstanding Contribution to the ANS Student Chapter.

Student Organization

Students operate a campus student chapter of the professional organization, the American Nuclear Society.

Course Code: ENNU

MATHEMATICS (MATH)

College of Computer, Mathematical and Physical Sciences
1117 Mathematics Building, Undergraduate Office, (301) 405-5053

Professor and Chair: Fitzpatrick

Professors: J. Adams, Antman, Auslander, Benedetto, Berenstein, Boyle, Brin, Chu, Cohen, J. Cooper, Ellis, Fey**, Freidlin, Glaz, Goldberg, Goldman, Grebogi*, Green, Greenberg, Grillakis, Gromov, Grove, Gulick, Hamilton, Herb, Herman, Jacobson, Johnson, Kagan, Kedem, King, Kleppner, Kudla, Kueker, Lay†, Li, Lipsman****, Lopez-Escobar, Machedon, Millson, Neri, Nochetto, Novikov††, Osborn, Pego, Rosenberg, Rudolph†, Schafer, Slud, Sweet, Syski, Washington, Wolfe, Wolpert†, Yang, Yorke††***, Zedek

Associate Professors: Berg, Chang, Coombes, Dancis, Helzer, Laskowski, Lee, Liu, Sather, Schneider, Schwartz, Smith, Stuck, von Petersdorff, Warner, Winkelkemper, Wu

Assistant Professors: D. Cooper**, Hunt, Iozzi, Li, Qin, Stevenson
Professors Emeriti: Babuskat†, Brace, Correl, Edmundson, Ehrlich, Goldhaber, Good, Heins, Horvath, Hubbard, Hummel, Kellogg, Kirwan, Lehner, Markley, Olver, Owings, Stellmacher

Affiliate Professors: O'Leary, Stewart, Young

Adjunct Professor: Rinzel

†Distinguished Scholar-Teacher

††Distinguished University Professor

*Joint Appointment: IPST and Institute for Plasma Research

**Joint Appointment: Department of Curriculum and Instruction

***Joint Appointment: IPST

****Associate Dean, CMPS

The program in mathematics leads to a degree of Bachelor of Science (B.S.) in mathematics and offers students training in the mathematical sciences in preparation for graduate work, teaching, and positions in government or industry.

Requirements for Major

Each mathematics major must complete, with a grade of C or better in each course, the following:

- The introductory sequence MATH 140, 141, 240, 241 or the corresponding honors sequence MATH 350–351 (previously MATH 250–251).
- Eight MATH/MAPL/STAT courses at the 400-level or higher, at least four of which are taken at College Park. The eight courses must include:
 - At least one course from MATH 401, 403, 405.
 - At least one course from MATH 246, 414, 415, 436, 462. If MATH 246 is chosen, it will not count as one of the eight Upper-level courses.
 - One course from MAPL 460, 466. (This assumes knowledge of CMSC 104 or equivalent.)
 - MATH 410 (completion of MATH 350–351 [previously MATH 250–251] exempts the student from this requirement and (e) below; students receive credit for two 400-level courses.) Students are strongly encouraged to complete MATH 310 prior to attempting MATH 410.
 - A one-year sequence which develops a particular area of mathematics in depth, chosen from the following list:
 - MATH 410–411
 - MATH 403–404
 - MATH 446–447
 - STAT 410–420.
 - MATH/MAPL 472–473
 - The remaining 400-level MATH/MAPL/STAT courses are electives, but cannot include any of: MATH 400, 461,

478–488, or STAT 464. EDCI 451 may be used to replace one of the upper-level elective courses. 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.

- 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.
 - PHYS 161-262-263
 - PHYS 171–272–273
 - PHYS 141–142, and an upper-level physics course approved by the Mathematics Department
- ENES 102, PHYS 161, ENES 220
- CMSC 112–113, and one of CMSC 311–330
 - CMSC 112–150–251
 - CMSC 114–214 and one of CMSC 311, 330
 - CMSC 114–150–251
- CHEM 103–113, and one of CHEM 227, 233
- ECON 200–201 (previously ECON 201–203), and one of ECON 305 or 306
- BMGT 220–221–340.

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.

- Pure mathematics: the courses which clearly belong in this area are: MATH 402, 403, 404, 405, 406, 410, 411, 414, 415, 417, 430, 432, 436, 437, 445, 446, 447, 452, STAT 410, 411, 420. Students preparing for graduate school in mathematics should include MATH 403, 405, 410 and 411 in their programs. MATH 463 (or 660) and MATH 432 (or 730) are also desirable. Other courses from the above list and graduate courses are also appropriate.
- Secondary teaching: the following courses are required to teach mathematics at the secondary level: MATH 402 or 403, 430 and EDCI 451. (EDCI 451 is acceptable as one of the eight upper-level math courses required for a mathematics major.) These additional courses are particularly suited for students preparing to teach: MATH 406, 445, 463, STAT 400 and 401. EDHD 300, EDPA 301, EDCI 350 or 455, and EDCI 390 are necessary to teach; before registering for these courses, the student must apply for and be admitted to teacher education.
- Statistics: For a student with a Bachelor of Arts 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 at least two more statistics courses, most suitably, STAT 440 and STAT 450. A stronger sequence is STAT 410, 420, 450. This offers a better understanding and wider knowledge of statistics and is a general purpose program (i.e., does not specify one area of application). For economics applications STAT 400, 401, 440, 450, and MAPL 477 should be considered. For operations research MAPL 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 411, 440, 450 added at some later stage.
- Computational mathematics: there are a number of math courses which emphasize the computational aspects of mathematics including the use of the computer. They are MAPL 460, 466, 467, 477, and MATH 450, 475. Students interested in this area should take CMSC 114, 214 as early as possible, and CMSC 420, 211 are also suggested.
- Applied mathematics: the courses which lead most rapidly to applications are the courses listed above in 3 and 4 and MATH 401, 414, 415, 436, 462, 463, 464, and MATH/MAPL 472 and 473. A student interested in applied mathematics should obtain, in addition to a solid training in mathematics, a good knowledge of at least one area in which mathematics is currently being applied. Concentration in this area is good preparation for employment in government and industry or for graduate study in applied mathematics.

Advising

Advising for math majors is mandatory. Students are required to sign up for an advising appointment at the math undergraduate office window (1117 Mathematics Building), beginning the week before preregistration.

Honors

The Mathematics Honors Program is designed for students showing exceptional ability and interest in mathematics. Its aim is to give a student the best possible mathematics education. Participants are selected by the Departmental Honors Committee during the first semester of their junior year. A precise statement of the requirements may be found in the Math Undergraduate Office.

The department also offers a special mathematics department honors analysis sequence (MATH 350–351, previously MATH 250-251) 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 Departmental Honors Committee 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).

The mathematics departmental honors calculus sequence and the University Honors Program are distinct, and enrollment in one does not imply acceptance in the other. Neither honors calculus sequence is a prerequisite for participating in the Mathematics Honors Program, and students in these sequences need not be mathematics majors.

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.

Higginbotham Prize: A monetary award is made to an outstanding junior math major in the spring.

Carol Karp Award: A monetary award is made to a senior math major for an outstanding achievement in logic.

Milton Abramowitz Award: A monetary award is made to an outstanding senior math major in the spring.

Placement in Mathematics Courses

The Department of Mathematics has a large offering to accommodate a great variety of backgrounds, interests, and abilities. The department permits students to take any course for which they have the appropriate background, regardless of formal course work. For example, students with a high school calculus course may be permitted to begin in the middle of the calculus sequence even if they do not have advanced standing. Students may obtain undergraduate credit for mathematics courses in any of the following ways: passing the appropriate CEEB Advanced Placement Examination, passing standardized CLEP examinations, and through the department's Credit-by-Examination. Students are urged to consult with advisers from the Department of Mathematics to assist with proper placements.

Statistics and Probability and Applied Mathematics

Courses in statistics and probability and applied mathematics are offered by the Department of Mathematics. These courses are open to non-majors as well as majors, and carry credit in mathematics. Students wishing to concentrate in the above may do so by choosing an appropriate program under the Department of Mathematics.

Mathematics Education

Students completing an undergraduate major in mathematics and planning to be certified to teach should contact the College of Education.

Course Codes: MATH, STAT, MAPL

MEASUREMENT, STATISTICS, AND EVALUATION (EDMS)

College of Education

1230 Benjamin Building, (301) 405-3624

<http://www.inform.umd.edu:8080/EdRes/Colleges/EDUC/Depts/EDMS>

Professor and Chair: Lissitz

Professors: Dayton, Macready, Stunkand (Emeritus)

Associate Professors: Hancock, Johnson, Schafer

For Advanced Undergraduates and Graduates

The Department of Measurement, Statistics, and Evaluation offers courses in classroom assessment, applied statistics, and computer-based simulation (Monte Carlo method) for undergraduates. These courses provide a foundation in methods that are very useful for most career choices. The department is primarily graduate-oriented and offers programs at the master's and doctoral levels for persons with quantitative interests from a variety of social science and professional backgrounds. In addition, a doctoral minor is offered for students majoring in other areas. The doctoral major is intended primarily to produce individuals qualified to teach courses at the college level in measurement, applied statistics and evaluation, generate original research and serve as specialists in measurement, applied statistics or evaluation in school systems, industry or government. The master's program is designed to provide individuals with a broad range of data management, analysis and computer skills necessary to serve as research associates in academia, government, and business. At the doctoral level, a student may choose a specialty within one of three areas: theoretical measurement, applied statistics, and program evaluation. Undergraduates may begin course work for the M.A. while still pursuing the B.A., subject to departmental approval.

Course Code: EDMS

MECHANICAL ENGINEERING (ENME)

A. James Clark School of Engineering

2181 Engineering Classroom Building, (301) 405-2410

<http://www.enme.umd.edu/>

Professor and Chair: Anand

Associate Chair: diMarzo

Director, Undergraduate Studies: Ainane

Professors: Anand, Barker, Baz, Bernard, diMarzo, Duncan, Fournay, Gupta, A., Holloway, Magrab, Ohadi, Pecht, Radermacher, Tsai, Wallace

Associate Professors: Azarm, Balachandran, Bigio, Dasgupta, Herold, Joshi, Piomelli, Sandborn, Shih, Sirkis, Wang, Zhang

Assistant Professors: Bruck, Buckley, Chen, DeVoe, Gupta, S., Herrmann, Jackson, Kiger, Kim, McCluskey, Mead, Natishan, Schmidt, Walsh

Senior Lecturer: Russell

Lecturers: Ainane, Coder, Etheridge, Graham, Haslach, Last, Pavlin

Emeriti: Allen, Armstrong, Berger, Buckley, Cunniff, Dieter, Jackson, Kirk, Marks, Sanford, Sayre, Shreeve, Talaat, Walston, Yang

The Major

The mechanical engineering major prepares the student for the challenges of today and the future. The curriculum is one of the most up-to-date and forward-looking programs in the country. Students become involved with real-world engineering projects early on in the program through extensive interaction with engineers from industry and this interaction is continued throughout the curriculum. The coursework is now fully integrated in order to provide a seamless experience in their undergraduate education. The student graduates with the skills and the knowledge base which are necessary for success in today's marketplace and with the education necessary to adapt and succeed in the future as technology continues to change.

The mechanical engineer of today faces a more extensive range of critical problems than ever before. It is essential that the graduate be skilled not only in the traditional fundamentals of mechanical engineering such as solid mechanics, fluid mechanics, thermodynamics, heat transfer, materials engineering, electronic instrumentation and measurements, controls and design, but also in new and emerging areas such as

128 Meteorology

mechatronics, smart structures, electronic packaging, communication, information systems, total quality management, reliability and electromechanical systems. Most of these topics require extensive use of modern computing hardware and software. New classrooms which are equipped with state-of-the art computers and software have been added and these facilities are used as an on-going part of many courses. The student is taught to make use of this capability and to make sound engineering judgments while analyzing the seemingly unmanageable amounts of data and information which are obtained. Attributes such as teamwork, ethics, social awareness, and leadership are emphasized in many courses.

Electives taken during the senior year prepare the graduate to choose any of a number of career paths or to select a broad-based group of electives. All students work on projects throughout their program,, many of which teach the advantages of teamwork and the skills required for a team to succeed. Individual projects provide the opportunity for sometimes far-out creative thinking. In all cases, the students work closely with individual faculty members who serve as teachers, advisors, and mentors. Many undergraduate students have the opportunity to serve as Research Fellows and/or Teaching Fellows in the department.

Requirements for Major

	Semester	
	Credit Hours	
	I	II
Freshman Year		
MATH 140—Calculus I.....	4	
MATH 141—Calculus II.....		4
CHEM 133—General Chemistry.....	4	
PHYS 161—General Physics.....		3
ENGL101—Introduction to Writing.....	3	
ENES 100—Introduction to Engineering Design.....	3	
ENES 102—Statics.....		2
CORE Requirements.....		6
Total Credits.....	14	15
Sophomore Year		
MATH 241—Calculus III.....	4	
MATH 246—Differential Equations.....		3
PHYS 262, 263—General Physics.....	4	4
ENES 220—Mechanics of Materials.....	3	
ENES 221—Dynamics.....	3	
ENME 232—Thermodynamics.....		3
ENME 252—Electronics and Instrumentation I.....		3
ENME 271—Computational Methods in Mechanical Engineering		
CORE Requirements.....	3	3
Total Credits.....	17	16
Junior Year		
ENME 331—Fluid Mechanics.....	3	
ENME 332—Transfer Processes.....		3

to supplement course work in meteorology. With proper counseling from the Department of Meteorology adviser, the student wishing to graduate with an M.S. degree in meteorology may achieve that goal in five-and-one-half years from the inception of university studies.

Course Code: METO

MICROBIOLOGY

Departments in the College of Life Sciences have been reorganized. Courses in microbiology are now offered by the Department of Cell Biology and Molecular Genetics.

SCHOOL OF MUSIC (MUSC)

College of Arts and Humanities

Tawes Fine Arts Building, (301) 405-5549

Director: Kendall

Associate Directors: Cooper, Gibson

Professors: Cohen, Cossa, DeLio, Elsing, Fischbach, Folstrom, Guarneri String Quartet (Dalley, Soyer, Steinhardt, Tree), Heifetz, Koscielny, Mabbs, Major, McCoy, Montgomery, Mossi, Pacholczyk, Page, Robertson, Rodriguez, Traver

Associate Professors: Balthrop, Barnett, Davis, Dedova, Elliston, Gekker, Gibson, Gowen, Hill, Loup, McCarthy, Salness, Schuyler, Sparks, Vadala, Wakefield, Wexler, Wilson

Assistant Professors: Hanninen, King, Payerle, Woody

Instructor: Walters

Lecturers: Beicken, McConnell, Randall

†Distinguished Scholar-Teacher

The Major

Admission to all undergraduate music major degree programs (B.M., B.A., and B.S.) 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 in 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: the Bachelor of Music, with majors in theory, composition, and music performance; the Bachelor of Arts, with a major in music; the Bachelor of Science, with a major in music education, offered in conjunction with the College of Education.

Music courses and private lessons are open to all majors who have completed the specified prerequisites, or their equivalents. Lessons are also available for qualified non-majors, if teacher time and facilities permit. The University Bands, University Orchestra, University Chorale, University Chorus, Jazz Ensemble, and other ensembles are likewise open to qualified students by audition.

The Bachelor of Music Degree

Designed for qualified students with extensive pre-college training and potential for successful careers in professional music. A grade of C or above is required in all major courses.

College of Arts and Humanities requirements are waived for students majoring in B.M. Degree programs.

