

CHAPTER 7

DEPARTMENTS AND CAMPUS-WIDE PROGRAMS

ACCOUNTING

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

AEROSPACE ENGINEERING (ENAE)

A. James Clark School of Engineering

3181 Glenn L. Martin Hall, (301) 405-2376

<http://www.enaе.umd.edu>

Professor and Chair: Fournеy

Professors: Chopra, Lee, Leishman, Lewis

Associate Professors: Akin, Baeder, Barlow, Cell, Pines, Sanner, Vizzini, Wereley, Winkelmann, Yu

Assistant Professors: Atkins, Cadou, Shapiro

Visiting Professors: Bowden, Korkegi, Spence

Martin Professor of Rotorcraft Acoustics: Schmitz

Lecturers: Diaz, Healey, Lewis, Nagaraj, Smith, Van Wic

Emeriti: Anderson, Gessow, Jones

The Major

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

The subdisciplines of Aerospace Engineering are: aerodynamics, flight dynamics, propulsion, structures, and "design". Aerodynamics addresses the flow of air and the associated forces, moments, pressures, and temperature changes. Flight-dynamics addresses the motion of the vehicles including the trajectories, the rotational dynamics, the sensors, and the control laws required for successful accomplishment of the missions. Propulsion addresses the engines which have been devised to convert chemical (and occasionally other forms) energy into useful work, to produce the thrust needed to propel aerospace vehicles. Structures addresses material properties, stresses, strains, deflection, and vibration along with manufacturing processes as required to produce the very light weight and rugged elements needed in aerospace vehicles. Aerospace "design" addresses the process of synthesizing vehicles and systems to meet defined missions and more general needs. This is a process that draws on information from the other subdisciplines while embodying its own unique elements.

Department Mission Statement

The mission of the Department of Aerospace Engineering is, (1) to provide the highest quality education in state-of-the-art aerospace engineering principles and practices at undergraduate and advanced degree levels and through continuing education programs for practicing engineers, (2) to

conduct research that will significantly advance the state of knowledge in the aerospace sciences and technologies, (3) to advance aerospace engineering practice and education through publications in the engineering and educational literature and through close relations with industry, government and other academia. (4) to contribute to the advancement of the School of Engineering, the University of Maryland, and the state of Maryland

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

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

Requirements for Major

Freshman Year	I	II
ENES 100—Introduction To Engr. Design	3	
ENAE 100—The Aerospace Engineering Profession	1	
CHEM 135—General Chemistry for Engineers		4
CORE	3	3
MATH 140, 141—Calculus I, II	4	4
PHYS 151—General Physics		3
ENES 102—Statics		3
ENAE 202—Computer Languages		2
Total	14	14
Sophomore Year	I	II
MATH 241—Calculus III	4	
ENAE 261—Aerospace Analysis & Computation	3	
ENES 220—Strength of Materials	3	
PHYS 262, 263—General Physics	4	4
CORE	3	3
MATH 246—Differential Equations		3
ENAE 283—Introduction to Aerospace Systems		3
ENES 221—Dynamics		3
Total	17	16
Junior Year	I	II
ENAE 311—Aerodynamics I	3	
ENME 232—Thermodynamics	3	
ENAE 301—Dynamics of Aerospace Systems	3	
ENAE 362—Aerospace Instrumentation & Experiments	3	
CORE	3	3
ENAE 324—Aerospace Structures		4
ENAE 432—Control of Aerospace Systems		3
ENGL 393—Technical Writing		3

AERO TRACK:

ENAE 414—Aerodynamics I3
OR

ASTRO TRACK:

ENAE 404—Space Flight Dynamics3
Total1516

Senior Year**I****II**

ENAE 423—Vibration and Aeroelasticity3
CORE3
ENAE 464—Aerospace Engr. Lab3
Aerospace Elective3
Technical Elective3

AERO TRACK:

ENAE 403—Aircraft Flight Dynamics3
ENAE 455—Aircraft Propulsion & Power3
ENAE 481—Principles of Aircraft Design3
ENAE 482—Aeronautical Systems Design3
OR

ASTRO TRACK:

ENAE 441—Space Navigation & Guidance3
ENAE 457—Space Propulsion & Power3
ENAE 483—Principles of Space Systems Design3
ENAE 484—Space Systems Design3
Total1515

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

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

Minimum Degree Credits: The fulfillment of all Department, School, and University requirements. Approximately 125 credits are required for an Aerospace Engineering degree.

Honors Program

The Aerospace Engineering Honors Program provides eligible students an opportunity to pursue an enriched program of studies which will increase the depth of their knowledge.

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

Admission

Admission requirements are the same as those of other Engineering Departments. See Clark School of Engineering entrance requirements.

Cooperative Education Program

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

Financial Assistance

The Department offers eight Glenn L. Martin merit-based scholarships and the Robert Rivello Scholarship. Space Systems Laboratory, Departmental and Alfred Gessow merit-based Scholarships are available as well. Students may obtain information in the main Aerospace Office.

Scholarships and Awards

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

American Institute of Aeronautics and Astronautics Outstanding Achievement Award for scholarship and service to the student chapter. Eligibility criteria are available in Department office.

Student Organizations

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

AFRO-AMERICAN STUDIES PROGRAM (AASP)

College of Behavioral and Social Sciences

2169 Lefrak Hall, (301) 405-1158

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

Acting Director: S. Harley

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

Assistant Professor: C. Woods

Instructor: 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

	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 Thesis	3

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 Affairs graduate admission requirements.

Eligibility

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

Contact: The Afro-American Studies Program at (301) 405-1158 for application and scholarship details.

Options for Study with AASP

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

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

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

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

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

Scholarships and Financial Aid:

John B. and Ida Slaughter Scholarship

Advising

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

Course Code: AASP

AGRICULTURAL SCIENCES, GENERAL (GNAS)

College of Agriculture and Natural Resources

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

Program Coordinator: D.S. Glenn dg11@uemail.umd.edu

82 Agricultural and Resource Economics

Curriculum in General Agricultural Sciences

Requirements for Major

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

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

AGRICULTURAL AND RESOURCE ECONOMICS (AREC)

College of Agriculture and Natural Resources

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

Professor and Chair: Gardner††

Professors: Bockstael, Chambers, Hardie, Hueth, Just††, Lichtenberg, Lopez, McConnell, Musser, Nerlove, Olson, Strand

Associate Professors: Hanson, Horowitz, Leathers, Lipton, McNew, Wade

Assistant Professors: Aggarwal, Alberini, Lynch, Melkanyan, Parker

Emeriti: Bender, Brown, Cain, 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 455—Economics of Land Use	3
AREC 484—Introduction to Econometrics in Agriculture	3
AREC 435—Commodity Futures and Options	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	1
Three other courses in animal sciences, natural resource sciences and landscape architecture, chosen from a list of selected courses.	

• Food Production

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

• Environmental and Resource Policy

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

• International Agriculture

ECON 305—Intermediate Macroeconomic Theory and Policy	3
ECON 315—Economics Development of Underdeveloped Areas	3
ECON 380—Comparative Economic Systems	3
ECON 340/441—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 Politics3
GVPT 170 – American Government3
Four other courses in government and politics, chosen from a list of selected courses.

• Advanced Degree Preparation

ECON 407—Advanced Macroeconomics3
ECON 414—Game Theory3
ECON 422—Quantitative Methods in Economics I3
ECON 423—Quantitative Methods in Economics II3
Two other courses in mathematics or mathematical economics, chosen from a list of selected courses.

• Student Designed Field

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

Course Code: AREC

AGRONOMY (AGRO)

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

AMERICAN STUDIES (AMST)

College of Arts and Humanities

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

Professor and Chair: Caughey

Professors: Kelly, Struna

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

1415A Animal Sciences Center, (301) 405-1373
E-mail: jd29@umail.umd.edu, re13@umail.umd.edu
<http://www.agnr.umd.edu/users/ansc>

Department of Animal and Avian Sciences

Professor and Chair: Erdman

Professors: Douglass, Harrell, Mather, Ottinger, Peters, Russek-Cohen, Soares, Varner, Vijay, Westhoff

Associate Professors: Barao, Dahl, Doerr, Hartsock, Majeskie, Porter, Stricklin, Zimmermann

Assistant Professors: Angel, Christian, Estevez, Kohn, Rankin, Woods

Emeriti: Flyger, Heath, Leffel, Mattick, Morris, Vandersall, Williams, Young

Adjunct Professors: Glenn, Howard, Paape

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 a specialization area: Animal Management and Industry, Avian Business, Laboratory Animal Management, and Sciences to prepare for admission to graduate, veterinary, or medical school. The Animal Sciences Center includes classrooms, lecture hall, social area, teaching labs, pilot processing plant, and animal rooms adjacent to a teaching farm where horses, sheep, swine, and cattle are maintained throughout the year.

Requirements for Major

Required of All Students

Semester Credit Hours

CORE Program Requirements*	40
ANSC 101—Principles of Animal Science	3
ANSC 211—Animal Anatomy	4
ANSC 212—Animal Physiology	3
ANSC 314—Comparative Animal Nutrition	3

84 Anthropology

BSCI 105—Principles of Biology I	4
BSCI 106—Principles of Biology II	4
BSCI 222—Introductory Genetics	4
CHEM 103—General Chemistry I	4
CHEM 104—Fundamentals of Organic and Biochemistry	4
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
BSCI 223—General Microbiology	4
*Includes 16 required credits listed below	

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

Combined Degree Curriculum: Animal Sciences/ Veterinary Medicine

Colleges of Agriculture and Veterinary Medicine

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

Combined Degree Requirements

CORE Program requirements*	40
ANSC 220—Livestock Management	4
ANSC 315—Applied Animal Nutrition	3
BSCI 105—Principles of Biology I	4
BSCI 106—Principles of Biology II	4
BSCI 222—Principles of Genetics	4
Mathematics (must include 3 credits of calculus)	6
CHEM 103—General Chemistry I	4
CHEM 113—General Chemistry II	4
CHEM 233—Organic Chemistry I	4
CHEM 243—Organic Chemistry II	4
PHYS 121—Fundamentals of Physics I	4
PHYS 122—Fundamentals of Physics II	4
Biochemistry	3
Electives	9
*Includes 11 required credits listed above	

For additional information, please contact the Associate Dean, VMRCVM, 1203 Gudelsky Veterinary Center, University of Maryland, College Park, MD 20742, (301) 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
Associate Professors: Shackel
Assistant Professors: Freidenberg, Paolisso, Stuart
Lecturers: Earnstein, Hall, London
Research Associate: Neuwirth
Faculty Research Assistants: Blades, Larsen, Maloney, Reeves, Reisinger, Reyes
Affiliate Faculty: Bolles (WMST), Caughey (AMST), Harrison (CMLT), Kim (WMST), Robertson (MUSC)
Adjunct Faculty: Crain (Adjunct Professor, LTG Associates), McManamon (Adjunct Professor, National Park Service), Potter (Adjunct Professor, National Park Service), Puentes-Markides (Adjunct Professor, PAHO/WHO), Tashima (Adjunct Professor, LTG Associates)

The Major

Anthropology, the 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 the disciplined scholarship of the cultural development of human beings' knowledge and customary behavior.

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

Academic Programs and Departmental Facilities

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

The undergraduate curriculum is 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.

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

Requirements for Major

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

Required Courses:

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

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

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

Quantitative Methods or Foreign Language Requirement:

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

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

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

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

Advising

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

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 AND SCIENTIFIC COMPUTATION PROGRAM

College of Computer, Mathematical and Physical Sciences

3301 A.V. Williams Building, (301) 405-1714
<http://www.amsc.umd.edu>

Director: Levermore

Faculty: More than 100 members from 13 units.

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

Course Code: AMSC

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: Sham

Graduate Director: Craig

Professor Emerita: Truitt†

Professor Emeritus: Driskell††

Professors: DeMonte†, Fabiano, Lapinski, Pogue

Associate Professors: Craig, Forbes, Gelman, Humphrey, Kehoe, Klank,

Lozner, McCarty, Richardson, Ruppert, Sham, Thorpe

Assistant Professor: Morse

Instructor: Jacobs

Part Time: Tacha

†Distinguished Scholar-Teacher

††Distinguished University Professor

The Major

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

86 Art History and Archaeology

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

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

Requirements for Major

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

Citation in Interdisciplinary Multimedia and Technology

16 credit hours. ARTT 354, ENGL 479, ARTT 689B, and three courses from approved list of courses. Students who fulfill Citation requirements will receive a Citation on the official transcript. Please contact the Director of Undergraduate Studies for more information.

Advising

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

Honors Program

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

Fieldwork and Internship Opportunities

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

Scholarships and Awards

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

Student Art Exhibitions

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

Lecture Program

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

Course Code: ARTT

ART HISTORY AND ARCHAEOLOGY (ARTH)

College of Arts and Humanities

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

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

Chair: Hargrove

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

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

Assistant Professors: Kita, Kornbluth

The Major

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

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

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

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

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

Requirements for the major in Art History are as follows: three ARTH courses (9 credits) at the 200 level; seven ARTH courses (21 credits) at the 300-400 level; either ARTT 100 or ARTT 110 (3 credits); a supporting area of four courses (12 credits) in coherently related subject matter outside the department of Art History and Archaeology at the 300-400 level. No credit toward the major can be received for ARTH 100 or 355. No course with a grade lower than C may be used to satisfy major or supporting area requirements.

Citation in Archaeology

15 credit hours. ARTH 484 and four courses approved list of courses. Students who fulfill Citation requirements will receive a Citation on the official transcript. Please contact the Director of Undergraduate Studies for more information.