Sample Program—Bachelor of Music (Perf. Piano)

	Credits
Freshman Year	
MUSP 119/120—Applied Music.....	8
MUSC 128—Sight Reading for Pianists.....	4
MUSC 150/151—Theory of Music I/II.....	6

CORE Program.....	12
Total	30

Sophomore Year

MUSP 217/218—Applied Music.....	8
MUSC 228—Accompanying for Pianists.....	4
MUSC 230—History of Music I.....	3
MUSC 250/251—Advanced Theory of Music I/II.....	8
CORE Program.....	9
Total	32

Junior Year

MUSP 315/316—Applied Music.....	8
MUSC 330/331—History of Music II/III.....	6
MUSC 328—Chamber Music Performance for Pianists.....	4
MUSC 450—Musical Form.....	3
CORE Program.....	10
Total	31

Senior Year

MUSP 419/420—Applied Music.....	8
MUSC 492—Keyboard Music I.....	3
Musc 467—Piano Pedagogy I.....	3
Elective.....	4
CORE Program.....	9
Total	27

The Bachelor of Arts Degree

Designed for qualified students whose interests include a broader liberal arts experience. A grade of C or above is required in all major courses. Requirements for the Music-Bachelor of Arts Degree major include a minimum of 45 upper-level credits completed and the foreign language requirement of the College of Arts and Humanities.

Sample Program—Bachelor of Arts (Music)

	Credit Hours
Freshman Year	
MUSP 109/110—Applied Music.....	4
MUSC 150/151—Theory of Music I/II.....	6
MUSC 129—Ensemble.....	2
Electives, College and CORE Requirements.....	18
Total	30

Sophomore Year

MUSP 207/208—Applied Music.....	4
MUSC 250/251—Advanced Theory of Music I/II.....	8
MUSC 229—Ensemble.....	2
Electives, College and CORE Requirements.....	16
Total	30

Junior Year

MUSP 305.....	2
MUSC 330/331—History of Music II/III.....	6
MUSC 450—Musical Form.....	3
MUSC 329—Ensemble.....	1
Electives, College and CORE Requirements.....	18
Total	30

Senior Year

Music Electives.....	10
Electives, College and CORE Requirements.....	20
Total	30

The Bachelor of Science Degree (Music Education)

The School of Music in conjunction with the College of Education offers the Bachelor of Science degree with concentrations available in Instrumental Music Education and Choral-General Music Education for qualified students preparing for careers in K-12 teaching. For sample program requirements, see Department of Curriculum and Instruction, Music Education.

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: MUSC, MUED, MUSP

130 Natural Resources Management Program

NATURAL RESOURCE SCIENCES AND LANDSCAPE ARCHITECTURE (NRSL)

For Information, consult listings elsewhere in this chapter under Agronomy and Horticulture and Landscape Architecture.

NATURAL RESOURCES MANAGEMENT PROGRAM (NRMT)

College of Agriculture and Natural Resources

1457 Animal Sciences/Biological Resource Eng. Bldg., (301) 405-1198
<http://www.agnr.umd.edu/users/Bioreng/ugnrmt.htm>
E-mail: bg4@umail.umd.edu

Associate Professor and Coordinator: Kangas
Assistant Professor: Baldwin
Instructor: Adams

The Major

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. Employment opportunities for students graduating from the program exist in the fields of forestry and urban forestry, wetland science, environmental consulting, wildlife management, park management, and environmental enforcement, regulation, and policy development.

Students will pursue a broad academic program and elect subjects concentrated in one of three areas of interest: Plant and Wildlife Resources Management, Land and Water Resources Management, of Environmental Education and Park Management.

(Students interested in landscape management, turf and golf course management, plant science, horticulture and crop production, or conservation of soil, water, and environment should consider the Natural Resource Sciences major listed immediately before the Natural Resources Management Program)

Requirement for the Major

	Semester Credit Hours
CORE Program Requirements*	40
BIOL 105—Principles of Biology I	4
BIOL 106—Principles of Biology II	4
CHEM 103, 113—General Chemistry I, General Chemistry II*	8
One of the following:	
GEOL 100, 110?Physical Geology and Physical Geography Laboratory* OR	4
GEOG 201, 211?Geography of Environmental Systems and Geography of Environmental Systems Laboratory*	4
AGRO202—Fundamentals of Soil Science*	4
AREC 240—Introduction to Economics and the Environment*	3
AREC 332—Introduction to Natural Resource Policy	3
CMSC 103—Introduction to Computing	3
One of the following:	
MATH 140—Calculus I* OR	4
MATH 220—Elementary Calculus I*	3
BIOM 301—Introduction to Biometrics	3
PBIO 440, 441—Plant Ecology and Plant Ecology Laboratory	5
One of the following:	
GEOG 340—Geomorphology OR	3
GEOL 340—Geomorphology	4
MICB 200—General Microbiology*	4
One of the following:	
PHYS 117—Introduction to Physics* OR	4
PHYS 121—Fundamentals of Physics I*	4
One of the following:	
GVPT 273—Introduction to Environmental Politics OR	3
GVPT 306—Global Ecopolitics	3
NRMT 470—Principles of Natural Resources Management	4

*May satisfy college requirements and/or a CORE requirement.

Option Areas (23 hours)

Plant and Wildlife Resource Management

Science Area	10
Management Area	10
Related Course Work or Internship	3

Land and Water Resource Management

Science Area	10
Management Area	10
Related Course Work or Internship	3

Environmental Education and Park Management

Science Area	10
Management and Education Area	10
Related Course Work or Internship	3

Advising

Advising is mandatory. See the Coordinator, 1457 Animal Sciences/Biological Resources Engineering Building, (301) 405-1198.

Student Organization

Students may join the campus branch of the Natural Resources Management Society. Further information is available from the Natural Resources Management Society in 1457 Animal Sciences/Biological Resources Engineering Building.

Course Code: NRMT

NUTRITION AND FOOD SCIENCE (NFSC)

College of Agriculture and Natural Resources

3304 Marie Mount Hall, (301) 405-4521
<http://www.agnr.umd.edu/users/nfsc>

Chair: Under recruitment
Professors: Bean, Castonguay, Moser-Veillon†, Sims
Associate Professors: Jackson, Kantor
Assistant Professors: Blake, Boyle-Roden, Meng, Tuttle
Lecturer: Curtis
Adjunct Professor: DeLuca, Hansen
Adjunct Associate Professor: McKenna
Research Professor: Lineback
Emeriti: Ahrens, Prather, 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 American Dietetic Association, 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 accredited 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—Therapeutic Human Nutrition	4
NFSC 470—Community Nutrition	3
NFSC 491—Issues and Problems in Dietetics OR CORE Advanced Studies	3
Subtotal	35

b. Supporting Courses

MATH 113—Elementary Algebra OR MATH 115—Precalculus	3
CHEM 103—General Chemistry I	4
CHEM 113—General Chemistry II	4
CHEM 233—Organic Chemistry I	4
CHEM 243—Organic Chemistry II	4
BIOL 105—Principles of Biology I	4
ZOOL 211—Cell Biology and Physiology	4
ZOOL 422—Vertebrate Physiology	4
MICB 200—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	3
BMGT 360—Human Resource Management	3
BMGT 364 Management and Organization Theory	3
Additional CORE program courses	18
Restricted Electives	2
Electives	3
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—Principles of Food Processing	4
NFSC 421—Food Chemistry	3
NFSC 422—Food Product Research and Development (CORE capstone)	3
NFSC 423—Food Chemistry Laboratory	2
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	34

b. Supporting Courses

CMSC 102—Introduction to Information Technology OR CMSC 103—Introduction to Computing	3
MATH 113—Elementary Algebra OR MATH 115—Precalculus	3
MATH 220—Elementary Calculus I	3
MATH 221—Elementary Calculus II	3
CHEM 103—General Chemistry I	4
CHEM 113—General Chemistry II	4
CHEM 233—Organic Chemistry I	4
CHEM 243—Organic Chemistry II	4
BCHM 461—Biochemistry I	3
BIOL 105—Principles of Biology I	4
ENBE 414—Mechanics of Food Processing	4
MICB 200—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	3
Subtotal	86
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 103—General Chemistry I	4
CHEM 113—General Chemistry II	4
CHEM 233—Organic Chemistry I	4
CHEM 243—Organic Chemistry II	4
ZOOL 211—Cell Biology and Physiology	4
ZOOL 422—Vertebrate 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
MICB 200—General Microbiology	4
BIOM 301—Introduction to Biometrics	3
ENGL 101—Introduction to Writing	3
ENGL 393—Technical Writing	3
BIOL 105—Principles of Biology I	4
BIOL 222—Genetics	4
Additional CORE program requirements	24
Restricted electives	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 adviser. Information on advising may be obtained by calling the department office, (301) 405-4521.

Student Organizations

The NFSC Department has an active undergraduate Food and Nutrition (FAN) club which sponsors outreach activities and speakers on career-related topics, and participates in a variety of social activities. Call (301) 405-4521 for more information.

Course Codes: NFSC

PHILOSOPHY (PHIL)

College of Arts and Humanities

1124 Skinner Building, (301) 405-5689/90

Professor and Chair: Slote

Professors: Bub, Cherniak, Darden, Devitt, Greenspan, Leshner, Levinson, Martin, Pasch (emeritus), Rey, Schlaretzki (emeritus), Suppe, Svenonius, Wallace (part-time)

Associate Professors: Brown, Celarier, Horthy, Lichtenberg, Odell, Pietroski, Stairs

Assistant Professors: Kerstein, Morreau, Washington

Affiliate Professors: Brush, Hornstein

132 Physical Sciences Education

Adjunct Professors: Crocker, Fullinwider, Galston, Luban, Sagoff
Adjunct Associate Professor: Wachbroit
Adjunct Assistant Professors: Levine, Li, Wasserman

The Major

The study of philosophy develops students' logical and expository skills and increases their understanding of the foundations of human knowledge and value. The department views philosophy as an activity rather than a body of doctrine and students can expect to receive intensive training in clear thinking, inventive synthesis, and precise expression. For some, this will serve as preparation for graduate studies in philosophy. However, philosophical skills are useful in professions such as law, medicine, government, business management, and in any field that demands intellectual rigor. The department offers a wide range of courses, including several that deal with the philosophy of various disciplines outside philosophy itself.

Requirements for Major

For students matriculating after June 1, 1991:

- (1) a total of at least 36 hours in philosophy; not including PHIL 386
- (2) PHIL 310, 320, 326, either 271 or 273, either 250 or 360 or 380 or 462 or 464, either 341 or 346, and at least two courses numbered 400 or above;
- (3) a grade of C or higher in each course counted toward the fulfillment of the major requirement.

Fifteen hours of supporting courses are required to be selected in accordance with guidelines available in the Philosophy Department Lounge, Skinner Building, room 1119.

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

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

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) 405-5949
http://www.inform.umd.edu/EdRes/Colleges/CMPS/Depts/Physics/Physical_Science/

Chair: Einstein
Astronomy: Deming
Chemistry: Berkowitz
Computer Science: Kaye
Geology: Holtz
Engineering: Salamanca-Riba
Mathematics: Wolfe
Meteorology: Hudson
Physics: Einstein

Purpose

This program is designed to meet the needs of a broad and diverse group: students whose interests cover a wide range of the physical sciences; students whose interests have not yet centered on any one science; students interested in a career in an interdisciplinary area within the physical sciences; students who seek a broader undergraduate program than is possible in one of the traditional physical sciences; students interested in meteorology; pre-professional students (pre-law [especially patent law], pre-medical); or students whose interest in business, technical writing, advertising, or sales require a broad technical background. This program can also be useful for those planning science-oriented or technical work in the urban field; some of the Urban Studies courses should be taken as electives. Students contemplating this program as a basis for

preparation for secondary-school science teaching should consult the Science Teaching Center staff of the College of Education for additional requirements for teacher certification.

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 adviser depends upon the interest of the student. 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 advisers are also required.

Curriculum

The basic courses include MATH 140, 141 and one other math course for which MATH 141 is a prerequisite (11 or 12 credits): CHEM 103 and 113 (8 credits); PHYS 161, 262 and 263 (11 credits) or PHYS 171, 174, 272, 273, 275, 276 (14 credits); CMSC 104 (4 credits) or CMSC 105 (3 credits) or CMSC 106 (4 credits) or ENES 240 (3 credits) or CMSC 114 and CMSC 214 (8 credits).

Students desiring a strong background in physics should take the 171-276 sequence, which is required of physics majors, leads directly into advanced physics courses, and offers much smaller classes than the 161-263 sequence. Students who select Computer Science as an area of concentration should consider taking the CMSC 114 and 214 sequence. (CMSC 150 is a prerequisite for CMSC 214.)

Beyond the basic courses, students complete 24 upper-level (300-400) distributive credits. The distributive credits must be divided among three areas of concentration with at least six 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 Associate Dean in the School of Engineering. A grade of "C" or better must be earned in all program courses (basic prerequisite and distributive requirement courses).

All Physical Sciences students must have a planned program of study, including specific core and distributive courses, approved by the Physical Sciences Committee. These plans should be submitted as early as possible, generally in the sophomore year and normally no later than the beginning of the junior year. The committee shall NOT approve a program which, at the time the program is submitted, has fewer than 18 credits in the three distributive areas of the Physical Sciences program to be completed. Any changes to the plan must be approved in writing by the student's adviser and the chairperson. Engineering courses used for one of the options must all be from the same department, e.g., all must be ENGR courses or a student may use a combination of courses in ENNU, ENCH and ENMA, which are all offered by Department of Chemical 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. An Environmental Science option is also available; it is described on the Web site.

Certain courses offered in the fields included in the program are not suitable for Physical Sciences 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. Students should consult a Physical Sciences adviser for a current listing of "excluded" courses. Students must obtain written approval to use any of the special topics courses as part of their Physical Sciences requirement.

Honors

The Physical Sciences Honors Program offers students the opportunity for research and independent study, and will lead to a B.S. degree with Honors or High Honors. The requirements are: a) overall grade point average of 3.0 or better; b) grade point average of 3.2 or better in Physical Sciences courses; c) at least three credits (which may be distributed over two semesters) of independent study courses in the Physical Sciences Program; d) an honors thesis summarizing independent research; e) an oral

examination concerning thesis and related subjects. The thesis adviser 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 or the Colleges of Agriculture and Natural Resources and of Life Sciences. CMPS students have no further requirements to fulfill beyond those stated here plus the general education requirements. Agricultural and Life Sciences students must also satisfy the College requirements of their respective Colleges: these entail one additional course selected from one of the biological sciences, e.g., a four-credit course offered by the Departments of Botany (not BOTN 100), Entomology, Microbiology (not MICB 100) or ZOO 101, but not BIOL.

PHYSICS (PHYS)

College of Computer, Mathematical, and Physical Sciences

1120 Physics Building, (301) 405-5979

<http://www.physics.umd.edu>

Professor and Chair: Wallace

Professors and Associate Chairs: Chant, Ellis, Misner

Professors Emeriti: C. Y. Chang, Currie, DeSilva, Falk, Ferrell, Glover, Gluckstern, Griem, Holmgren, Kacser (Associate Professor Emeritus), Layman, MacDonald, Richard, Snow†, Sucher†, Weber, Woo, Zorn

Chancellor Emeritus: Toll

President Emeritus: Gluckstern

Distinguished University Professors: DasSarma, Fisher, Gloeckler, Ott, Sagdeev, Webb

University System of Maryland Regents Professor: Fisher

Professors: Alley, Anderson, Antonsen, Banerjee, Bhagat, Boyd, Brill, C. C. Chang, Chant, Chen, Cohen, Dorfman†, Dragt†, Drake, Drew, Einstein, Fivel, Gates, Glick, Goldenbaum, Goodman, Greenberg, Greene, Griffin, Hadley, Hamilton, Hassam, Hu, Jacobson, Jawahery, Kim, Kirkpatrick, Korenman, Langenberg, Liu, Lobb, Mason, Misner, Mohapatra, Paik, Papadopoulos, Park, Pati†, Prange, Redish, Roos, Skuja, Venkatesan, Wallace, Williams††

Professor (part-time): Z. Slawsky

Adjunct Professors: Boldt, Lynn, Mather, Phillips, Ramaty

Associate Professors: Anlage, Baden, Beise, Ellis, Ji, Hammer, Kelly, Ramesh, Wellstood

Assistant Professors: Eno, Lathrop, Luty, Roberts, Sullivan, Yakovenko

Lecturers: Nossal, Rapport, Restorff, M. Slawsky, Solow, Stern

† Distinguished Scholar-Teacher

†† Distinguished Faculty Research Fellow

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.