Advising

Departmental advising is mandatory for all majors.

Honors Program

Qualified majors may participate in the department's honors program, which requires the completion of ARTH 496 (Methods of Art History) and ARTH 497 (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 Levitt and Frank DiFederico Book Awards to seniors nearing graduation.

Course Code: ARTH

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

College of Arts and Humanities

2106 Jimenez Hall, (301) 405-4239

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

Associate Professor and Acting Chair: Martin

Professors: Brecht, Ramsey

Adjunct Professor: Li

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

Assistant Professors: Branner, Fradkin, Jones, Liu, Yotsukura

Instructors: Levy, Miura, Sano, Shen, Yaginuma

Lecturers: Lee, Papazian

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

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

Chinese Language and Literature

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

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

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

Chinese Course Requirements

Language:

CHIN 201—Intermediate Spoken Chinese I (3)

CHIN 202—Intermediate Written Chinese I (3)

CHIN 203—Intermediate Spoken Chinese II (3)

CHIN 204—Intermediate Written Chinese II (3)

CHIN 301—Advanced Chinese I (3)

CHIN 302—Advanced Chinese II (3)

Civilization/History:

Option I:

HIST 284—East Asian Civilization I (3)

and

HIST 481—A History of Modern China (3)

or

HIST 485—History of Chinese Communism (3)

Option II:

HIST 285—East Asian Civilization II (3)

and

HIST 480—History of Traditional China (3)

Electives (300-level or above; 12 credits)

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

Business Option

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

Citations

Citation in Chinese Language

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

Citation in Chinese Studies

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

Citation in Business Management for Chinese Majors (1107B)

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

Citation in Business Chinese

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

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

Japanese Language and Literature

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

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

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

Japanese Course Requirements

Language:

JAPN 201—Intermediate Japanese I (6)

JAPN 202—Intermediate Japanese II (6)

JAPN 301—Advanced Japanese I (6)

JAPN 302—Advanced Japanese II (6)

88 Asian and East European Languages and Cultures

Civilization/History:

Option I:

HIST 284—East Asian Civilization I (3)

and

HIST 483—History of Japan Since 1800 (3)

Option II:

HIST 285—East Asian Civilization II (3)

and

HIST 482—History of Japan to 1800 (3)

Electives (300-level or above; 12 credits)

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

Supporting Courses for Chinese or Japanese

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

Business Option

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

Citations

Citation in Business Management for Japanese Majors (1108B)

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

Citation in Business Japanese

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

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

Russian Language and Literature

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

Russian Course Requirements

Eight Courses (24 credits) from the following:

RUSS 210—Structural Description of Russian (3)

RUSS 211—Applied Russian Phonetics (3)

RUSS 301—Advanced Russian I (3)

RUSS 302—Advanced Russian II (3)

RUSS 303—Russian Conversation: Functional Skills (3)

RUSS 307—Commercial Russian I (3)

RUSS 321—Survey of Russian Literature I (3)

RUSS 322—Survey of Russian Literature II (3)

RUSS 401—Advanced Russian Composition (3)

RUSS 402—Practicum in Written Russian (3)

RUSS 403—Russian Conversation: Advanced Skills (3)

RUSS 404—Practicum in Spoken Russian (3)

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

RUSS 407-Commercial Russian II (3)

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

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

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

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

RUSS 434—Soviet Russian Literature (3)

RUSS 439—Selected Topics in Russian Literature (3)

Supporting Courses

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

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

Business Option

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

303, 403, 467) in the Summer Programs in the Plekhanov Institute in Moscow or the Moscow Institute of Finance.

Citations

Citation in Russian Language

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

Citation in Russian Language and Culture

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

Citation in Business Management for Russian Majors (1106B)

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

Citation in Business Russian

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

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

Arabic Language

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

Hebrew Language

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

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

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

Korean

The Korean language program consists of two tracks. The first consists of KORA 101 and KORA 102 and is designed for students with no previous background in, or exposure to, Korean language and culture. The second track consists of KORA 211 and KORA 212. It is a heritage sequence for students who were exposed to Korean as children, but who do not have

native fluency in the language. Students who wish to enroll in either track will need to be placed by the instructor. In addition to these four language skill courses, the department offers KORA 242, an introductory course on the structure of the Korean language, and KORA 241, a survey of the history of the Korean language.

Citation in Korean Studies

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

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

ASTRONOMY DEPARTMENT (ASTR)

College of Computer, Mathematical, and Physical Sciences

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

E-mail: astrgrad@deans.umd.edu

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

Chair: Leventhal

Associate Director: Trasco

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

Professor Emeriti: Bell, Erickson, Wentzel

Associate Professors: Harris, Stone

Assistant Professors: Hamilton, McGaugh, Miller, Ostriker, Richardson, Veilleux

Instructors: Deming, Theison

Adjunct Professors: Holt

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

Assistant Research Scientists: Golla, Hewagama, Lisse, Loewenstein, Madjeski, Wolfire

Senior Research Scientists: Goodrich, Sharma

The Major

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

Requirements for Major

Astronomy majors are required to take a two-semester introductory astronomy sequence: ASTR 120-121, an observing course ASTR 310 and an introductory astrophysics course ASTR 320. Two additional 400-level astronomy 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 advisor, PHYS 161, 262, 263 and 174 can be substituted for this sequence. PHYS 374 and two additional 400-level Physics courses are required. Astronomy majors are also required to take a series of supporting courses in Mathematics. These are MATH 140, 141, 240, 241 and 246.

The program requires that a grade of C or better be obtained in all courses required for the major. 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 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 covered (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 student of exceptional ability and interest in Astronomy opportunities for part-time research participation which may develop into full-time summer projects. Honors students work with a faculty advisor on a research project for which academic credit may be earned. Certain graduate courses are open for credit toward the bachelor's degree. (Students are accepted into the Honors Program by the Department's Honors Committee on the basis of grade point average or recommendation of faculty.) Honors candidates submit a written proposal on their research project and enroll in ASTR 399 for at least 3 credits. In their senior year, students complete a research project, write a thesis and do an oral presentation before a committee. Satisfactory grades lead to graduation "with honors (or high honors) in Astronomy."