The Major

Courses required for Physics Major:

Note: Changes in major requirements are under review. Students should check with a department advisor for updated information.

Lower-level Courses	Credit Hours
PHYS 171—Introductory Physics: Mechanics and Relativity	3
PHYS 272—Introductory Physics: Fields	3
PHYS 273—Introductory Physics: Waves	3
PHYS 174—Physics Laboratory Introduction	1
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—Introduction to Linear Algebra	4

Upper-level Courses

PHYS 374—Intermediate Theoretical Methods

PHYS 401—Quantum Physics I

PHYS 402—Quantum Physics II	4
PHYS 404—Introduction to Statistical Mechanics	3
PHYS 410—Classical Mechanics	4
PHYS 411—Intermediate Electricity and Magnetism	4
PHYS 375—Experimental Physics III: Electromagnetic Waves, Optics, and Modern Physics	3
PHYS 405—Advanced Experiments	3

A grade of C or better is required in all Mathematics and Physics courses required for the major.

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

PLANT BIOLOGY

Departments in the College of Life Sciences have been reorganized. Courses in plant biology are now offered by the Department of Cell Biology and Molecular Genetics.

PRODUCTION MANAGEMENT

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

PSYCHOLOGY (PSYC)

College of Behavioral and Social Sciences

1107 Zoology-Psychology Building, (301) 405-5866

Professor and Chair: Hall

Associate Professor and Associate Chair: Plude

Professors: Anderson (Emerita), Brauth, Carter-Porges, Dooling, Fein*, Fox*, Gelso, Goldstein, Gollub (Emeritus), Helms, Hill, Hodost, Horton, Kruglanski, Lissitz*, Locke*, Magoon (Emeritus), Martin, McIntire (Emeritus), J. Mills, Nelson, Penner, Porges*, Rosenfeld*, Schneider, Scholnick, Sigall, Smith, Steinman, Sternheim, Suomi**, Torney-Purta*, Trickett, Tyler (Emeritus), Waldrop (Emeritus), Yeni-Komshian*

Associate Professors: Alexander, Aspinwall, R. Brown, Cassidy, Coursey, Freeman*, Hanges, K. Klein, Larkin, Leone*, Moss, Murnane, Norman, O'Grady, Schneiderman*, Stangor, Steele, Yager

Assistant Professors: J. Carter**, Castles**, Gelfand, L. Goodman, Marx**, Miller**, Moss, Pompilo**, Reibsame*, Sprei**, Thompson**, Wine**, Zamostny*

*affiliate

**adjunct

† Distinguished Scholar-Teacher

The Major

Psychology can be classified as a biological science (Bachelor of Science degree) and a social science (Bachelor of Arts degree) and the department offers academic programs related to both of these fields. The undergraduate curriculum in psychology is an introduction to the methods by which the behavior of humans and other organisms is studied, and to the biological conditions and social factors that influence such behavior. In addition, the undergraduate program is arranged to provide opportunities for learning that will equip qualified students to pursue further study of psychology and related fields in graduate and professional schools. Students who are interested in the biological aspects of behavior tend to choose a program leading to the Bachelor of Science degree, while those interested primarily in the impact of social factors on behavior tend to choose the Bachelor of Arts degree. The choice of program is made in consultation with an academic adviser.

134 Romance Languages Program

Requirements for Major

Graduation requirements are the same for the Bachelor of Science and Bachelor of Arts degrees. Students must take at least 35 credits in Psychology including 14 credits at the 400-level. PSYC 386, 387, 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, 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, 400, 401, 402, 403, 404, 405, 410, 415;
Area II: 221, 341, 420, 421, 423, 424, 440, 442, 443, 444;
Area III: 235, 330, 332, 334, 337, 353, 354, 355, 356, 357, 432, 433, 435, 436, 455, 456, 457, 458;
Area IV: 336, 361, 450, 451, 452, 460, 462, 463, 464, 465, 466

In addition, all students must complete (a) either MATH 111, or MATH 140 or MATH 220; (b) one of the following laboratory courses: BIOL 105*, CHEM 103, 104, 105, 113, 115, KNES 360, PHYS 121, 141, 142, 171, 262, 263, ZOOL 201, 202, 210; and (c) ENGL 101 or an English literature course from a prescribed department list.

*Note BIOL 101/102 does not satisfy the Lab Science requirement for Psychology. BIOL 101/102 is considered a duplication of credit with BIOL 105.

Students pursuing a Bachelor of Science degree must complete a 15-credit supporting course sequence in relevant math and/or science courses including two laboratory courses and nine credits at the advanced level. The 15 credits must be completed with at least a 2.0 average. Students should consult the current Psychology Undergraduate Program Guide for a list of approved advanced Math-Science Courses.

A grade of C or better must be earned in all 35 credits of psychology courses used for the major and all credits used to meet the Math-English-Science supporting course sequence. No course may be used as a prerequisite unless a grade of C is earned in that course prior to its use as a prerequisite. The prerequisite for any required laboratory course is completion of PSYC 200 and completion of the Math-English-Science supporting course sequence. Also, a 2.5 GPA in PSYC 100 and 200 is required for graduation. The departmental grade point average will be a computation of grades earned in all psychology courses taken (except 386, 387, 478, and 479) and the courses selected to meet the Math-English-Science sequence. The GPA in the major must be at least 2.0.

Admission to the Department of Psychology

All students (entering freshmen, new transfer students, and on-campus students) will be admitted into the major after they have met with an academic adviser and have signed the department's Contract for Incoming Psychology Majors. All majors are subject to an academic performance review no later than the semester in which they have earned 60 credits or completed 30 credits after transferring into the major, whichever is later. Students who do not meet the standards as set forth in the Contract for Incoming Psychology Majors will be required to select another major.

Advising

All students can be advised on choice of major, career decisions, research opportunities, graduate school applications, USP/CORE requirements, major requirements, scheduling, and other academic concerns. Advising appointments must be made in person in the undergraduate office, 1107 Zoology-Psychology Building. A program guide is available. Call the undergraduate office, (301) 405-5866, or contact Dr. Charles Sternheim, Director of Undergraduate Studies, (301) 405-5241, sternheim@bss3.umd.edu, for more information.

Student Organizations

Information about the Psychology Honorary Society (Psi Chi) and the Black Psychology Society is posted outside the Undergraduate Psychology Office, 1107 Zoology-Psychology Building. All students are welcome to attend the workshops sponsored by these organizations on topics of special interest to undergraduates.

Fieldwork

The department offers a program of fieldwork coordinated with a seminar through PSYC 386. Dr. Robert Coursey, (301) 405-5904, usually administers the course.

Honors

The Psychology Honors Program offers the exceptional student a series of seminars and the opportunity to do independent research under a faculty mentor. To be admitted to the program students must file a formal application and be interviewed by the Director of the Program, Dr. William S. Hall, 1147A Zoology-Psychology Building, (301) 405-5788. Students are eligible to enter the program if they are in their fourth to sixth semester of undergraduate work and have completed three courses in Psychology including PSYC 200, and have a 3.3 GPA overall and in Psychology. Students in the University Honors Program may be admitted in their third semester providing that they have (a) earned an A in PSYC 100 or 100H, (b) finished the mathematics prerequisite for PSYC 200 and (c) have an overall GPA and Psychology GPA of at least 3.3. Since there are different graduation requirements including an undergraduate thesis and supporting math and science courses, the student is urged to consult the Guide to the Honors Program in Psychology available in the undergraduate office.

Course Code: PSYC

ROMANCE LANGUAGES PROGRAM

College of Arts and Humanities

3106 Jimenez Hall, (301) 405-4024

Advisory Committee: Falvo (Italian), Little (Spanish), MacBain (French)

The Romance Languages Program is intended for students who wish to major in more than one Romance language. **Note: Program requirements are under review. Please consult an adviser for correct information.**

The Major

Students selecting this major must take a total of 45 credits selected from courses in two of the three components listed below: French, Italian and Spanish. The first four courses listed under each group are required for that particular language component; exceptions or substitutions may be made only with the approval of the student's adviser in consultation with the Romance Languages Advisory Committee. To achieve the total of 45 credits, 21 credits are taken in each of the two languages, as specified, and three additional credits are taken at the 400-level in either of the languages chosen. Literature or civilization courses may not be taken in translation.

There are no requirements for support courses for the Romance Languages major.

No grade lower than C may be used toward the major. Students who wish to apply for Teacher's Certification should consult the College of Education.

Requirements for Each Language

French—204, 301, 351, 352; one additional language course at the 300- or 400-level; two additional literature or civilization courses at the 400-level. **Italian**—204, 211, 301, 350; three additional literature or civilization courses at the 400-level. **Spanish**—207, 301, 321-322 or 323-324; one additional language course at the 300- or 400-level; two additional literature or civilization courses at the 400-level.

RUSSIAN AREA STUDIES PROGRAM

College of Arts and Humanities

2115 Francis Scott Key Hall, (301) 405-4307

Director: George Hajeska

Professors: Brecht (Asian and East European), Dawisha (Government and Politics), Lampe (History), Murrell (Economics), Robinson (Sociology)

Associate Professors: Hitchcock, Lelic and Martin (Asian and East European), Kaminski and Tismaneanu (Government and Politics), David-Fox,

Majeska (History)

Assistant Professors: Gor (Asian and East European), Sharp (Art History and Archaeology)

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

The Major

The Russian Area Studies Program offers courses leading to a Bachelor of Arts in Russian Studies. Students in the program study Russian, Soviet and East European culture as broadly as possible, striving to comprehend it in all its aspects rather than focusing their attention on a single element of human behavior. It is hoped that insights into the Russian ways of life will be valuable not only as such but as a means to deepen the students' awareness of their own society and of themselves.

Course offerings are in several departments: Germanic Studies, Asian and East European Languages and Cultures, Government and Politics, History, Economics, Geography, Philosophy, and Sociology. Students may plan their curriculum so as to emphasize any one of these disciplines, thus preparing for graduate work either in the Russian area or in the discipline.

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

Students must complete 24 hours in Russian language and literature courses selected from among the following equivalent courses: RUSS 101, 102, 201, 202, 301, 302, 303, 321, 322, 401, 402, 403, and 404. In addition, students must complete 24 hours in Russian area courses at the 300-level or above. These 24 hours must be taken in at least five different departments, if appropriate courses are available, and may include language-literature courses beyond the required 24 hours.

It is recommended but not required that the student who plans on doing graduate work complete at least 18 hours at the 300-level or above (which may include courses applicable to the Russian Area program) in one of the above-mentioned departments. It is also recommended that students who plan on doing graduate work in the social sciences, government and politics, economics, geography, and sociology take at least two courses in statistical methods.

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

In addition to the courses in Russian language, literature, and culture taught in the Department of Asian and East European Languages and Cultures, the following Russian Area courses are offered. Students should check the Schedule of Classes each semester.

ARTH 489—Modernism in Central and Eastern Europe
 ECON 315—Economic Development of Underdeveloped Areas
 ECON 380—Comparative Economic Systems
 ECON 482—Economics of the Soviet Union
 GEOG 325—Soviet Union
 GVPT 445—Russian Political Thought
 GVPT 451—Foreign Policy of the U.S.S.R.
 GVPT 481—Government and Administration of the Soviet Union
 HIST 305—The Eastern Orthodox Church: Its Cultural History
 HIST 340—Eastern Europe Under Communism
 HIST 344—The Russian Revolutions of 1917
 HIST 424—History of Russia to 1801
 HIST 425—History of Russia from 1801—1917
 HIST 442—The Soviet Union
 HIST 443—Modern Balkan History
 HIST 487—Soviet Foreign Relations
 PHIL 328B—Studies in the History of Philosophy: Marxist Philosophy
 SOCY 474—Soviet Ethnic Issues

The various cooperating departments also offer occasional special courses in the Russian and Soviet field. HIST 237, Russian Civilization, is recommended as a general introduction to the program but does not count toward the fulfillment of the program's requirements.

Russian Language and Literature

For information, see listing under Department of Asian and East European Languages and Cultures.

SOCIOLOGY (SOCY)

College of Behavioral and Social Sciences

2108 Art-Sociology Building, (301) 405-6389

Professor and Chair: Hamilton

Professors: Bianchi, Billingsley* (Family and Community Development), Brown, Dager (emeritus), Falk, Finsterbusch, Hage[†], Henkel (emeritus), Kammeyer, Lejins (emeritus), Meeker, H. Presser, S. Presser, Ritzer[†], Robinson, D. Segal[†], M. Segal[†], Vanneman

Associate Professors: Desai, Favero* (AES), J. Hunt, L. Hunt, Kahn, Korzeniewicz, Landry, Lengermann, Neustadt, Pease

Assistant Professors: Dance, DeRose, Kestnbaum, Milkie

Lecturer: Moghadam

[†]Distinguished Scholar-Teacher

*Joint appointment with unit indicated.

The Major

Sociology is the scientific study of societies, institutions, organizations, groups, and individuals. Sociological studies range from the social factors that affect individuals, to group processes, and societal change. The strengths of the department are the study of population (demography), military sociology, political economy, social psychology, and the connections among gender, work, and family.

A major in sociology offers (1) a general education especially directed toward understanding the complexities of modern society and its social problems by using basic concepts, research and statistical skills; (2) a broad preparation for various types of professions, occupations, and services dealing with people; and (3) preparation of qualified students for graduate training in sociology, social work, law, and business. Sociology also forms a valuable background for those interested in other fields or majors. Courses in sociology can be used as preparation for careers in government and private research, urban planning, personnel work, human resources management, and many other policy-making and administrative careers.

Areas of Specialization

Undergraduate specializations are available in research methods, social psychology, social demography, social institutions, and inequality. These specializations can often be integrated with a second major. Versatility and the rich experiential learning possibilities of the Washington metropolitan area combine to make the sociology curriculum valuable preparation for a career choice.

Requirements for Major

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

Students in sociology must complete 50 hours of departmental requirements, none of which may be taken pass/fail. Thirty-eight of these hours are in sociology course work, which must be completed with a minimum grade of C in each course; SOCY 100 should be taken in the freshman or sophomore year followed by SOCY 203. Three hours of mathematics (MATH 111 or its equivalent or higher) are required of majors as a prerequisite of SOCY 201. SOCY 202 follows SOCY 201. SOCY 441 (stratification) and one additional upper-level methods course should be taken by the second semester of the junior year.

The supporting course requirement for majors is 12 hours of a coherent series of courses from outside of the department that relate to the student's major substantive*** or research interests. These courses need not come from the same department, but at least six hours must be taken at the 400-level. It is strongly recommended that the student work out an appropriate supporting sequence for the particular specialization with the department adviser.

Department of Sociology Requirements

Semester Credit Hours

CORE/USP Program Requirements.....	40/43
SOCY 100—Introduction to Sociology	3
SOCY 201*—Introductory Statistics for Sociology.....	4
SOCY 202—Introduction to Research Methods in Sociology	4
SOCY 203—Sociological Theory	3
SOCY 441—Stratification and Inequality	3

136 Spanish and Portuguese Languages and Literature

1 additional methodology course**	3
2 Sociology courses at any level	6
4 Sociology courses at 400 level	12
4 supporting courses***	12
Internship (recommended, not required)****	6
USP/CORE Electives****	24-30/21-27
Total	120

*Three hours of mathematics (MATH 111 or its equivalent, or higher) are required as prerequisite.

**The second required methods course and all supporting courses must be selected from approved lists.

***Courses complementing Sociology specialization must be selected from an approved list and must include at least two courses at the 400—level.

****Students choosing to take internships will reduce their elective credit total by six credits.

Advising

Regular advising is strongly recommended for all majors. Further information on course work, internships, the departmental honors program, careers, and other topics may be obtained from the Sociology undergraduate adviser, 2108 Art/Sociology Building, (301) 405-6389.

Fieldwork and 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 SOCY 386 when an internship/volunteer position is combined with an academic project. A prerequisite of 12 credits in Sociology course work is required.

Honors

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 successfully complete the requirements for graduation with Honors. Further information on the honors program is available from the Sociology Undergraduate Office.

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 with the university, and strives to enhance the sense of community within the department. Representatives of the Collective participate on 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 G.P.A. (3.0) and overall G.P.A. (3.0). Students may apply after they have completed 18 credits of Sociology course work. This organization's activities focus on providing tutoring services for undergraduates in the core courses.

Survey Research Center

1103 Art-Sociology Building, (301) 314-7831

Director: Stanley Presser

The Survey Research Center was created in 1980 as a special purpose research facility within the behavioral and social sciences. The center specializes in the design of questionnaires and survey data collection for policy purposes, and has the capacity to conduct mini-surveys, survey experiments, and in-depth clinical interviews. The center supports undergraduate and graduate education by providing both technical training

and practical experience to students. The center also has a strong community service mission through the provision of technical assistance on survey methods and survey design to units of state and local governments, and by conducting surveys on a contract or grant basis for these governmental units.

Course Code: SOCY

SPANISH AND PORTUGUESE LANGUAGES AND LITERATURE (SPAN, PORT)

College of Arts and Humanities

2215 Jimenez Hall, (301) 405-6441

Professor and Chair: Sosnowski

Associate Chair: Lavine

Professor emerita: Nemes

Professors: Aguilar-Mora, Cypess, Harrison, Pacheco††

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

Assistant Professors: Bouvier, Rodriguez, Sánchez

Instructors: Little, Roman

†† Distinguished University Professor

The Majors

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

Undergraduate majors can benefit from a wide range of courses in Spanish and Latin American literature and civilization; technical courses in translation, linguistics, and commercial uses of Spanish. Area studies programs are also available in conjunction with other disciplines to provide the student with a solid knowledge of the Spanish and Latin American worlds.

A grade of at least C is required in all major and supporting area courses.

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

Language and Literature Major

Courses: SPAN 207, 221, 301-302, 311 or 312, 321-322 or 323-324, 325-326 or 346-347; plus four courses in literature at the 400-level; one course may be taken in Luzo-Brazilian literature, for a total of 39 credits. Nine credits of supporting courses, six of which must be at the 300- or 400-level in a single area other than Spanish, for a combined total of 48 credits. Suggested areas: art, comparative literature, government and politics, history, philosophy, and Portuguese.

Foreign Area Major

Courses: SPAN 207; 301-302; 311 or 312; 315 and 415 or 316 and 317; 321-322 or 323-324; 325-326 or 346-347, plus three courses in literature at the 400-level; one course may be taken in Luzo-Brazilian literature, for a total of 39 credits. Nine credits of supporting courses, six of which must be at the 300— or 400-level in a single area other than Spanish, for a combined total of 48 credits. Suggested areas: anthropology, economics, geography, government and politics, history, Portuguese, and sociology.

Translation Option

Courses: SPAN 207; 301-302, 311 or 312; 316 and 317; two courses from 318, 356, 357, 416, 417; 321-322 or 323-324; one course from 325, 326, 346, 347; plus two courses in literature at the 400-level; one course may be taken in Luzo-Brazilian literature, for a total of 39 credits. Nine credits of supporting courses, six of which must be at the 300— or 400-level in a single area other than Spanish, for a combined total of 48 credits. Suggested areas: art, comparative literature, government and politics, history, philosophy, and Portuguese.

Business Option*

Courses: SPAN 207; 211; 301-302; 311 or 312; 315 and 415; 316 and 317; 325-326 or 346-347; 422, for a total of 36 credits. Twelve credits of

supporting courses, six of which must be at the 300—or 400—level in a single area other than Spanish. Suggested areas: business and management, economics, government and politics, history and geography.

Students interested in majoring in a combination of two Romance languages should see the description of the Romance Languages Program, above.

*A double major program, Business, Language, and Cultures, combines International Business and Spanish.

Honors

The department Honors Program offers qualified students the possibility of working in close contact with a mentor on an original thesis. Honors seminars are primarily for students who have been accepted to the Program, but are open to others with the approval of the Honors Director. Honors students must take six credits of Honor Thesis. Interested students should see the Director of the Spanish Honors Program.

Lower-Division Courses

The elementary and intermediate courses in Spanish and Portuguese consist of three semesters of four credits each (101, 102, 201). The language requirement for the B.A. degree in the College of Arts and Humanities is satisfied by passing 201 or equivalent. Students who wish to enroll in Spanish 101, 102, and 201 must present their high school transcript for proper placement. See the Schedule of Classes for further information. Students may not receive credits for both Spanish 102 and Spanish 103.

Transfer students with college credit have the option of continuing at the next level of study.

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

Course Codes: SPAN, PORT

SPECIAL EDUCATION (EDSP)

College of Education

1308 Benjamin Building, (301) 405-6515/4
<http://www.inform.umd.edu/educ>

Professor and Chair: Burke

Professors: Beckman, Egel, Graham, Harris, Hebler (emeritus), Leone, Moon

Associate Professors: Cooper, Kahl, Lieber, Neubert, Speece

Assistant Professors: Maccini, Malmgren

Associate Director: McLaughlin

Research Associates: Florian, Greig, Gruber, Kelly, Li, Meisel, Page-Voth, Warren

Coordinator of Undergraduate Advising: Molloy

Lecturers: Aiello, Buchanan, Danehy, Fink, Hart, Henderson, Hudak, Long, Lyles, Simon, Thanouser, Troia, Waranch

Faculty Research Assistants: Barnwell, Bertsch, Frank, Lane, Newcomb, Samels, Stepanek, Walker

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 31 other states. Students considering a special education major enroll in courses which meet university and college requirements while they take supporting course work designed to provide an understanding of typical human development and basic psychological and sociological principles of human behavior. Special Education students receive specialized training in the following areas: language development; motor development; social-emotional development; typical human behavior; social and educational needs of individuals with disabilities; diagnostic and educational assessment procedures; instructional procedures and materials; curriculum development; classroom and behavior management; effective communication with the parents and families of children with disabilities;

community resource planning; and local, state, and federal laws concerning children and youth with disabilities. Graduates of the program are expected to master specific skills in each of these areas.

Requirements for Major

Students interested in majoring in Special Education must consult a departmental adviser 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 generic 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. During Semester V, students select one of the following four areas of specialization:

1. Severe Disabilities (SD)
2. Early Childhood Special Education (EC)
3. Educationally Handicapped (EH)
4. Secondary and Transition Special Education (ST)

Course work in each of these four areas is designed to develop expertise with a specific special education population. Students work directly with children or youth with disabilities during each semester, leading up to student teaching during the last semester. Specialty area programs include 6 to 9 hours of electives.

Combined Bachelor's/Master's Program

Selected undergraduate students majoring in special education will be eligible for dual application of credit to both the bachelor's and master's degrees. A student desiring graduate credit should apply for admission to the Graduate School during the last semester of the fourth year. If admitted to the Graduate School, the student may select up to 12 credits (four courses) of specified course work from the fifth year of the undergraduate program to be applied simultaneously toward the credits required for the master's degree in special education at the University of Maryland. The selected courses may not include field practica or student teaching experiences. Students will be expected to fulfill supplemental requirements in the selected courses. To complete the master's degree, students must fulfill all Graduate School requirements for the degree, with the exception of the selected 400-level courses.

Admission

Prior to formal acceptance as a special education major, all students are required to enroll in a special education introductory course (EDSP 210) which provides a survey of the history and current issues in special education. Upon successful completion of the introductory course and 45 semester hours of requirements, students apply for formal admission to the professional program of the Department of Special Education by submitting an application with a statement of intent specifying their professional goals. To be accepted as a full special education major, students must fulfill the College of Education requirements for admission to Teacher Education, as well as the following departmental conditions:

1. Completion of course work indicated below with an asterisk.
2. Admission is competitive beyond the minimum 2.5 grade point average required for consideration.
3. Submission of an application together with a statement of intent specifying the applicant's professional goals.
4. Submission of three letters of recommendation.

Admittance will be based on the completion of the required courses, the grade point average, the applicant's experience with persons with disabilities, and the appropriateness and clarity of the professional goal statement. An appeals process has been established for students who do not meet the competitive GPA for admission, but who are applying in connection with special university programs including affirmative action and academic promise.

Advising

The Department of Special Education provides academic advisement through a faculty and a peer advisement program. Special Education majors are assigned a faculty adviser, who is carefully matched to the student's area of interest. It is required that all students consult an adviser 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 adviser with regard to USP requirements.)

- *HIST 156 or HIST 157 (3)
- *STAT 100 (3)
- *Lab Science (4)
- *ENGL Literature (3)
- *PSYC 100 (3)
- *SOCY 100 or 105 (3)

Other Academic Support Courses

- *HESP 202 (3)
- MATH 210 (4)
- *EDHD 411 or PSYC 355 (3)

Professional Courses

- *EDSP 210—Introduction to Special Education (3)
- EDHD 300—Human Development and Learning (6)
- EDPA 301—Foundations of Education (3)
- EDSP 320—Introduction to Assessment in Special Education (3)
- EDSP 321—Comparative Approaches to Behavior and Classroom Management in Special Education (3)
- EDSP 322—Field Placement in Special Education I (3)
- EDSP 443—Assessment and Instructional Design for the Handicapped: Reading and Written Communication Disorders (3)
- EDSP 331—Introduction to Curriculum and Instructional Methods in Special Education (3)
- EDSP 333—Field Placement in Special Education II (3)
- EDCI 397—Principles and Methods of Teaching in Elementary Schools (3) OR
- EDCI 390—Principles and Methods of Secondary Education (3)

Specialty Area Requirements

The Severe Disabilities Option

EDSP 400—Assessment, Curriculum and Instructional Methods for

Professors: Gillespie, Meersman
 Associate Professors: Coustaut, Hébert, Huang, Patterson, Schuler, Wagner (Director of Undergraduate Studies)
 Assistant Professors: Cabot, Conway, Reese
 Instructors: Kriebs
 Emeritus: Pugliese

The department curricula lead to the Bachelor of Arts degree, and permit the student to develop an emphasis in theatre design or performance. In cooperation with the Department of Curriculum and Instruction and the Department of Speech, an opportunity for teacher certification in speech and drama is provided.

The curricula are designed to provide through the study of theatre history, design, performance, and production: 1) a liberal education through the study of theatre; 2) preparation for various opportunities in the performing arts.

The Major

Major Requirements are 42 hours of course work in theatre, exclusive of those courses taken to satisfy college and university requirements. Of the 42 hours, at least 21 must be upper-level (300-400 series). No course with a grade less than C may be used to satisfy major or supporting area requirements.

Requirements for Major

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

Required core courses for all majors are: THET 110, 111, 120, 170, 330, 475, 479, 490, 491.

Design Emphasis: THET 273, 375, 476, 481, plus additional courses in theatre to make the minimum.

Performance Emphasis: THET 221, 320, 420 or 430, 474 or approved Technical/Design course, plus additional courses in theatre to make the minimum.

Supporting courses for the Design and Performance Emphases include one from each of the following: ENGL 403, 404, or 405; ENGL 434 or 454; any DANC; any MUSC; any ARTH or ARTT course approved by the departmental adviser.

Advising

Advising is mandatory for undergraduate theatre majors. Students should report to the Theatre department office for registration materials before making an appointment with their adviser.

Financial Aid

Scholarships and financial assistance may be awarded to enrolled students through a number of Creative and Performing Arts Scholarships and Theatre Patrons Scholarships. Other scholarships and workshops are awarded yearly to continuing students. For further information, contact the Coordinator of the Scholarship Program.

The department presents a number of University Theatre productions each year. Students also comprise the Administering Council in Theater (ACT).

Course Code: THET

TRANSPORTATION, BUSINESS, AND PUBLIC POLICY

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

WOMEN'S STUDIES (WMST)

College of Arts and Humanities

2101 Woods Hall, (301) 405-6877
 E-mail: WS93@umail.umd.edu
<http://www.inform.umd.edu/EdRes/Colleges/ARHU/Depts/WomensStudies>

Chair and Professor: Moses
 Professors: Beck, Bolles, Dill, Rosenfelt
 Associate Professors: Barkely Brown, Kim, King
 Assistant Professor: Matthes
 Instructor: Allahyari
 Affiliate Faculty: Harley, Williams, Wilson (Afro-American Studies); Parks, Sies (American Studies); Gips (Art); Sharp, Withers (Art History); Palmer (Biology); Greer (Chemistry); Doherty, Hallett, Stehle (Classics); Collins, Fuegi, Lanser, Marchetti, Peterson (Comparative Literature); Fassinger (Counseling and Personnel Services); Heidelbach (Curriculum and Instruction); Kerkham (Asian and East European Languages and Culture); Coletti, Donawerth, Kauffman, Kornblatt, Leonardi, Lindemann, Logan, McDowell (English); Leslie (Family Studies); Hage, Mossman (French and Italian); Frederiksen, Oster, Strauch (Germanic Studies); Bedos-Rezak, Brush, Gullickson, Lyons, Muncy, Zilfi (History); Masnik (Hornbake Library); Beasley, Grunig (Journalism); Robertson (Music); Day, Luckert (McKeldin Library); Fullinwider, Li (Philosophy and Public Policy); Goodman, Helms, O'Brien, Scholnick (Psychology); Bianchi, Desai, Hunt, Moghadam, Presser, Segal (Sociology); Bouvier, Cypess (Spanish and Portuguese Languages and Literature); Coustaut, Gillespie, Schuler (Theatre); Weil (Center for Women in Int'l Security); Ryan (Writing Center)

The Major

The Women's Studies Department offers an interdisciplinary academic program designed to examine the historical contributions made by women, re-examine and reinterpret existing data about women, and introduce students to the methodology of feminist scholarship. The program offers interdisciplinary courses on women in other disciplines, and promotes the discovery of new knowledge about women. Women's Studies courses challenge students to question traditional knowledge about women and men and to examine differences among women. Students gain an understanding of and respect for differences in human lives as they encounter issues of diversity in the classroom: age, ability, class, ethnicity, race religion, and sexual preference.

Requirements for 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. Drawing from approximately 50 courses, many of which are crosslisted with other academic units, students will have the opportunity to design an emphasis within the major relevant to their special interests. Students will earn a total of 39-42 credit hours, distributed as indicated below. 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 adviser. Advising is mandatory.

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 and Culture	3
WMST 300—Feminist Reconceptualizations.....	3
WMST 350—Feminist Education Practicum and Analysis.....	3
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 (9 credit hours)

Area 1: Arts and Literature

WMST 241—Women Writers of French Expression in Translation	
(also FREN 241)	3
WMST 250—Introduction to Women's Studies:	

140 Campus-Wide Programs

Women, Art, and Culture	3
WMST 255—Introduction to Literature by Women (also ENGL 250)....	3
WMST 275—World Literature by Women (also CMLT 275)	3
WMST 281—Women in German Literature and Society (also GERM 281).....	3
ENGL 348—Literary Works by Women (also ENGL 348)	3
WMST 408—Special Topics in Literature by Women before 1800 (also ENGL 408).....	3
WMST 444—Feminist Critical Theory (also ENGL 444)	3
WMST 448—Special Topics in Literature by Women of Color* (also ENGL 448).....	3
WMST 458—Special Topics in Literature by Women after 1800 (also ENGL 458).....	3
WMST 466—Feminist Perspectives on Women in Art (also ARTH 466)3	
WMST 496—African-American Women Filmmakers* (also THET 496)	3
FREN 481—Femmes Fatales and the Representation of Violence in Literature	3
FREN 482—Gender and Ethnicity in Modern French Literature	3

Area II: Historical Perspectives

WMST 210—Women in America to 1880 (also HIST 210)	3
WMST 211—Women in America since 1880 (also HIST 211)	3
WMST 212—Women in Western Europe, 1750–present (also HIST 212).....	3
WMST 320—Women in Classical Antiquity (also CLAS 320)	3
WMST 492—History of the Sportswoman in American Institutions (also KNES 492)	3
AASP 498W—Black Women in United States History*	3
AMST 418—Cultural Themes in America: Women and Family in American Life	3
HIST 309—Proseminar in Historical Writing: Women’s History (Special Topic)	3
HIST 319Z—Special Topics in History: Women in the Middle East*	3
HIST 433—Changing Perceptions of Gender Identities in the U.S., 1880-1935	3
HIST 493—Victorian Women in England, France, and the United States.....	3
HIST 494—Women in Africa*	3
HIST 495—Women in Medieval Culture and Society.....	3

Area III: Social and Natural Sciences

WMST 200—Introduction to Women’s Studies: Women and Society ..	3
WMST 313—Women and Science (also ZOOL 313)	3
WMST 325—Sociology of Gender (also SOCY 325).....	3
WMST 326—Biology of Reproduction (also ZOOL 326).....	3
WMST 336—Psychology of Women (also PSYC 326)	3
WMST 360—Caribbean Women*	3
WMST 410—Women of the African Diaspora*	3
WMST 420—Asian-American Women: The Social Construction of Gender*	3
WMST 430—Gender Role Issues in the Family (also FMST 430).....	3
WMST 436—Legal Status of Women (also GVPT 436)	3
WMST 452—Women in the Media (also JOUR 452)	3
WMST 471—Women’s Health (also HLTH 471)	3
WMST 493—Jewish Women in International Perspective*	3
WMST 494—Lesbian Communities and Differences*	3
AASP 498—Special Topics in Black Culture: Women and Work*	3
CCJS 498—Special Topic in Criminology and Criminal Justice: Women and Crime	3
KNES 451—Sport and the American Woman.....	3
SOCY 425—Gender Roles and Social Institutions.....	3
SOCY 498—Special Topics in Sociology: Women in the Military.....	3
COMM 324—Communication and Gender	3

*Approved course for cultural diversity requirement.