For Additional Information

Further information about advising and the Honor Program can be obtained by calling the Department of Astronomy office on (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 ts167@umail.umd.edu

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

Chair: Wheaton

Professors: Johnson, Shirmohammadi, Wheaton

Associate Professors: Kangas, Ross

Assistant Professors: Baldwin, Becker, Felton, Montas, Schreuders

Emeriti: Brodie, Grant, Harris, Krewatch, Merrick, Stewart

The Major

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

90 Biological Resources Engineering

Requirements for Major

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

Bioenvironmental and Ecosystem Engineering

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

Biomedical Engineering

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

Biotechnological Engineering

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

Pre-medicine/Pre-veterinary

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

Educational Objectives

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

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

Biological Resources Engineering Curriculum

Freshman Year

ENES 100—Introduction to Engineering Design	3
*MATH 140—Calculus I	4
*CHEM 103—General Chemistry I	4
*BSCI 105—Principles of Biology I	4
ENBE 110—Intro. to Bio. Res. Engineering	1
Total	16

ENES 102—Statics	3
*MATH 141—Calculus II	4
*CHEM 113—General Chemistry II	4
*PHYS 161—General Physics	4
ENGL 101—Introduction to Writing	3
Total	18

Sophomore Year

CHEM 233—Organic Chemistry	4
BSCI 223—General Microbiology	4
ENES 220—Mechanics of Materials	3
*PHYS 262—General 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
BSCI 230—Cell Biology and Physiology	4
*CORE1	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	
[MATH 241: Calculus III]	4
*CORE1	3
Total	16

ECON 201—Principles of Economics	3
or (approved substitute)	
ENBE 454—Biological Process Engineering	4
[BIOL SCI: Technical Elective]3	3
[ENGR SCI: Technical Elective]3	3
*CORE1	3
Total	16

Senior Year

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

ENBE 482—Dynamics of Biological Systems	1
ENBE 484—Biological Responses to Environmental Stimuli	3
ENBE 486—Capstone Design II	2
[ENGR SCI: Technical Elective]3	6
*CORE1	3
Total	15
Total	128

*Satisfies General Education Requirements

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

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

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

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

Engineering Sciences (ENGR SCI) technical electives may be chosen, also depending on students' interests, from among the following programs: Aerospace Engineering, Biological Resources Engineering, Civil Engineering, Chemical Engineering, Electrical Engineering, Fire Protection Engineering, Mechanical Engineering, and 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 advisors 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 students are recognized each year for scholastic achievement and for their contribution to the department, college, and university. Top students are selected for Alpha Epsilon, the Honor Society of Biological Resources Engineering, and Tau Beta Pi, the engineering honor society.

Student Organization

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

Course Code: ENBE

BIOLOGICAL SCIENCES PROGRAM

College of Life Sciences

1302 Symons Hall, (301) 405-6892

Director: Barbara Thorne

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 (Zool)
Cell and Molecular Biology and Genetics (CMBG)
Physiology and Neurobiology (PHNB)
Marine Biology (MARB)
Behavior, Ecology, Evolution & Systematics (BEES)
General Biology (GENB)
Individualized Studies (BIVS)

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

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

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

Advising

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

Smith	1219 H.J. Patterson	(301) 405-1597	CMBG, MICB PLNT GENB
Compton	2227 Bio.Psych. Bldg.	(301) 405-6904	ZOOL, PHNB, MARB, BEES
Kent	3142 Plant Sciences Bldg.	(301) 405-3911	ENTM, GENB
Presson	1326A Symons Hall	(301) 405-6892	BIVS

Honors

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

Course Code: BSCI

92 Business and Management, General

BIOLOGY (BIOL)

College of Life Sciences

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

E-mail: biolugrad@umail.umd.edu

Professor and Chair: Jeffery

Associate Chair: Infantino

Professors: Borgia, Carr, Carter-Porges, Colombini, Gill, Palmer, Popper, Reaka-Kudla, Sebens, Via, Wilkinson

Associate Professors: Cohen, Dietz, Dudash, Fenster, Forseth, Goode, Higgins, Imberski, Inouye, Payne, Racusen, Shaw, Small

Assistant Professors: Davenport, Hare, Quinlan, Sukharev, Tishkoff

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

Jointly Appointed Faculty: Costanza, Mount, Poeppel

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

Director of Graduate Studies: Forseth

Director of Undergraduate Studies: Compton

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

Requirements for Specialization

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

Advising

Advising in the Biological Sciences program is mandatory. Students are assigned an advisor based on their area of specialization. The Department of Biology faculty coordinate and advise students who specialize in Physiology and Neurobiology (PHNB), Marine Biology (MARB), Zoology (ZOOL), 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.

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, Gantttt, Joseph, Mosser, Simon, Sze, Weiner, Wolniak, Yuan

Associate Professors: Benson, Bottino, Destefano, Hutcheson, Mount, Stein, Stewart, Straney

Assistant Professors: Chang, deQuevas, Delwiche, Di Ruggiero, Liu, Pontzer, Song

Instructors: Smith

Lecturer: Caines, Shields

Professors Emeriti: Collwell, Cook, Diener††, Doetsch, Hetrick†, Patterson, Pelczar, Reveal, Roberson

Adjunct Associate Professor: Culver

Adjunct Assistant Professors: Baehrecke

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: Barbari

Associate Chair and Undergraduate Director: Wang

Director of Graduate Studies: Gentry

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

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

Assistant Professors: Adomaitis, Ehrman, Pulliam-Holoman

Emeriti: Beckmann, Gomezplata, Sengers, Smith

**Adjunct

The Major

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

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

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

Requirements for Major

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

	Semester	
	I	II
Freshman Year		
ENES 100—Intro to Engineering Design	3	
ENES 102—Statics		3
MATH 140—Calculus I	4	
MATH 141—Calculus II		4
CHEM 135, 136—General Chemistry for Engineers	3	1
ENGL 101—Introduction to Writing	3	
PHYS 161—General Physics I	3	3
Core Program Requirements		6
Total Credits	13	17

Sophomore Year

MATH 241—Calculus III	4	
MATH 246—Differential Equations for Scientists & Engineers		3
PHYS 262, 263—General Physics	4	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	17

Junior Year

ENCH 300—Chemical Process Thermodynamics	3	
ENCH 333—Seminar		1
ENCH 440—Chemical Engineering Kinetics		3
ENCH 442—Chemical Engr. Systems Analysis	3	
CHEM 481, 482—Physical Chemistry I, II	3	3
CHEM 483—Physical Chemistry Lab I	2	
ENCH 422—Transport Processes I	3	
ENCH 424—Transport Processes II		3
CORE Program Requirements	6	3
Total Credits	17	16

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 426—Transport Processes III	3	
Technical Electives*	3	6
Advanced Chemistry Elective*	4	
CORE Program Requirements		6
Total Credits	15	15

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

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

Technical Electives Guidelines

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

Additional guidelines are as follows:

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

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

Technical Electives

Biochemical Engineering

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

Polymer Engineering

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)

Systems Engineering

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.