3. Courses in Cultural Diversity

Students will select two courses for a minimum of six semester 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

Each student, with the help of a Women’s Studies adviser, will design an emphasis consisting of at least three courses or nine semester credit hours. Courses in this category may overlap with other requirements. Courses will ordinarily be drawn from those approved for the major. In some instances, students may secure permission from the Women’s Studies adviser 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.

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 to the program in their junior year. Students are required to take six credits of upper-level honors or honors-options courses and honors seminars (WMST 488H), as well as write and defend a thesis. Contact the Academic Adviser for further information.

Advising

Undergraduates in good academic standing may enroll in the Women’s Studies Program or obtain more information about available options and services by contacting the Undergraduate Academic Adviser, (301) 405-6827, or writing to Women’s Studies Department, 2101 Woods Hall, University of Maryland, College Park, MD 20742-7415.

Course Code: WMST

ZOOLOGY

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

CAMPUS-WIDE PROGRAMS

Air Force Aerospace Studies Program (ROTC)

2126 Cole Student Activities Bldg., (301) 314-3242

Director: Moses

Assistant Professors: Christ, Klose, Shick

Staff: Burton, Graves

The Air Force Reserve Officers Training Corps (ROTC) provides two programs for college men and women to earn a commission as a Second Lieutenant in the United States Air Force while completing their University degree requirements. To enter the AFROTC program, students should inform their adviser, and register for classes in the same manner as for other courses.

Four-Year Program

This program is composed of a General Military Course (GMC) and a Professional Officer Course (POC). The first two years (GMC), normally for freshmen and sophomores, give a general introduction to the Air Force and the various career fields. Students enrolled in the GMC program incur no obligation and may elect to discontinue the program at any time. The final two years (POC) concentrate on the development of leadership skills and the study of United States defense policy. Students must compete for acceptance into the POC. Students enrolled in the last two years of the program are eligible for an AFROTC scholarship.

Students in the four-year program who successfully complete the first two years of the program and are accepted into the POC program must attend four weeks of field training at a designated Air Force base during the summer after completing their sophomore year of college.

Two-Year Program

This program is normally offered to prospective juniors but may be taken by seniors and graduate students. The academic requirements for this program are identical to the final two years of the four-year program and students are eligible to receive the same benefits. During the summer preceding entry into the program, all candidates must attend six weeks of field training at a designated Air Force base. Students should start the application process as soon as possible—not later than the January prior to joining the cadet corps.

THE CURRICULUM

General Military Course (GMC)

Freshman year—ARSC 100 (Fall) and ARSC 101 (Spring). These courses introduce the student to the roles of the Department of Defense and the U.S. Air Force in the contemporary world. Each one-credit course consists of one hour of academic class and two hours of Leadership Laboratory each week.

Sophomore year—ARSC 200 (Fall) and ARSC 201 (Spring). ARSC 200 provides an historical review of air power employment in military and nonmilitary operations in support of national objectives and a look at the evolution of air power concepts and doctrine. ARSC 201 examines concepts of leadership, ethics, and quality. Each one-credit course consists of one hour of academic class and two hours of Leadership Laboratory each week.

Professional Officers Course (POC)

Junior year—ARSC 310 (Fall) and ARSC 311 (Spring). 3 credits per semester. Course introduces students to management and leadership theory and application. Leadership laboratory participation is required for AFROTC cadets.

Senior year—ARSC 320 (Fall) and ARSC 321 (Spring). 3 credits per semester. Course reviews history of American defense/foreign policy. Second semester concentrates on ethics, military justice, officership and related issues. Leadership laboratory participation is required for AFROTC cadets.

All Aerospace courses are open to any university student for credit whether or not he or she is in the AFROTC Program. Students who are not in the AFROTC Program do not attend the Leadership Laboratory.

General Requirements for Acceptance into the POC

The student must complete the General Military Course and the field training session, pass the Air Force Officer Qualifying Test, be physically qualified, be in good academic standing, meet age requirements and be a U.S. citizen. Successful completion of the Professional Officer Course and a bachelor's degree or higher are prerequisites for a commission as a Second Lieutenant in the United States Air Force. Additional information may be obtained by telephoning the Office of Aerospace Studies, (301) 314-3242.

Scholarships

AFROTC scholarship programs provide four-, three-, and two-semester scholarships to students on a competitive basis. Scholarships are available in many fields and are based on merit. Those selected receive tuition, lab expenses, incidental fees, and book allowance plus a non-taxable monthly allowance of \$150.

Any student accepted by the University of Maryland may apply for these scholarships. AFROTC membership is required to receive an AFROTC scholarship.

AFROTC Awards

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

Course Code: ARSC

STUDY ABROAD PROGRAMS

3125 Mitchell Bldg., (301) 314-7746
E-mail: studyabr@deans.umd.edu
<http://www.inform.umd.edu/INTL/studyabroad>

Coordinator: Rick Weaver

The goal of the Study Abroad Office is to enable students to incorporate a summer, winter, semester, or year abroad into their degree program at Maryland. Study abroad increases awareness of other cultures and languages while providing a comparative international perspective. Many

students find study abroad essential for their major or career plans. Others view it as part of their liberal arts education.

Advising and Information

The Study Abroad Office provides handouts and advising on the wide variety of programs available. A small library provides information on programs offered by other universities. The office assists students in obtaining credit for their experience abroad. All students can use study abroad to enrich their programs and to fulfill CORE requirements and electives.

Maryland Study Abroad Semester/Year Programs

Study in London: The curriculum consists of courses in the humanities, business, social sciences, and sciences. Students live in dorms, in flats with other program participants, or with a British family to increase their immersion in British life. Fall and spring semesters.

Study in Nice, France: Offers French language courses for foreigners and regular courses at the University of Nice for students with sufficient French language background. Year and spring semester.

Study in Mexico City: Offers Spanish language and Latin American studies courses. Fall and spring semesters.

Study in Alcalá, Spain: Offers Spanish language and culture studies at the University of Alcalá de Henares. Students may enroll in an internship or in a course in Spanish literature, business, or civilization. Spring semester.

Study in Tel Aviv, Israel: Offers a semester of study in Israel. Students attend Tel Aviv University where they take courses taught in English that focus on Israeli and Middle East studies. Fall and spring semesters.

Study in Rome, Italy: Students take courses in English at the American University of Rome. AUR offers instruction in the liberal arts, business, Italian language and culture, and international studies. Fall and spring semesters.

Study in Brazil: Offers a summer and fall semester at the Catholic University of Rio de Janeiro to take regular university courses offered in Portuguese.

Denmark's International Study Program: Maryland acts as a coordinator for DiS in Copenhagen, which offers courses in English focusing on humanities and social sciences, engineering, international business, marine biology, and environmental studies. Students are housed with families or in dorms. Fall and spring semesters.

German and Engineering: As part of the dual degree program, students spend six months in Germany studying the language and completing an internship with an engineering company. A two-month intensive technical German language study is followed by four months' paid internship in Germany. Spring semester.

Winterterm

New and exciting programs are offered every year. At the time of printing, Winterterm 2000 programs were being developed. In 1999, the following programs were offered:

Study in Belize: Mayan Culture, Tropical Rainforests, and Coral Reefs: Part one of this course explores present day archeological sites related to Mayan culture. In the second part, students study the tropical environment of Belize.

Study in Costa Rica: Sustainable Tropical Agro-Ecosystems: Students explore the ecosystems and economic and environmental resource interrelationships in the context of a global economy.

Study in Cuba: Nationalism, Socialism and Democracy: Participants explore the themes of nationalism, socialism and democracy in the context of Cuba. One week of study at UM is followed by two weeks in Havana, Cuba.

Study in Germany: Business, Politics and the European Union: The course focuses on the European Union and the central roles that European and German history, politics, culture and business have played in its emergence and evolution.

Study in Mexico: Social Change and Mobilization: In Mexico City, students are introduced to changing patterns of social inequality, the process of adopting democratic institutions and processes, and emerging social movements.

142 Undergraduate Studies

Study in Vietnam: The Five Faces of Vietnam: Participants explore the political, cultural, and economic life of contemporary Vietnam as well as the legacies of the American war in Vietnam.

Summer Programs

Architecture Abroad: The School of Architecture sponsors various summer study programs which allow students at an advanced undergraduate and graduate level to deal creatively with architectural issues in a foreign environment. Program locations vary, but include Tunisia, Turkey, and Western Europe.

Summer in Kassel, Germany: The Department of Germanic Studies sponsors a five-week intensive language and culture program in Kassel, Germany.

Summer in Taxco, Mexico: The Department of Spanish and Portuguese sponsors a six-week intensive Spanish language program for students at the elementary and intermediate levels.

Summer in Spain: The Department of Spanish and Portuguese sponsors a five-week intensive language and culture program in Spain.

Honors in Kiplin Hall, England: Offers a survey of British history, culture, and literature in London and Kiplin Hall for Honors students.

Exchanges

The Study Abroad Office administers reciprocal exchanges with specific universities overseas. These exchanges are often related to academic departments and require extensive language or academic background. All the exchanges require at least a 3.0 grade point average. Exchanges are available with the following British Universities: Kings College for Engineering and Physics majors; University of Kent for government and politics majors; Kingston University for chemistry majors; University of Sheffield for English majors and American studies majors; University of Lancaster for math majors; University of Bristol for philosophy majors; University of Surrey for sociology majors; and University of Liverpool for history majors. In Japan, Keio University for intensive Japanese language, and Hiroshima and Chiba universities for the humanities, social sciences, and sciences and engineering. In Korea, Yonsei University. In Germany, the University of Tübingen and the Gesamthochschule Kassel. In Austria, the University of Vienna. In Spain, University of Alcalá for students in Business. In Sweden, Uppsala University.

UNDERGRADUATE STUDIES

University Honors Program

Anne Arundel Hall, (301) 405-6771/3

<http://www.inform.umd.edu/EdRes/Colleges/HONR>

Director: Mack

The University Honors Programs offers the most talented students on campus special educational opportunities and resources. Honors students combine Honors course work with regular electives and studies in their major to deepen their total educational experience. First- and second-year undergraduates broaden their intellectual horizons by selecting Honors seminars and Honors versions of regular courses in the arts and sciences, most of which fulfill CORE (general education) requirements. They may earn the Honors Citation by fulfilling all requirements in five semesters. Juniors and seniors may continue taking Honors seminars, teach in two one-credit colloquia for first-year students, and apply to more than 30 departmental or college Honors programs that provide opportunities to work closely with faculty mentors on independent research projects.

Honors seminars offer small (12-20 students) academic experiences characterized by active participation, intensive writing, and faculty who encourage critical thinking and reflective learning. A course entitled *Knowledge and Its Human Implications* provides second-semester Honors students with the option of a challenging, interdisciplinary common intellectual experience.

Anne Arundel Hall, the Honors Living/Learning Center, houses 100 of the Honors students, program staff, scholar-in-residence, computer lab, Portz Library, seminar rooms, and lounges. Other Honors students live and study together in Queen Anne's Hall, Denton Hall and on designated Honors floors in various other residence halls.

Qualified first-year entering students are invited into Honors; transfer students with between 12 and 30 credits (excluding AP credits) will be considered for admission. Transfer students with more than 30 credits transferring from an Honors program in their previous school should contact the University Honors Program for information about campus Honors opportunities. Most departmental and college Honors programs begin in the junior year. Please contact departments or colleges directly for admission requirements.

For more information, write Director, University Honors Program, Anne Arundel Hall, University of Maryland, College Park, Md., 20742, or call 405-6771.

Gemstone

2157 A.V. Williams Building, (301) 405-8047

<http://www.isr.umd.edu/gemstone/>

Faculty Director: Dr. Christopher Davis

The Gemstone program brings together the top undergraduate honors students from many disciplines, including business; engineering; journalism; the social sciences; agriculture and natural resources; the arts and sciences; computer, mathematical, and physical sciences; and the life sciences. As first-year students, Gemstone participants form interdisciplinary teams that work with a faculty mentor for three years analyzing and investigating important societal problems. Gemstone students enjoy a stimulating living/learning environment on special Gemstone floors in the residence halls. The culmination of the project is a book-length team thesis completed in the senior year. The senior year also includes a research conference. Prior to graduation, a final presentation will be made to an evaluation panel of faculty advisers and experts in area of study.

Gemstone projects vary from year to year. Recent teams have worked on issues including next generation mass transportation, reclamation of the Chesapeake Bay, and information technology and medicine. Gemstone students enroll in a series of three three-credit, specially-designed courses that examine the relationship between technological innovation and society from historical, sociological, and economic perspectives. Under the guidance of a faculty mentor, each Gemstone team focuses its research on challenges associated with technological change and its role in driving societal change. The interdisciplinary nature of the teams will enable examination of these issues from different perspectives. Additionally, students enroll in two-credit seminars where each team meets regularly with the faculty mentor.

For additional information, please contact Dr. Vickie Claflin, Assistant Director, Gemstone Program, at the address and phone number above or by E-mail at vclaflin@isr.umd.edu.

Honors Humanities

For information, please see College of Arts and Humanities entry in chapter 6.

College Park Scholars Program

1125 Cumberland Hall, (301) 314-CPSP (2777)

<http://www.inform.umd.edu/SCHOLAR>

Executive Director: Katherine C. McAdams

College Park Scholars is an innovative two-year living/learning program for academically talented students. Upon admission to the program, College Park Scholars choose one of the multidisciplinary academic programs as a focus, and have an opportunity to live together with other students in that program in specially designated Scholars' residence halls. For Fall 1999, 12 programs are available:

Advocates for Children

American Cultures

Arts

Business, Society, and the Economy

Earth, Life and Time

Environmental Studies

International Studies

Life Sciences

Media, Self and Society

Public Leadership

Science, Discovery, and the Universe

Science, Technology and Society

Students in each program attend weekly, faculty-led colloquia focused on thematic topics related to their Scholars' program. The colloquia are interactive, engaging students in discussion and debate with prominent experts in various fields. Students also have an opportunity to enroll in specially designed sections of the first-year writing courses. The various College Park Scholars curricula allow students to fulfill their general education (CORE) requirements by choosing clusters of courses with their theme in mind. Every program has an experiential learning component; Scholars choose from independent research projects with their faculty mentors, service learning projects, and a variety of internships both on and off campus.

The College Park Scholars' residence halls form a collaborative living/learning community where students meet faculty in their offices, organize study groups on their floors, and join guest speakers for dinner in the dining hall. A diverse student population enriches all the Scholars' experiences, and directors encourage students with different experiences and backgrounds to take leadership roles in both the curricular and extracurricular programs. In addition, students in all the programs are offered opportunities to participate in faculty-led study abroad experiences between semesters or during the summer.