94 Chemistry and Biochemistry

Co-op Program

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

Financial Assistance

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

Honors and Awards

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

Student Organizations

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

Course Code: ENCH

CHEMISTRY AND BIOCHEMISTRY (CHEM, BCHM)

College of Life Sciences

0107H Chemistry Building, (301) 405-1788

Student Information: 0107 Chemistry Building, (301) 405-1791

Professor and Chair: DeShong

Associate Chairs: Ammon, Blough

Academic Programs Coordinator: Berkowitz

Director, Undergraduate Programs: Vacant

Professors: Alexander, Ammon, Blough, DeShong†, Fenselau, Grim, Hansen, Helz, Jarvis†, Khanna, Lorimer, Mazzocchi, Mignerey†, Miller, Moore, Munn, Thirumalai, Tossell, Walters, Weekst†, Weiner

Associate Professors: Boyd, DeVoe, Eichhorn, Falvey, Hu, Julin, Lee, Murphy, Ondov, Reutt-Robey, Rokita, Sita

Assistant Professors: Arias, Davis, Evans, Isaacs, Jollie, Kahn, Morehead, Walker

Instructors: Bond, Ebrahimian, Rebbert

Emeriti: Bellama, Freeman, Henery-Logan, Holmlund, Huheey, Jaquith, Kasler, McNesby, Munn, O'Haver, Pratt, Sampugna, Stewart, Stuntz, †Distinguished Scholar-Teacher

††Distinguished University Professor

Adjunct Professors: Kearney, Mazzola

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, 153/227 (CHEM 153 and CHEM 227 are corequisites). Students who transfer into the chemistry or biochemistry programs and do not have the equivalent of CHEM 143-153/227 must take a three-semester sequence: CHEM 103-113-227. Additional courses common to both biochemistry and chemistry majors are the two-semester sequence in organic chemistry (CHEM 237-247), the one-credit seminar in professional issues (CHEM 395), the instrumental analysis course (CHEM 425), the two-semester lecture sequence in physical chemistry (CHEM 481-482) the first semester (CHEM 483) of the physical chemistry laboratory sequence, and EDCP 108-0.

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

Requirements for Chemistry Majors

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

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

	Semester Credit Hours
University CORE Requirements	30
College of Life Sciences Core Requirements	5*
Departmental Requirements	43
Supporting Courses	16
Electives	26
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 BSCI 105 (4), biochemistry majors must take two additional approved biological science courses; certain specific courses, as explained by the undergraduate office.

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

	Semester Credit Hours
University CORE Requirements	30
College of Life Sciences Core Requirements	5*
Departmental Requirements	46
Supporting Courses	16
Electives	23
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 0107 Chemistry Building, (301) 405-1791.

Financial Assistance

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

Honors and Awards

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

Student Organizations

Alpha Chi Sigma Chemistry Fraternity is a professional fraternity which recruits men and women students from chemistry, biochemistry, and related science majors during each fall and spring semester. The fraternity

holds weekly meetings and provides tutoring for students in lower-level chemistry courses. The office is in Room 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, G. Chang, Davis, Donaldson, Hao, McCuen, Schelling, Schonfeld, Sternberg, Vannoy

Associate Professors: Austin, P. Chang, Goodings, Goulias, Haghani, Schwartz, Torrents

Assistant Professors: Aydilek, Brubaker, Gabriel, Lovell, Moglen, Seagren, Sermons, Tseng

Professor Emeritus: Birkner, Carter, Colville, Ragan

The Major

Civil and Environmental Engineering is a people-serving profession, concerned with the planning, design, construction and operation of large complex systems such as buildings and bridges, water purification and distribution systems, highways, rapid transit and rail systems, ports and harbors, airports, tunnels and underground construction, dams, power-generating systems, and structural components of aircraft and ships. Civil and environmental engineering also includes urban and city planning, water and land pollution and treatment problems, and disposal of hazardous wastes and chemicals. The design and construction of these systems are only part of the many challenges and opportunities for civil and environmental engineers. The 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: engineering management, environmental engineering, geotechnical engineering, structural engineering, transportation engineering, and water resources and remote sensing. A total of 122 credit hours is required for a bachelor of science (B.S.) degree with emphasis in basic science (mathematics, chemistry, and physics), engineering science (mechanics of materials, statics, and dynamics), basic civil and environmental engineering core courses; and 18 credits of technical electives that may be selected from a

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

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

Program Outcomes

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

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

Technical competence is measured by the ability to apply knowledge and fundamental principles to the solution of problems in each area noted. The students' perceptions of their abilities and growth in the above areas, and their opinions of the effectiveness of the program in meeting the program

96 Classics

objectives, will be surveyed each semester and compared to faculty assessments to provide a solid basis for determining the actions needed to enhance the program and improve the quality and abilities of all graduates.

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

Sophomore Year

MATH 241—Calculus III	4	
MATH 246—Differential Equations for Scientists and Engineers	3	
PHYS 262, 263—General Physics II, II.....	4	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	3
Total	17	16

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		
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	15

Senior Year

ENCE Technical Electives (Group A, B, C, D, E, F, G, and H)* ...	9	9
ENCE 320—Thermodynamics	3	
ENCE 466—Design of Civil Engineering Systems	3	
CORE Program Requirements	3	
Total	15	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, 1182 Engineering Classroom Building.

Fieldwork and Internship Opportunities

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

Financial Assistance

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

Honors and Awards

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

Student Organizations

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

Course Code: ENCE

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)

Associate Professors: Doherty, Lee, Staley, Stehle

Assistant Professor: Dietrich, Rutledge

†Distinguished Scholar-Teacher

The Major

Classics is the study of the languages, literature, culture and thought of ancient Greece and Rome. Students at the University of Maryland may major in Classical Languages and Literatures with four options and may enroll in a variety of courses on the classical world. These options include Latin, Greek, Greek and Latin, and Classical Humanities.

Advising

Departmental advising is mandatory for all majors every semester.

Requirements for Major

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

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

Option A: Latin

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

Option B: Greek

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

Option C: Latin and Greek

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

Option D: Classics in Translation (Classical Humanities)

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

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

Citations

Citations in Ancient Greek Language and Literature

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

Citation in Classical Language and Mythology

15-16 credit hours. CLAS 170, 470, and three courses from approved list of courses.

Citation in Latin Language and Literature

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

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

Course Codes: CLAS, GREK, LATN

COMMUNICATION (COMM) (FORMERLY SPEECH COMMUNICATION)

College of Arts and Humanities

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

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

Professor and Chair: Fink[†]

Professors: J. Grunig, Wolvin

Associate Professors: D. Cai, Gaines, L. Grunig, Klumpp, McCaleb, Tom

Assistant Professors: Aldoory, Drake, Garst, McComas, Meffert,

S. Parry-Giles, T. Parry-Giles

Director of Undergraduate Studies and Lecturer: Waks

Outreach Coordinator and Lecturer: Johnson

Lecturers: Altschul, J. Cai, Cuffman, Eadie, Elson, Frederick, Niles

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

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

Visting Professor: Kendall

Visiting Associate Professor: Pavitt

[†]Distinguished Scholar-Teacher

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

Admission to the Major

First-time Freshman

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

- Complete 50% of the CORE requirements, including Fundamental Studies requirements in Mathematics and English.
- Complete one of the following courses with a grade of C or better: BMGT 230; CCJS 200; PSYCH 200; SOCY 201, or equivalent
- Complete COMM 107, COMM 200, or COMM 230 with a grade of C or better
- Complete COMM 250 with a grade of C or better and
- A GPA of 2.0 or better

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

Transfer Students

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

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

Appeals

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

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

The Major

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

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

98 Community Health

Requirements for Major

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

1. One course from the following list: COMM 107, 200, or 230.
2. COMM 250, 400, and 401.
3. Completion of one of the following tracks: Communication Research, Communication Studies, Public Relations, or Rhetoric and Public Discourse.
 - a. Communication Research COMM 402
Five courses from the following: COMM 420, 424, 425, 426,

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

COMPARATIVE LITERATURE PROGRAM (CMLT)

College of Arts and Humanities

2107 Susquehanna Hall, 405-2853

Core Faculty

Professor and Director: Harrison* (Spanish and Portuguese)
 Professors: Berlin* (English and Jewish Studies), Collins* (English), Fuegi, Lanser†* (English), Lifton, Peterson* (English)
 Associate Professor: Wang* (English)
 Instructor: Robinson
 Visiting Assistant Professor: Conroy* (American Studies)
 *Joint appointment with unit indicated
 †Distinguished Scholar-Teacher

Affiliate Faculty

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

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

The Major

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

Citation in Comparative Studies

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

Course Code: CMLT

COMPUTER ENGINEERING (ENCP)

A. James Clark School of Engineering

Department of Electrical and Computer Engineering

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

E-mail: eeadvise@deans.umd.edu

www.ece.umd.edu

Acting Chair: Marcus

Professors: Agrawala, Aloimonos, Davis, Declaris, Elman, Gasarch, Gligor, Ja'Ja', Miller, Nakajima, Nau, O'Leary, Oruc, Perlis, Reggia, Rosenfield, Roussopoulos, Saltz, Samet, Shankar, Shneiderman, Smith, Stewart, Tripathi, Vishkin, Zerkowit

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

Assistant Professors: Arbaush, Barua, Benderson, Bhattacharyya, Bhattacharjee, Chawathe, M. J. Franklin, M. Franklin, Golubchik, Holingsworth, Jacob, Keleher, Salem, Tseng, Qu, Yeung, Varsheny

Lecturers: Golub, Herman, Kaye, Lin, Plane, Postow, Maybury, Hugue, Padua-Perez, Scholnik, Maheshwari

Emeriti: Chy, Edmonson, Koppel, Lianopoulos, Michael, Ressler

The Major

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

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

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

Requirements for Major

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

As in all engineering degrees, the student starts out with a core curriculum

100 Computer Engineering

Sophomore Year

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

Junior Year

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

Senior Year

CORE—General Education	3	6
Electives	14	10
Total Credits	17	16

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

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

Computer Engineering Majors

New Technical Elective Requirements*

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

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

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

1. Two credits of ENEE 499, Senior Projects in Electrical and Computer Engineering, may be used to satisfy the Advanced Laboratory requirement subject to approval by the faculty supervisor and the Associate Chair. The maximum number of ENEE 499 credits that may be applied towards EE technical elective requirements is five.
2. Additional Capstone Design courses can be used as substitutes for the required Electrical Engineering Theory and Applications course; and/or the required Advanced Laboratory course, provided one of the following is completed: ENEE 408A, 408B, 408C, or 408F.
3. Completion of ENEE 408A and ENEE 459A satisfies both the Capstone Design and Advanced Laboratory requirements.
4. Consistent with the new capstone design requirements announced in March 2000, a student may use a course from a previously published capstone design list to satisfy the Category E requirement, provided that course is completed by Fall 2000. In such case, that course may not be used to satisfy any other requirement.
5. There is no longer a requirement that students complete a total of seven design credits, hence there is no need to consult the list of design credits for each course.

6. If you have any questions on how these requirements affect your current selection of technical electives, please contact an advisor.

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

Admission

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

Advising

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

Cooperative Education Program

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

Financial Assistance

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

Job Opportunities

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

Research Labs

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

Student Organizations

Please see listing for ENEE

Courses (see full descriptions in chapter 8)

CMSC 114—Computer Science I (4)
CMSC 214—Computer Science II (4)
CMSC 250—Discrete Structures (4)
CMSC 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—Digital Electronics (3)
ENEE 322—Signal and System Theory (3)
ENEE 324—Engineering Probability (3)
ENEE 350—Computer Organization (3)
ENEE 446—Digital Computer Design (3)

Course Codes: ENEE, CMSC

COMPUTER SCIENCE (CMSC)

College of Computer, Mathematical and Physical Sciences

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

E-mail: ugrad@cs.umd.edu

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

Professor and Chair: Davis

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

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

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

Instructor: Plane

Lecturers: Glenn, Golub, Herman, Hugue, Kaye, Lina, Maybury, Moheshwari, Postow, Soolnik

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

The Major

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

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

Requirements for Computer Science Major

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

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

1. A grade of C or better in each of the following courses:
 - a. CMSC 106 or acceptable score on the appropriate Department exemption examination.
 - b. CMSC 114 or acceptable score on the C++ Advanced Placement examination or acceptable score on the appropriate Department exemption examination.
 - c. CMSC 214 or acceptable score on the appropriate Department exemption examination.
 - d. CMSC 250 or acceptable score on the appropriate Department exemption examination.
 - e. CMSC251
 - f. At least 24 credit hours at the 300-400 levels. These must include CMSC 311, CMSC 330, and at least 15 credit hours of the following CMSC courses:
 - Computer Systems: Up to two of 411, 412, 414, 417
 - Information Processing: 420, one of 421 or 424 or 426 or 427;
 - Software Engineering/Programming Languages: Up to two of 430, 433, 434, 435;
 - Algorithms and Computation Theory: 451, 452, 456;
 - Numerical Analysis: One of 460 or 466, 467.

Note: Courses in Numerical Analysis require MATH 240 and 241 as additional prerequisites. Students without either of these prerequisites must choose their 15 credit hours from the remaining courses in the other three areas.

2. MATH 140 and 141 (or MATH 350, 351). A STAT course which has MATH 141 (or a more advanced mathematics course) as a prerequisite, and one other MATH, STAT, or AMSC course which has MATH 141 (or a more advanced mathematics course) as a prerequisite. A grade of C or better must be earned in each of the courses. No course that is cross-listed as CMSC may be counted in this requirement.

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

Advising

Computer science majors may obtain advising at room 1119 A.V. Williams Building. Interested students should call (301) 405-2672 to receive further information about the program.