College Park Scholars are encouraged to take advantage of global access to information through the Internet and World Wide Web connections available in the residence halls. Students use electronic mail to communicate with their faculty directors, other students, and pen pals across the country and around the world.

At the successful completion of the Scholars curriculum, students receive a College Park Scholars citation on their transcript. Then, in their junior year, College Park Scholars have an opportunity to apply to their departmental or college honors programs.

For more information on any of the programs identified above, please write to Executive Director, College Park Scholars, 1125 Cumberland Hall, University of Maryland, College Park, MD 20742-9331, or call (301) 314-2777.

Individual Studies Program (IVSP)

Division of Letters and Sciences
0110 Hornbake Library, (301) 314-9403

IVSP Coordinator: Lisa Tenley

The Individual Studies Program provides an opportunity for students to create and complete individualized majors. To be accepted into the program, a student must:

- 1) have a clearly-defined academic goal which cannot reasonably be satisfied in an existing curriculum at College Park;
- 2) be able to design, with faculty assistance, a sequence of courses and other learning experiences which is judged to have adequate substance for the awarding of a degree in the special field of study; and
- 3) have at least a 2.0 GPA and earn a minimum grade of C in designated major courses.

Most IVSP majors are either a form of "area study" utilizing offerings from many departments, or a clear combination of two or more disciplines. Many include internships or independent study projects in the program. All work is done under the supervision of a faculty adviser.

Applicants are required to write a detailed prospectus outlining their proposed program of study. They must meet the general education requirements according to year of entry. The process of applying often involves considerable consultation and several drafts of a prospectus, so it should be begun as early as possible. Students may be admitted to the Individual Studies Program after completion of 30 college credits at the University of Maryland, College Park, and must be officially approved by the Individual Studies Faculty Review Committee prior to the final 30 credits. Individual Studies programs must be approved before students can declare Individual Studies as a major.

Individual Studies provides three courses specifically for its majors: IVSP 317, a one-credit progress report graded Satisfactory/Fail; IVSP 318, an independent study course which students can use for a variety of out-of-class internship and research opportunities (a variable-credit course, it may be taken for a total of nine credits towards the degree); and IVSP 420, Senior Paper/Project, required for all students during the final semester. The project is evaluated by three faculty members.

More information on requirements and procedures is available from Lisa Tenley, IVSP Coordinator, 0110 Hornbake Library, (301) 314-9403 or (301) 314-9891.

Course Code: IVSP

PRE-PROFESSIONAL PROGRAMS

(Pre-Dental Hygiene, Pre-Dentistry, Pre-Law, Pre-Medical and Research Technology, Pre-Medicine, Pre-Nursing, Pre-Optometry, Pre-Osteopathic Medicine, Pre-Pharmacy, Pre-Physical Therapy, Pre-Podiatric Medicine, Pre-Veterinary Medicine)

Advising for Law and the Health Professions
Division of Letters and Sciences

Assistant Director for Pre-Professional Advising: Lisa Bradley
0110 Hornbake Library, (301) 405-2793
Advisers: Health professions: Lisa Bradley, Christy Botdorf
Law: Bruce Adelson

General Information

Pre-professional programs are designed to provide the necessary academic foundation required for entrance into professional schools. Some students may be admitted to programs after two to three years of study but most students are admitted only after the completion of a bachelor's degree.

All pre-professional programs are advisory ONLY and, except in certain limited circumstances as described herein, these programs may not be declared as the official undergraduate major. Students interested in such programs may choose from a wide variety of academic majors. No specific major is required, favored, or preferred by professional schools. The pre-professional adviser can provide guidance concerning the choice of major. Undecided students may enter the Division of Letters and Sciences until they select a major.

Of particular interest to allied health students, the University of Maryland, College Park offers the opportunity to complete courses required for admission into professional programs in the areas of dental hygiene, medical technology, nursing, pharmacy, and physical therapy. **However, the University of Maryland, College Park, does not offer an academic degree (nor certificate/diploma) in any of the aforementioned areas. Students who intend to apply to a professional curriculum must adhere to the policy set forth by the University of Maryland which states that students have until the accumulation of 56 credits to declare a degree-granting major.**

Allied health students may select from any of the degree-granting majors offered at the University of Maryland, College Park in deciding an appropriate major. Most professional schools for Allied Health programs tend to allow student discretion in selecting a major and do not give preference to one major over another. Popular majors for each of the pre-professional areas have been indicated within each subcategory. The academic advisers in the Division of Letters and Sciences and the allied health adviser can assist students in this process.

Successful completion of a pre-professional program at College Park does not guarantee admission to any professional school. Each professional school has its own admissions requirements and criteria, which may include grade point average in undergraduate courses, scores on admissions tests, a personal interview, faculty recommendations, and an evaluation from the pre-professional adviser. For admissions requirements, the student is urged to study the catalog of each professional school.

All students are welcome to use the Law and Health Professions Resource Room in 0110 Hornbake for information on careers and on professional schools across the country.

Pre-Dental Hygiene

The Pre-Dental Hygiene program is designed to prepare students for entrance into the professional curriculum for Dental Hygiene at the University of Maryland at Baltimore and other institutions which offer Dental Hygiene programs. This is not intended as a Pre-Dental major.

144 Pre-Professional Programs

Popular majors for students interested in dental hygiene include health, nutrition and food science, and biology. However, any major is suitable as long as all prerequisite courses are completed. The Division of Letters and Sciences will assist students in making an appropriate major selection.

The Dental School of the University of Maryland (UMAB), located in Baltimore, offers a baccalaureate program in dental hygiene, as well as a post-certificate program for registered dental hygienists who have completed a two-year accredited dental hygiene program and are interested in completing the requirements for a bachelor's degree. Completion of this two-year pre-professional curriculum is required before admission to UMAB for the two professional years. Admission into the professional program is not guaranteed.

Pre-Professional curriculum for University of Maryland, College Park, students planning to apply to the professional program at Baltimore:

	Semester Credit Hours
ENGL 101—Introduction to Writing	3
BIOL 105—Principles of Biology I.....	4
CHEM 103—General Chemistry I.....	4
CHEM 104—Fundamentals of Organic and Biochemistry OR	
CHEM 233—Organic Chemistry	4
PSYC 100—Introduction to Psychology.....	3
SOCY 100 OR SOCY 105—Introduction to Sociology OR	
Introduction to Contemporary Social Problems	3
MATH 113 (college algebra with applications OR	
MATH 115 (Pre-calculus).....	3
COMM 100 OR COMM 107—Foundations of Speech Communication OR	
Speech Communication: Principles and Practice	3
Elective.....	3
ZOOL 201 and ZOOL 202—Human Anatomy and Physiology I, II	4, 4
MICB 200—General Microbiology	4
NFSC 100*—Nutrition for Health Services	3
ENGL 291 (or 391-395 for juniors).....	3
Social Sciences.....	6
Humanities	6
Statistics 100 or higher	3

The above pre-requisite courses are applicable only to the University of Maryland, Baltimore, professional dental hygiene program. Many different professional dental hygiene programs are offered across the country. These have requirements which may be different from those set by the University of Maryland, Baltimore. For more information regarding requirements of other programs, please visit the Law and Health Professions Advising Office. Students should meet with the Allied Health Adviser during their first semester at the University of Maryland, College Park.

Application and Admission

High school students who wish to enroll in the pre-dental hygiene curriculum at College Park should request applications directly from the Admissions Office, the University of Maryland, College Park, MD 20742. It is recommended that those preparing for a baccalaureate program in dental hygiene pursue an academic program in high school which includes biology, chemistry, math, and physics.

Pre-dental hygiene students should begin the application process for professional school in fall of the sophomore year. Assistance with the application process is available in the advising office. Enrollment as a pre-dental hygiene student or as a registered dental hygienist does not guarantee admission into the professional phase of Dental Hygiene.

Further Information

At College Park contact the Pre-Dental Hygiene Adviser, 1117/0110 Hornbake Library, the University of Maryland, College Park, MD 20742, (301) 405-2793. In Baltimore, contact the Office of Recruitment and Admissions, University of Maryland, School of Dentistry, 666 W. Baltimore Street, Baltimore, MD 21201, (410) 706-7472.

Pre-Dentistry Adviser: Bradley

The pre-professional program for pre-dental students is a program of advising for students preparing to apply to dental school. The advice is based on requirements and recommendations of American dental schools and the requirements for a baccalaureate at College Park.

The recommendations made during advising are meant to prepare the student to take the Dental Admissions Test (DAT) in the spring of the junior year. Application to dental school is made during the summer-fall of the senior year. In addition to faculty letters of recommendation, most admissions committees request or require an evaluation from the student's pre-dental adviser. It is important, therefore, for the student to contact the pre-dental adviser early in the academic career and to become familiar with the proper procedures necessary in the evaluation and application process.

For more information on the pre-dental advising program, contact the Pre-Dental Adviser, 1117/0110 Hornbake Library, University of Maryland, College Park, MD, 20742, (301) 405-2793.

There are two ways to prepare for admission to dental school: a four-year program is preferable, but a three-year program is possible.

Four-Year Baccalaureate Program

Most pre-dental students at College Park complete a four-year undergraduate degree prior to entrance into dental school. Students are encouraged to pursue a diversified curriculum, balancing humanities courses with science and mathematics courses. No specific major is required, favored, or preferred by dental school admissions committees.

The four-year student will plan an undergraduate experience which includes courses to satisfy major and supporting area requirements, general education requirements, and the dental school admission requirements. The student's academic adviser will advise about the first two topics, while the Pre-Dental Adviser will advise about dental school admission requirements.

Although specific admission requirements vary somewhat from dental school to dental school, the undergraduate courses which constitute the basic admission requirements and which prepare the student for the DAT are the following:

	Semester Credit Hours
ENGL 101 and 391—English Composition	3, 3
CHEM 103, 113—General Chemistry I, II	4, 4
CHEM 233, 243—Organic Chemistry I, II	4, 4
PHYS 121, 122 or PHYS 141, 142—Physics	4, 4
Biology, minimum*	8

*Although the minimum biology requirement is eight credits, the successful applicant will have more, including advanced training in biological sciences at the 300- to 400-level. BIOL 101, 102, and 124, and MICB 100 should not be taken to meet this requirement.

Three Year Arts-Dentistry Degree Program

At the beginning of their third year, students whose performance during the first two years is exceptional may consider applying to the University of Maryland School of Dentistry after three years of college work rather than the usual four, under the combined arts-dentistry program. By the end of the third year at College Park, the student must have earned 90 academic credits, the last 30 of which must have been earned in residence. Within the 90 credits, the student must have completed all the general education requirements. In addition, because there are certain basic admission requirements which also prepare the student for the Dental Admissions Test, the 90 credits would include the following:

	Semester Credit Hours
CHEM 103, 113—General Chemistry I, II	4, 4
(or CHEM 143, 153—General and Analytical Chemistry I, II)	5, 5
CHEM 233, 243—Organic Chemistry I, II.....	4, 4
PHYS 121, 122—Fundamentals of Physics I, II.....	4, 4
(or PHYS 141, 142—Principles of Physics I, II)	4, 4
*Biological Science (minimum)	8

*Although the minimum biology requirement is eight credits, the successful applicant will likely have more, including advanced training in biological sciences at the 300-400 level. PBIO 100 and 101, BIOL 101 and 102, and MICB 100 may not be taken to meet this requirement. It should also be noted that many other schools of dentistry require mathematics (Calculus). Additional courses in biological sciences are suggested.

Incoming students interested in this three-year combined degree program are strongly urged to consult the pre-dental adviser before registration for the first semester at College Park.

Students accepted in the combined arts-dentistry program receive the B.S. degree (Arts-Dentistry) after satisfactory completion of the first year at the University of Maryland School of Dentistry upon the recommendation of the Dean of the School of Dentistry and approval of the University of Maryland, College Park. The Bachelor of Arts degree is awarded by the University of Maryland, College Park in August following the first year of dental school. The courses of the first year of dental school constitute the major; the courses listed above constitute the supporting area.

Participation in the first three years of the combined degree program at College Park in no way guarantees admission to the University of Maryland School of Dentistry. Three-year students compete with four-year students for admission. It is therefore desirable to ensure that the work of the first three years be selected in such a way that the requirements of one of the normal College Park majors can be completed during a fourth year at College Park.

Pre-Law

1117 Hornbake Library, (301) 405-2793/(301) 314-8418
Adviser: Adelson

Most law schools prefer applicants with a B.A. or B.S. degree; however, in some cases law schools will consider truly outstanding applicants with only three years of academic work. Most law schools do not prescribe specific courses which a student must present for admission, but do require that the student follow one of the standard programs offered by the undergraduate college. Law schools require that the applicant take the Law School Admission Test (LSAT), preferably in July, October, or December of the academic year preceding entry into professional school.

Four-Year Baccalaureate Program

No particular undergraduate major or special undergraduate courses are prerequisites for admission into law school. Students are encouraged to select a major in which they have a strong interest and expect to perform well. Course selections should be guided by the need to develop skills which are essential in preparing to perform well in law school, on the Law School Admissions Test (LSAT), and ultimately as a lawyer. These skills include imaginative and coherent thinking, critical reasoning, accurate and perceptive reading, and a strong command of the spoken and written language, including grammar. A broad liberal arts background with evidence of a high quality of work will provide a strong foundation for law school.

Three-Year Arts-Law Degree Program

The University of Maryland, College Park, has cooperative agreements with the University of Maryland, Baltimore, School of Law and the University of Baltimore Law School that allow College Park students enrolled in any recognized major who meet certain requirements to enter law school **before obtaining the undergraduate degree.**

Requirements that must be completed **before** the beginning of the first semester of law school are (1) at least 90 undergraduate credits, 30 of which must be earned at College Park; (2) completion of all university and general education requirements; (3) 18 credits in one department applicable to a recognized major with at least six of those credits at the 300/400 level; and (4) minimum grades of C achieved in courses in the major field.

Students who fulfill these requirements may apply directly to the University of Maryland, Baltimore, School of Law and/or the University of Baltimore Law School. If applying to either of these programs, the optimal time to take the LSAT is the June preceding the student's junior year. Application to law school is then made in the fall semester of the junior year.

If accepted by the law school, the student begins law school without an undergraduate degree. Upon successful completion of the first year of law school, the student may apply for the baccalaureate by returning to the College Park campus and providing official transcripts of the first year of law school. Credits earned during the first year of law school are treated as if they had been earned at College Park. If the student's total credits meet the above requirements and total at least 120, the student will be awarded an undergraduate degree certifying completion of the Arts/Law program.

This accelerated program is available only with University System of Maryland schools and will not be an option for all students. Students considering this program should make an appointment to meet with the pre-law adviser as soon as possible.

For additional information, contact the Pre-Law Adviser, 1117/O110 Hornbake Library, (301) 405-2793.

Pre-Medical and Research Technology

The Pre-Medical and Research Technology program is designed to prepare students for entrance into the professional curriculum for Medical and Research Technology. Popular majors for students interested in MedTech include biology, chemistry, and health; however, any major is suitable as long as all prerequisite courses are completed. The Division of Letters and Sciences will assist students in making an appropriate major selection.

NOTE: THIS IS NOT INTENDED AS A PRE-MED PROGRAM

A Bachelor of Science degree in Medical and Research Technology is offered through the Medical and Research Technology Department of the University of Maryland Medical School, located in Baltimore as well as other institutions throughout the country. Completion of this two-year pre-professional curriculum is required **before** admission to the professional curriculum at UMAB. Part-time study is possible.

Application and Admission

High school students who wish to enroll in this curriculum at College Park must meet this institution's admission requirements. While in high school, students are encouraged to enroll in a college preparatory curriculum emphasizing biology, chemistry, and college preparatory mathematics.

Pre-Medical and Research Technology students should begin the application process for professional school in fall of the sophomore year. Assistance with the application process is available in the advising office. Enrollment as a pre-professional student does not guarantee admission into a medical technology program.