Financial Assistance

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

Honors

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

Student Organizations

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

Course Code: CMSC

COUNSELING AND PERSONNEL SERVICES (EDCP)

College of Education

3214 Benjamin Building, (301) 405-2858

Professor and Chair: Power

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

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

Assistant Professors: Bagwell (Affiliate), Freeman (Affiliate), Gast (Affiliate), Holcomb-McCoy, Kandell (Affiliate), Lucas, Mielke (Affiliate), Osteen (Affiliate), Phillips, 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, 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

102 Criminology and Criminal Justice

CRIMINOLOGY AND CRIMINAL JUSTICE (CCJS)

College of Behavioral and Social Sciences

2220 LeFrak Hall, (301) 405-4699

Chair: Wellford

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

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

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

Lecturers: Carr, Cosper, Gaston, Goode, 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:

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

The Criminology and Criminal Justice Major

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

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

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

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

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

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

Internships

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

Honors

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

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

Advising

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

Course Code: CCJS

CURRICULUM AND INSTRUCTION (EDCI)

College of Education

2311 Benjamin Building, (301) 405-3324

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

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

Assistant Professors: Chambliss, Cooper* (Mathematics), Cozart, Ivey
Emeriti: Amershek, Blough, De Lorenzo, Duffey, Eley, Folstrom, Heidelberg, Henkelman, Layman, Lockard, Roderick, Schindler, Stant, Weaver, Wilson,

*Joint appointment with unit indicated

The Major

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

1. Elementary Education: for the preparation of teachers of grades 1-6 and middle school, and
2. Secondary Education: for the preparation of teachers in various subject areas for teaching in middle schools and secondary schools, grades 5-12 (foreign language only, grades 7-12).

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

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

The **Citation Option**, which is intended for sophomores and juniors in a content major, permits potential teacher candidates to enroll in a sequence of education courses that helps them to determine if teaching is a viable career option for them. The twelve to eighteen credit citation option may be taken prior to admission into a teacher preparation program. A selected twelve credits also may count toward the certificate in secondary education or the dual major for those students who elect to pursue teacher certification in secondary education.

The **Certificate Program**, which is designed for sophomores, juniors, and seniors in a content major, requires a major and Bachelor's degree in an academic content area, plus the completion of a certificate program for secondary education. Selected course work from the citation option may be taken prior to admission into the certificate option with up to twelve credits counting towards the certificate in secondary education. The certificate program leads to state approved certification as a secondary teacher in a content area.

The **BS/MS Fast Track Certification Program**, which is intended for content majors entering the junior or senior year, is for talented students with a minimum GPA of 3.0 who enroll in a Bachelor's degree program in a content area and elect to continue in a Master's level program leading to certification in secondary education. Nine credits of the program may count for both the Bachelor's and Master's degrees. Prior approval is required for students electing this option. This program can be completed in two semesters following the completion of the Bachelor's degree.

Detailed information about these secondary education program options is available through the Department of Curriculum and Instruction, Room 2311 Benjamin (301/405-3324).

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

Requirements for Major Including Program Options

All Teacher Education Programs have designated pre-professional courses and a specified sequence of professional courses. Before students may enroll in courses identified as part of the professional sequence, they must complete the selective admission requirements and be fully admitted to the College of Education's Teacher Education Program.

Admission

Admission to the Teacher Education Professional Program is competitive. Admission procedures and criteria are explained in "Entrance Requirements" in the College of Education entry in Chapter 6.

Advising

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

ELEMENTARY EDUCATION (Grades 1-6 and Middle School)

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

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

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

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

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

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

Other Pre-Professional Requirements:

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

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

Professional Education Courses:

Professional Semester 1

EDCI 397—Principles and Methods of Teaching in Elementary Schools (3)

EDCI 385—Computers for Teachers (3)

EDCI 461—Materials for Creating Skilled and Motivated Readers (K-6) (3)

(Students typically take EDHD 425 and EDHD 411 as part of Professional Semester 1.)

Professional Semester 2

EDCI 322—Curriculum and Instruction in Elementary Ed.: Social Studies (3)

EDCI 342—Curriculum and Instruction in Elementary Ed.: Language Arts (3)

EDCI 352—Curriculum and Instruction in Elementary Ed.: Mathematics (3)

EDCI 362—Curriculum and Instruction in Elementary Ed.: Reading (3)

EDCI 372—Curriculum and Instruction in Elementary Ed.: Science (3)

Professional Semester 3

EDCI 481—Student Teaching: Elementary (12) – 16 weeks

EDCI 464—Reading Instruction and Diagnosis across Content Areas (3)

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

SECONDARY EDUCATION PROGRAMS

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

Foreign-Language Requirement, Bachelor of Arts Degree

Language proficiency may be demonstrated in one of several ways:

- (a) Successful completion of level 4 in one language or level 2 in each of two languages in high school. Students must provide a high school transcript to verify exemption.
- (b) Successful completion of an intermediate-level college foreign language course designated by the department.
- (c) Successful completion of a language placement examination in one of the campus language departments offering such examinations.

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

Art Education (Grades K-12)

The Art Education curriculum is designed to prepare students to teach art in elementary and secondary schools. It provides prospective art teachers with a knowledge base about the theories and best practices relevant to effective pedagogy, as well as current education and art education goals and standards. Students have the option of pursuing either the Bachelor of Arts or the Bachelor of Science degree.

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

Pre-Professional/Subject Area Courses

Note: Course Sequencing is under review.

ARTT 150—Introduction to Art Theory (3)

ARTT 100—Two Dimensional Art Fundamentals (3)

ARTT 110—Elements of Drawing I (3)

ARTH 200—Art of the Western World to 1300 (3)

ARTH 201—Art of the Western World after 1300 (3)

104 Curriculum and Instruction

ARTT 200—Three-Dimensional Art Fundamentals (3)
ARTT 210—Elements of Drawing II (3)
ARTT 320—Elements of Painting (3)
EDCI 273—Practicum in Ceramics (3) (Spring only)
ARTT 428—Painting (3)
EDCI 406—Computers, Art, and Chaos Theory (3) (Fall only)
EDCI 407—Practicum in Art Education: Three Dimensional (3) (Spring only)
ARTT 340—ARTT 341, ARTT 342, ARTT 343, ARTT 344—Elements of Printmaking: Intaglio (3)

Pre-Professional/Education Courses

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

Mathematics Education (Grades 5-12)

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

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

Pre-Professional/Education Courses

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

Professional Education Courses

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

Music Education (Grades K-12)

The curriculum in music 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.

NOTE: The administration of the music education program has shifted to the School of Music within the College of Arts and Humanities.