Pre-Professional curriculum for University of Maryland, College Park, students planning to apply to the professional program at Baltimore:

	Semester Credit Hours
CHEM 103, 113—Gen. Chem I, II.....	4, 4
CHEM 104 or CHEM 233 (organic chemistry).....	4
BIOL 105—Principles of Biology I.....	4
ZOOL 201 and 202, Anatomy and Physiology I and II.....	4, 4
MICB 200—Gen. Microbiology.....	4
MATH 110 or 113 or 115.....	3
CMSC 103 or higher.....	3
STAT 100 or higher.....	3
ENGL 101—Introduction to Writing.....	3
Literature or English elective.....	3
Humanities (History, Literature, Philosophy, appreciation of Art, Music, Drama, Dance).....	3
Behavioral and Social Sciences (Anthropology, Economics, Government & Politics, Geography, Psychology, Sociology).....	6
Electives*.....	8
Total Semester Hours.....	60

*May not include health or physical education.

The above pre-requisite courses are applicable only to the University of Maryland, Baltimore, professional medical and research technology program. Many different professional medical and research programs are offered across the country. These have requirements which may be different from those set by the University of Maryland, Baltimore. For more information regarding requirements of other programs, please visit the Law and Health Professions Advising Office. Students should meet with the Allied Health Adviser during their first semester at the University of Maryland, College Park.

Further Information

At Maryland, contact the Medical and Research Technology Adviser, University of Maryland, 1117/O110 Hornbake Library, College Park, MD 20742, (301) 405-2793. In Baltimore, contact the Medical and Research Technology Program, University of Maryland, Allied Health Professions Building, 100 S. Penn Street, Baltimore, MD 21201, (410) 706-7664.

Pre-Medicine

Adviser: Bradley

The pre-professional program for pre-medical students is a program of advising for students preparing to apply to medical school. The advice is based on requirements and recommendations of American medical schools and the requirements for a bachelor's degree at College Park. The pre-medical adviser is prepared to assist students in setting career objectives, selecting undergraduate course work to meet the admissions criteria of the professional schools, and in all phases of the application process itself.

The recommendations made during advising are meant to prepare the student to take the Medical College Admission Test (MCAT) in the spring of the junior year or the following summer. Application to medical school is made during the summer-fall of the senior year. Medical school admissions committees generally request or require an evaluation from the student's pre-medical adviser. It is important, therefore, for the student to contact the pre-medical adviser early in the academic career and to become familiar with the proper procedures necessary in the evaluation and application process.

For more information on the pre-medical advising program, contact the Pre-Medical Adviser, 1117/0110 Hornbake Library, The University of Maryland, College Park, MD 20742, (301) 405-2793.

There are two ways to prepare for admission to medical school; a four-year program is preferable, but a three-year program is possible.

Four-Year Baccalaureate Program

Most pre-medical students at College Park complete a four-year undergraduate degree prior to entrance into medical school. Students are encouraged to pursue a diversified curriculum, balancing humanities courses with science and mathematics courses. No specific major is required, favored, or preferred by medical school admissions committees.

The four-year student will plan an undergraduate experience which includes courses to satisfy major and supporting area requirements, general education requirements, and the medical school admission requirements. The student's academic adviser will advise about the first two topics, while the pre-medical adviser will advise about medical school admission requirements.

Although specific admission requirements vary somewhat from medical school to medical school, the undergraduate courses which constitute the basic admission requirements and which prepare the student for the MCAT are the following:

	Semester Credit Hours
ENGL 101 AND 391, 393, or 395—English Composition.....	3, 3
CHEM 103, 113—General Chemistry I, II	4, 4
CHEM 233, 243—Organic Chemistry I, II.....	4, 4
PHYS 121, 122, or PHYS 141, 142—Physics.....	4, 4
MATH 220, 221, or MATH 140, 141—Calculus	3, 3
or	4, 4
Biology, minimum**	8

*Although calculus is not an entrance requirement of all medical schools and is not included in the MCAT, one year of calculus is strongly recommended for the pre-professional student.

Although the minimum biology requirement is eight credits, the successful applicant will have more, including advanced training in biological sciences at the 300-400 level. BIOL 101, 102 and 124, and MICB 100 should **not be taken to meet this requirement.

Three-Year Arts-Medicine Degree Program

At the beginning of their third year, students whose performance during the first two years is exceptional may consider applying to the University of Maryland School of Medicine after three years of college work rather than the usual four, under the combined Arts-Medicine program. By the end of the third year at College Park, the student must have earned 90 academic credits, the last 30 of which must have been earned in residence. Within the 90 credits, the student must have completed all the general education requirements. In addition, because there are certain basic admission requirements which also prepare the student for the Medical College Admissions Test (MCAT), the 90 credits would include the following:

	Semester Credit Hours
CHEM 103, 113—General Chemistry I, II	4, 4
or CHEM 143, 153—General and Analytical Chemistry I, II.....	5, 5
CHEM 233, 243—Organic Chemistry I, II	4, 4
PHYS 121, 122—Fundamentals of Physics I, II	4, 4
or PHYS 141, 142—Principles of Physics I, II	4, 4
MATH 220, 221	3, 3
or MATH 140, 141—Calculus	4, 4
*Biological Science (minimum)	8

*Although the minimum biology requirement is eight credits, the successful applicant will likely have more, including advanced training in biological sciences at the 300-400 level. PBIO 100, 101, BIOL 101 and 102, and MICB 100 may **not** be taken to meet this requirement. It should also be noted that the best preparation for the MCATs and for admission to most schools would include additional courses in biology.

Incoming students interested in this three-year combined degree program are strongly urged to consult the pre-medical adviser before registration for the first semester at College Park.

Students accepted in the combined Arts-Medicine Program receive the B.S. degree (Arts-Medicine) after satisfactory completion of the first year at the University of Maryland School of Medicine upon recommendation of the Dean of the School of Medicine and approval of the University of Maryland, College Park. The Bachelor of Arts degree is awarded by the University of Maryland, College Park in August following the first year of medical school. The courses of the first year of medical school constitute the major; the courses listed above constitute the supporting area.

Participation in the first three years of the combined degree program at College Park in no way guarantees admission to the University of Maryland School of Medicine. Three-year students compete with four-year students for admission. It is therefore desirable to ensure that the work of the first three years be selected in such a way that the requirements of one of the normal College Park majors can be completed during a fourth year at College Park.

Pre-Nursing

College Park students may prepare themselves not only for entrance into the professional curriculum for Nursing at UMAB, but also for entrance into nursing programs at other colleges and universities. To do this efficiently, students should obtain program information when first entering college so that requirements can be taken in normal sequence. Information for the University of Maryland School of Nursing and other area programs are available at the advising office, room 0110, Hornbake Library.

The School of Nursing, located in Baltimore at the University of Maryland at Baltimore, offers a four-year program leading to the Bachelor of Science degree in nursing. Completion of a two-year pre-professional curriculum is required before admission to UMAB for the two professional years. A second-degree option is also offered.

Application and Admission

High school students who wish to enroll in the pre-nursing curriculum at College Park must meet admission requirements of that institution. While in high school, students should enroll in a college preparatory curriculum including biology, chemistry, and at least three units of college preparatory mathematics.

Pre-nursing students should begin the application process for professional school in fall of the sophomore year. Assistance with the application process is available in the advising office. Enrollment as a pre-nursing student does not guarantee admission to the nursing program at UMAB. Popular majors for students interested in Nursing include: nutrition, health, and psychology; however, any major is suitable as long as all prerequisite courses are completed. The Division of Letters and Sciences will assist students in making an appropriate major selection.

Pre-Professional curriculum for University of Maryland, College Park students:

	Semester Credit Hours
CHEM 103, 104—General Chemistry I, Fundamentals of Organic and Biochemistry.....	4, 4
ENGL 101—Introduction to Writing	3
ENGL 291 or ENGL 391—Intermediate Writing or	

Advanced Composition.....	3
BIOL 105 (Prerequisite for MICB 200).....	4
MATH 110—Elementary Mathematical Models (or higher).....	3
Humanities* (Literature, History, Philosophy, Math, Fine Arts, Language, Speech).....	9
PSYC 100—Introduction to Psychology.....	3
SOCY 100—Introduction to Sociology or 105 Introduction to Contemporary Social Problems.....	3
EDHD 320—Human Development Through The Lifespan.....	3
Other social sciences (Sociology, Psychology, Anthropology, Government and Politics, Economics, Geography).....	3
ZOOL 201, 202—Human Anatomy & Physiology I,II.....	4, 4
MICB 200—General Microbiology.....	4
NFSC 100—Elements of Nutrition.....	3
Elective.....	6
Total.....	63

*Must include at least one course which is not Mathematics or English.

The above pre-requisite courses are applicable only to the University of Maryland, Baltimore, professional nursing program. Many different professional nursing programs are offered across the country. These have requirements which may be different from those set by the University of Maryland, Baltimore. For more information regarding requirements of other programs, please visit the Law and Health Professions Advising Office. Students should meet with the Allied Health Adviser during their first semester at the University of Maryland, College Park.

Further information

At Maryland, contact the Nursing Adviser, 0110 Hornbake Library, College Park, MD 20742, (301) 405-2793. In Baltimore, contact the Office of Admissions, The University of Maryland School of Nursing, 655 W. Lombard Street, Baltimore, MD 21201, (800) 328-8346.

Pre-Optometry

Adviser: Bradley

Requirements for admission to schools and colleges of optometry vary somewhat, and the pre-optometry student should consult the catalogs of the optometry schools and colleges for specific admission requirements. A minimum of two years of pre-optometry studies is required for admission to all accredited schools, and about half of the schools require a minimum of three years. At present, more than two-thirds of successful applicants hold a bachelor's or higher degree. Students who contemplate admission to optometry schools may major in any program that the University offers, but would be well-advised to write to the optometry schools of their choice for specific course requirements for admission. In general, pre-optometry students should follow a four-year baccalaureate program which includes the following:

	Semester Credit Hours
Biology and Microbiology and Physiology.....	4-12
Inorganic Chemistry.....	8
Organic Chemistry.....	4-8
Physics.....	8
Math through differential calculus.....	6
English.....	6
Psychology.....	3-6
Statistics.....	3
Social Sciences.....	6

For additional information on pre-optometry studies, contact the Pre-medical Adviser, 1117 Hornbake Library, the University of Maryland, College Park, MD 20742, (301) 405-2793.

Pre-Osteopathic Medicine

Adviser: Bradley

The pre-professional requirements for osteopathic medical school are essentially identical to those for allopathic medical school, and the student is referred to the pre-medicine discussion above.

For additional information on pre-osteopathy studies, contact the Pre-medical Adviser, 1117/0110 Hornbake Library, the University of Maryland, College Park, MD 20742, (301) 405-2793.

Pre-Pharmacy

College Park students may prepare themselves not only for entrance into the UMAB School of Pharmacy, but also for entrance into pharmacy programs at other colleges and universities. To do this efficiently, students should obtain program information when first entering college so that requirements can be taken in normal sequence. Information for the University of Maryland School of Pharmacy is available at the Law & Health Professions Advising Office, 0110 Hornbake Library. Also at this location students may read about other schools of pharmacy.

The School of Pharmacy, located in Baltimore (UMAB), offers a four-year entry-level Doctor of Pharmacy (Pharm.D.) program, offering different paths of concentration, including community practice and clinical pharmacy/pharmacotherapy. Completion of a two-year pre-professional curriculum is required before admission to the School of Pharmacy.

Popular majors for students interested in Pharmacy include: nutrition, biology, chemistry, and psychology; however, any major is suitable as long as all prerequisite courses are completed. The Division of Letters and Sciences will assist students in making an appropriate major selection.

Application and Admission

Applicants for pre-pharmacy at College Park must meet all admission requirements of that institution. While in high school students are encouraged to enroll in a college preparatory curriculum emphasizing biology, chemistry, and college preparatory mathematics.

Pre-pharmacy students should begin the application process for professional school in fall of the sophomore year. Assistance with the application process is available in the advising office. Applications for other programs must be obtained individually from the respective colleges.

Enrollment as a pre-pharmacy student does not guarantee admission to the School of Pharmacy at the University of Maryland at Baltimore (UMAB). Students who are uncertain about their chances of admission to professional school are encouraged to consult the adviser.

Pre-Professional Curriculum for University of Maryland, College Park Students:

	Semester Credit Hours
CHEM 103, 113—General Chemistry I, II.....	4, 4
CHEM 233, 243—Organic Chemistry I, II.....	4, 4
MATH 220—Elementary Calculus I or MATH 140.....	3,4
BIOL 105—Principles of Biology I.....	4
PHYS 121, 122—Fundamentals of Physics I, II.....	4, 4
ENGL 101—Introduction to Writing.....	3
Other English.....	3
Humanities (English, Journalism, Fine Arts, Classics, Modern Language, Philosophy, or Speech).....	6
Social Science (Anthropology, Economics, Geography, History, Government and Politics, Psychology, or Sociology).....	6
Additional Humanities or Social Sciences.....	6
Electives.....	5-6
Total.....	60-62

Further Information

At College Park contact the Pre-Pharmacy Adviser, University of Maryland, 1117/0110 Hornbake Library, College Park, MD 20742, (301) 405-2793. In Baltimore, contact Admissions Committee Chairman, University of Maryland School of Pharmacy, 20 North Pine Street, Baltimore, MD, 21201 (410) 706-7650.

Pre-Physical Therapy

College Park students may prepare themselves not only for entrance into University of Maryland physical therapy programs but also for entrance into physical therapy programs at other colleges and universities. To do this efficiently, students should obtain program information when first entering college so that requirements can be taken in normal sequence. Information for the University of Maryland programs is available at the Health Professions Advising Office, 0110 Hornbake Library. Information about other schools is also available.

148 Certificate Programs

The University of Maryland offers two entry-level masters (MPT) programs in physical therapy, each three years in length. One is offered at the Baltimore City campus (UMAB) and the other at the Eastern Shore campus (UMES) in Princess Anne. Completion of a three-year pre-professional curriculum is required before admission to the three-year professional phase of either program. The first professional year starts in summer at UMAB and in fall at UMES.

Note: Professional curricula may vary in length depending on institutions. Some institutions require a baccalaureate prior to admission. Popular majors for students interested in Physical Therapy include: kinesiology (especially biomedical sequence track), nutrition, psychology and health; however, any major is suitable as long as all prerequisite courses are completed. The Division of Letters and Sciences will assist students in making an appropriate major selection.

Application and Admission

Applicants for the pre-physical therapy program at College Park must meet all of that institution's admission requirements. While in high school students should pursue a college preparatory program. Subjects specifically recommended are biology, chemistry, physics, and at least three units of college preparatory mathematics.

Pre-physical therapy students should begin the application process for professional school about eight months prior to the expected date of enrollment in professional school. UMAB or UMES applications and instructions are available in the advising office.

Enrollment as a pre-physical therapy student does not guarantee admission to the physical therapy programs at either UMAB or UMES. In view of the heavy competition for admission, all applicants are encouraged to apply to several programs. This entails investigating schools in other states and other geographic regions.

Pre-Professional Curriculum for University of Maryland, College Park Students Applying to UMAB:

	Semester Credit Hours
CHEM 103, 104*—General Chemistry I, Fundamentals of Organic & Biochemistry	4,4
PHYS 121, 122—Fundamentals of Physics I & II	4,4
BIOL 105—Principles of Biology	4
Biological science elective	4
ZOOL 211—Cell Biology and Physiology	4
MATH 220—Elementary Calculus I or MATH 140	3 or 4
Statistics (see adviser)	6
CMSC 103—Introduction to Computing	3
PSYC 100—Introduction to Psychology	3
Personality or Development Psychology	3
EDHD 320—Human Growth & Development	3
ENGL 101—Introduction to Writing	3
ENGL 291 or 391 or 395—Intermediate or Advanced Writing	3
General Education (see adviser)	21
Electives	14
TOTAL	90-91

*CHEM 113 may be substituted for CHEM 104.

Curriculum must include at least 15 credits in upper-level course work.

Pre-Professional Curriculum for University of Maryland, College Park Students Applying to UMES:

	Semester Credit Hours
CHEM 103, 104*—General Chemistry I, Fundamentals of Organic & Biochemistry	4,4
PHYS 121, 122—Fundamentals of Physics I,II	4,4
BIOL 105—Principles of Biology	4
ZOOL 201, 202—Human Anatomy & Physiology I, II	4,4
ZOOL 211—Cell Biology and Physiology	4
MATH 115—Pre-calculus	3
Statistics	3
PSYC 100—Introduction to Psychology	3
Additional Psychology (abnormal or child)	3
ENGL 101—Introduction to Writing	3
English (including at least one additional writing course)	6
COMM 100—Foundations of Speech Communication	3
OR COMM 107—Speech Communication: Principles and Practice	3
Arts & Humanities (Literature, Foreign Language, Philosophy, or Fine Arts [non-studio])	6
Health Education	2
Physical Activities	2

Electives (see adviser)	24
TOTAL	90

*CHEM 113 may be substituted for CHEM 104.

**Requirements for UMES vary for applicants with an undergraduate degree.

The above pre-requisite courses are applicable only to the University of Maryland, Baltimore, and the University of Maryland, Eastern Shore, professional physical therapy programs. Many different professional dental hygiene programs are offered across the country. These have requirements which may be different from those set by the University of Maryland, Baltimore. For more information regarding requirements of other programs, please visit the Law and Health Professions Advising Office. Students should meet with the Allied Health Adviser during their first semester at the University of Maryland, College Park.

Further information

At Maryland, contact the Pre-Physical Therapy Adviser, 1117/0110 Hornbake Library, College Park, MD 20742, (301) 405-2793. At UMES, contact Dr. Raymond Blakely, Department of Physical Therapy, UMES, Princess Anne, MD 21853, (410) 651-6301. In Baltimore, contact the Department of Physical Therapy, 100 S. Penn Street, Baltimore, MD 21201, (410) 706-7720.

Pre-Podiatric Medicine

Adviser: Bradley

The pre-professional requirements for podiatric medical school are essentially identical to those for allopathic medical school, and the student is referred to the pre-medicine discussion above.

For additional information on pre-podiatry studies, contact the Pre-medical Adviser, the University of Maryland, 1117/0110 Hornbake Library, College Park, MD 20742, (301) 405-2793.

Pre-Veterinary Medicine

Advisers: Loizeaux, Stephenson

University of Maryland, College Park students interested in veterinary medicine are eligible for a special degree program offered through the College of Agriculture and Natural Resources. Through this program (see College of Agriculture and Natural Resources entry in chapter 6), students may earn a combined Bachelor of Sciences degree in Agriculture and Veterinary Medicine.

Students within any major also may prepare for admission to veterinary school by completing required courses. Students should consult catalogs from the veterinary schools in which they are interested. Minimum requirements for most programs include the following:

University of Maryland, College Park, CORE Requirements
 BIOL 105, 106, 222
 CHEM 103, 113, 233, 243
 BCHM 261 or 461; MICB 200
 PHYS 121 (or 141), 122 (or 142)
 MATH 220 (or 140) and 3 credits of other mathematics

Students should seek pre-veterinary advising through the Director, Center for Government and Corporate Veterinary Medicine, 1213 Avram Gudelsky Veterinary Center, University of Maryland, College Park, MD 20742-3711, (301) 935-6083, ext. 116 or 106.

CERTIFICATE PROGRAMS

Afro-American Studies Certificate

College of Behavioral and Social Sciences
 2169 LeFrak Hall, (301) 405-1158

The Afro-American Studies Certificate program offers the opportunity to develop a specialization in African-American studies while pursuing a major in another field. Certificate students learn about the social, economic, political, and cultural history of African-American people through a concentration of courses (21 credit hours). Courses taken toward the certificate also may be used to satisfy CORE requirements and electives.

Undergraduates in good standing may apply for the program by contacting the academic adviser of the Afro-American Studies Program in 2169 LeFrak Hall. Students pursuing the certificate must meet the University's general education (CORE) and department requirements.

See the complete description in the alphabetical list of programs.

East Asian Studies Certificate

College of Arts and Humanities

2101B Francis Scott Key Hall, (301) 405-4309

The Undergraduate Certificate in East Asian Studies is a 24-credit course of instruction designed to provide specialized knowledge of the cultures, histories, and contemporary concerns of the peoples of China, Japan, and Korea. It will complement and enrich a student's major. The curriculum focuses on language instruction, civilization courses, and electives in several departments and programs of the university. It is designed specifically for students who wish to expand their knowledge of East Asia and demonstrate to prospective employers, the public, and graduate and professional schools a special competence and set of skills in East Asian affairs.

Upon satisfactory completion of the courses, with a grade of C or better in each course, and recommendation by the chairperson of the Committee on East Asian Studies, a certificate will be awarded. A notation of the award of the certificate will be included on the student's transcript. The student must have a bachelor's degree awarded previous to or simultaneously with an award of the certificate.

Certificate Requirements

CORE Courses: The student is required to take:

1. HIST 284—East Asian Civilization I
2. HIST 285—East Asian Civilization II
3. Six semester hours of introduction to one of the following East Asian languages (Chinese, Japanese, or Korean):
CHIN 101—Elementary Chinese I
JAPN 101—Elementary Japanese I
KORA 211—Introductory Reading for Speakers of Korean I
KORA 212—Introductory Reading for Speakers of Korean II

Students with language competence equivalent to these language courses are exempted from the language requirement; such students are required to complete an additional six hours of electives in East Asian courses to fulfill the 24-credit requirement for the certificate.

Electives: Students must complete at least 12 hours of electives selected from four regular formally approved courses on East Asia in at least two of the following categories: (1) art history, (2) geography, (3) government and politics, (4) history, (5) language, linguistics, and literature, (6) music, and (7) women's studies. Nine of the 12 hours of electives must be upper-division (300-400 level) courses. A maximum of three credit hours of special topics courses on East Asia will be allowed with the approval of the student's certificate adviser. No more than nine credits from any one department may be applied toward the certificate. No more than nine credits applied to the student's major may also apply to the certificate. In addition, no more than nine credits of the courses applied toward the certificate may be transferred from other institutions. Students are asked to work with their adviser in ensuring that the electives maintain an intercollegiate and interdisciplinary focus (at least three disciplines are recommended).

Interested students should contact Dr. Marlene Mayo, Department of History, Francis Scott Key Hall, (301) 405-4309.

Latin-American Studies Certificate

College of Arts and Humanities

Latin-American Studies Center
4205 Jimenez Hall, (301) 405-6456

The new multidisciplinary certificate program in Latin-American Studies is open to University of Maryland, College Park undergraduates in any major who are interested in international studies and Latin America. The undergraduate Certificate in Latin-American Studies will be awarded to students who have completed 21 credits with a grade of C or better in the following areas.

Requirements for Certificate

A. Core curriculum for all certificate students (12 credits)

LASC/SPAN/PORT 234 Issues in Latin-American Studies I
LASC/SPAN/PORT 235 Issues in Latin-American Studies II
HIST 250 or HIST 251 Latin American History I or II
LASC/SPAN/PORT 458 Senior capstone course in Latin-American Studies

B. Additional courses in Latin-American Studies (9 credits)

Nine credits is additional courses to be chosen from an approved list and from at least two different departments. At least six credits must be at the 300- or 400-level. See Latin-American Studies adviser for details.

C. Foreign Language Competency

All certificate students must demonstrate their competence in either Spanish or Portuguese. Competency may be proven with a grade of C or better in an intermediate-level course (PORT 203, SPAN 201) or higher. Native speakers of Spanish or Portuguese or students with extensive experience in these languages should consult with the Latin-American Studies adviser.

Interested students should contact Dr. Phyllis Peres, 2210 Jimenez Hall, by phone, (301) 405-6456, or by E-mail (pb59@umail); or contact Christina Guidorizzi in the Latin-American Studies Office, 4205 Jimenez Hall, by phone (301) 405-6459 or by e-mail guido@wam.umd.edu.

Science, Technology and Society Certificate

1102 Skinner Hall

E-mail: sts@umail.umd.edu

The undergraduate certificate program in Science, Technology, and Society (STS) offers students an opportunity to expand their understanding of the complex relationships of science, technology, and society and to augment their general scientific and technological literacy. Students in the program may concentrate in one of two tracks: History and Philosophy of Science and Technology (HPST) or Social and Policy Studies of Science and Technology (SPSST). In addition to taking courses in their chosen track, students in each track are required to complete a set of common core requirements (General Fundamental Courses).

Requirements for Certificate:

Students must take 30 credits of STS-approved courses: 9 credits of General Fundamental Courses and 21 credits fulfilling either the HPST or SPSST track requirements. No more than nine credit hours may be applied toward the student's major. A minimum of nine credit hours must be taken in upper-division courses. A maximum of three credit hours of "Special Topics" or "Selected Topics" course may be taken. No more than nine credit hours may be taken at institutions other than the University of Maryland, College Park.

When all requirements for the certification have been completed with a minimum grade of "C" in each course, and after the Director of the program has so recommended, the Registrar will issue a certificate. The certificate will not be issued before the granting of the bachelor's degree.

General Fundamental Courses:

1. A suitable introductory or capstone course. Currently approved courses include GEMS 101 and CPSP 227. Students may propose appropriate alternatives.
2. A course in "technological literacy." Currently approved courses include ENES 100, ENES 105, or upper-division Engineering courses. Students may propose appropriate alternatives.
3. A natural science course satisfying the requirements for a major in that discipline, such as AGRO 302, PHYS 141, ENTM 205, MICB 200, PHYS 141, or ZOOL 210. The course need not have an associated laboratory section.

The History and Philosophy of Science and Technology Track

A. HPST Track Fundamental courses:

150 Certificate Programs

1. One course from the SPSST track fundamental course list drawn from areas 3 or 4, or any SPSST track elective which is NOT listed as an HPST course.
2. One introductory course in the history of science or technology or introductory philosophy of science:
HIST 174—(Introduction to the History of Science)
HIST 175—(Science and Technology in Western Civilization)
PHIL 250—(Philosophy of Science I)
PHIL 256—(Philosophy of Biology I)

3. Three advanced courses in the history of science or technology or philosophy of science, approved by the STS policy committee, with no more than two drawn from each department.
HIST 401—The Scientific Revolution: From Copernicus to Newton
HIST 402—The Development of Modern Physical Science:
From Newton to Einstein
HIST 403—Twentieth Century Revolutions in the Physical Sciences
HIST 404—History of Modern Biology
HIST 406—History of Technology
HIST 407—Technology and Social Change in History
PHIL 450—Scientific Thought I
PHIL 451—Scientific Thought II
PHIL 452—Philosophy of Physics
PHIL 453—Philosophy of Science II

B. HPST Track Electives

Two courses from the above list of advanced courses that were not selected to fulfill the HPST fundamental requirement, or courses from a list prepared by the STS policy committee.

Social and Policy Studies of Science and Technology Track

A. SPSST Track Fundamental Courses

1. One course from the HPST track fundamental course list, or an HPST track elective not listed as an SPSST track elective.
2. A course in economics, such as ECON 105, or ECON 201, approved by the STS policy committee.
3. A course in government, such as GVPT 273 or GVPT 306, approved by the STS policy committee.
4. A social studies of science and technology course, such as SOCY 333 or GEMS 201, approved by the STS policy committee.
5. One course in public policy, such as GVPT 479 or AREC 240, or a course approved by the STS policy committee.

B. SPSST Track Electives

Two courses from a list of courses prepared by the STS policy committee.

Women's Studies Certificate

College of Arts and Humanities

2101 Woods Hall, (301) 405-6877

<http://www.inform.umd.edu/EdRes/Colleges/ARHU/Depts/WomensStudies>

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 Adviser. For additional information, contact the Women's Studies office, (301) 405-6877.

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 credit hours 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, College Park. 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. A core of nine (9) credit hours from the following WMST courses:

WMST 200—Introduction to Women's Studies: Women and Society ...3	OR
WMST 250—Introduction to Women's Studies: Women, Art and Culture.....3	
WMST 400—Theories of Feminism.....3	
WMST 488—Senior Seminar.....3	

2. Distributive courses (9 credit hours). At least one course from each of three distributive areas listed below.

Area I: Arts and Literature

WMST 241—Women Writers of French Expression in Translation (also FREN 241).....3	
WMST 250—Introduction to Women's Studies: Women, Art, and Culture.....3	
WMST 255—Introduction to Literature by Women (also ENGL 255).....3	
WMST 275—World Literature by Women (also CMLT 275).....3	
WMST 281—Women in German Literature and Society (also GERM 281).....3	
WMST 348—Literary Works by Women (also ENGL 348).....3	
WMST 408—Special Topics in Literature by Women before 1800 (also ENGL 408).....3	
WMST 444—Feminist Critical Theory (also ENGL 444).....3	
WMST 448—Literature by Women of Color* (also ENGL 448).....3	
WMST 458—Literature by Women after 1800 (also ENGL 458).....3	
WMST 466—Feminist Perspectives on Women in Art (also ARTH 466).....3	
WMST 496—African-American Women Filmmakers* (also THET 496).....3	
FREN 481—Femmes Fatales and the Representation of Violence in Literature.....3	
FREN 482—Gender and Ethnicity in Modern French Literature.....3	

Area II: Historical Perspectives

WMST 210—Women in America to 1880 (also HIST 210).....3	
WMST 211—Women in America since 1880 (also HIST 211).....3	
WMST 212—Women in Western Europe (also HIST 212).....3	
WMST 320—Women in Classical Antiquity (also CLAS 320).....3	
WMST 492—History of the Sportswoman in American Institutions (also KNES 492).....3	
AASP 498W—Black Women in United States History*.....3	
AMST 418—Cultural Themes in America: Women and Family in American Life.....3	
HIST 309—Proseminar in Historical Writing: Women's History (Special Topic).....3	
HIST 319Z—Special Topics in History: Women in the Middle East*.....3	
HIST 433—Changing Perceptions of Gender Identities in the U.S., 1880-1935.....3	
HIST 493—Victorian Women in England, France, and the United States.....3	
HIST 494—Women in Africa*.....3	
HIST 495—Women in Medieval Culture and Society.....3	

Area III: Social and Natural Sciences

WMST 200—Introduction to Women's Studies: Women and Society ...3	
WMST 313—Women and Science (also ZOO 313).....3	
WMST 325—Sociology of Gender (also SOCY 325).....3	
WMST 326—Biology of Reproduction (also ZOO 326).....3	
WMST 336—Psychology of Women (also PSYC 336).....3	
WMST 360—Caribbean Women*.....3	
WMST 410—Women in the African Diaspora*.....3	
WMST 420—Asian American Women*.....3	
WMST 430—Gender Role Issues in the Family (also FMST 430).....3	
WMST 436—Legal Status of Women (also GVPT 436).....3	
WMST 452—Women in the Media (also JOUR 452).....3	
WMST 471—Women's Health (also HLTH 471).....3	
WMST 493—Jewish Women in International Perspective*.....3	
WMST 494—Lesbian Communities and Difference*.....3	
AASP 498—Special Topics in Black Culture: Women and Work*.....3	
CCJS 498—Special Topics in Criminology and Criminal Justice: Women and Crime.....3	
KNES 451—Sport and the American Woman.....3	
SOCY 425—Gender Roles and Social Institutions.....3	
SOCY 498W—Special Topics in Sociology: Women in the Military.....3	
COMM 324—Communication and Gender.....3	

*Counts toward Women's Studies Cultural Diversity Requirement

3. Courses in Cultural Diversity

Students will select two courses for a minimum of six credits. Approved courses are noted with an asterisk in section 2, above. Courses in this category may overlap with other requirements for the certificate.

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 in Women's Studies and WMST 499: Independent Study.

Advising

To obtain more information, contact the Undergraduate Adviser, (301) 405-6877, or write to Women's Studies Department, 2101 Woods Hall, University of Maryland, College Park, MD, 20742-7415.

Course Code: WMST