Instrumental

Pre-Professional/Subject Area Courses

MUSP 109, 110—Music Performance (Principal Instrument) (2,2)
MUSC 150, 151—Theory of Music I, II (3, 3)
MUSC 102, 103—Class Piano I, II (2, 2)
MUSC 116, 117—Class Study: Clarinet (2); Class Study: Flute, Oboe, Bassoon, and Saxophone (2)
MUED 197—Pre-Professional Experiences (1)
MUSP 207, 208—Music Performance (Principal Instrument) (2, 2)
MUSC 250, 251—Advanced Theory of Music I, II (4, 4)
MUSC 113, 121—Class Study: Violin (2); Class Study: Horn, Trombone, Euphonium, and Tuba (2)
MUSC 230—History of Music I (3)
MUSP 305, 306—Music Performance (Principal Instrument) (2, 2)
MUSC 490, 491—Conducting I, II (2,2)
MUSC 120, 114—Class Study: Cornet (2); Class Study: Cello and Bass (2)
MUED 470—General Concepts for Teaching Music (1)
MUED 411—Instrumental Music: Methods and Materials for the Elementary School (3)
MUED 420—Instrumental Music: Methods, Materials, and Administration for the Secondary School (2)
MUED 410—Instrumental Arranging (2)
MUED 472—Choral Techniques and Repertoire (2)
MUSC 330, 331—History of Music II, III (3, 3)
MUSP 409—Music Performance (Principal Instrument) (2)
MUSC 129, 229, 329—Ensemble (7)

Pre-Professional/Education Courses

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

Professional Education Courses

EDCI 484/494—Student Teaching in Elementary/Secondary Schools: Music (4,4)

General Music/Choral

Pre-Professional/Subject Area Courses

MUSP 109, 110—Music Performance (Principal Instrument) (2,2)
MUSC 150, 151—Theory of Music I, II (3,3)
MUSC 100—Beginning Class Voice (2), and MUSC 200 Intermediate Class Voice I (2)
MUSC 102, 103—Class Piano I, II (2, 2)
MUSC 110, 111—Class Study of String Instruments/Class Study of Wind and Percussion Instruments (2, 2)
MUED 197—Pre-Professional Experiences (1)
MUSP 207, 208—Music Performance (Principal Instrument) (2, 2)
MUSC 230—History of Music I (3)
MUSC 202, 203—Intermediate Class Piano I, II (2, 2)
MUSC 250, 251—Advanced Theory of Music I, II (4, 4)
MUSP 305, 306—Music Performance (Principal Instrument) (2, 2)
MUSC 453—Class Study of Guitar and Recorder (2)
MUED 472—Choral Techniques and Repertoire (2)
MUSC 490, 491—Conducting I, II (2, 2)
MUED 478—Special Topics in Music Education (2,2)
MUED 470—General Concepts for Teaching Music (1)
MUED 471—Methods for Teaching Elementary General Music (3)
MUSC 330, 331—History of Music II, III (3, 3)
MUSP 409—Music Performance (Principal Instrument) (2)
MUSC 129, 229, 329—Ensemble (7)

Pre-Professional/Education Courses

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

Professional Education Courses

EDCI 484/494—Student Teaching in Elementary/Secondary Schools: Music (4,4)

Science Education (Grades 5-12)

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

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

Pre-Professional Education Courses

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

Professional Education Courses

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

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

106 Curriculum and Instruction

Speech/English Education (Grades 5-12)

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

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

Pre-Professional/Subject Area Courses

Speech Area (6): COMM 107—Oral Communication: Principles and Practices, COMM 125—Interpersonal Communication, COMM 220—Small Group Discussion, COMM 230—Argumentation and Debate, COMM 330—Argumentation and Public Policy, COMM 340—Communicating the Narrative, COMM 470—Listening
COMM 200—Advanced Public Speaking (3)

Film elective (3)

HESP 202—Introduction to Hearing and Speech Sciences or HESP 305 or HESP 400 (3)

THET 110—Introduction to Theatre (3)

COMM 401—Interpreting Strategic Discourse (3)

COMM 402—Communication Theory and Process (3)

COMM Upper-level electives (6)

ENGL 101—Introduction to Writing (3)

LING 200—Introductory Linguistics (3) or ENG 280 (3)

ENGL 201—or 202 Western World Literature (3)

ENGL 281—Standard English Grammar, Usage, and Diction or ENGL 383 or ENGL 384 or ENGL 385 or ENGL 482 or ENGL 484 (3)

ENGL 301—Critical Methods in the Study of Literature or ENGL 453 (3)

ENGL 310, 311 or 312—English Literature (3)

ENGL 313, 430, 431, 432, 433—American Literature (3)

ENGL 391 or 393—Advanced Composition or Technical Writing (3)

Pre-Professional/Education Courses

EDPL 301—Foundations of Education (3)

EDHD 413—Adolescent Development (3)

EDHD 426—Cognition & Motivation in Reading: Reading in Content Areas I (3)

EDCI 463—Reading in the Secondary School (3)

Professional Education Courses

EDCI 417—Bases for English Language Instruction (3)

EDCI 340—Curriculum & Instruction in Secondary Education: Eng/Spch/Theatre (3)

EDCI 447—Field Experience in English, Speech, Theatre Teaching (I)

EDCI 466—Literature for Adolescents (3)

EDCI 467—Teaching Writing (3)

EDCI 440—Student Teaching Seminar in Secondary Education: English, Speech, Theatre (1)

EDCI 442—Student Teaching in Secondary Schools: Speech/English (12)

Theatre/English Education (Grades 5-12)

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

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

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

Pre-Professional/Subject Area Courses

THET 120—Acting I (3)

THET 170—Theatre Craft I (3)

THET 273—Scenographic Techniques or THET 476 or THET 480 (3)

THET 330—Play Directing I (3)

THET 460—Theatre Management I (3)

THET 479—Theatre Workshop II (3)

THET 490—Theatre History I (3)

THET 491—Theatre History II (3)

THET elective (3)

COMM 107—Oral Communication: Principles and Practices or COMM 200—or COMM 230 (3)

ENGL 101—Introduction to Writing (3)

LING 200—Introductory Linguistics (3) or ENGL 280

ENGL 201 or 202—Western World Literature (3)

ENGL 281—Standard English Grammar, Usage, and Diction or ENGL 383 or ENGL 384 or ENGL 385 or ENGL 482 or ENGL 484 (3)

ENGL 310, 311, or 312—English Literature (3)

ENGL 313—American Literature (3)

ENGL 301—Critical Methods in the Study of Literature or ENGL 453 (3)

ENGL 391 or 393—Advanced Composition or Technical Writing (3)

Pre-Professional/Education Courses

EDHD 413—Adolescent Development (3)

EDPL 301—Foundations of Education (3)

EDHD 426—Cognition & Motivation in Reading: Reading in Content Areas I (3)

EDCI 463—Reading in the Secondary School (3)

Professional Education Courses

EDCI 417—Bases for English Language Instruction (3)

EDCI 340—Curriculum & Instruction in Secondary Education: Eng/Spch/Theatre (3)

EDCI 467—Teaching Writing (3)

EDCI 466—Literature for Adolescents (3)

EDCI 447—Field Experience in English, Speech, Theatre Teaching (1)

EDCI 448—Student Teaching in Secondary Schools: Theatre/English (12)

EDCI 440—Student Teaching Seminar in Secondary Education: English, Speech, Theatre (1)

Social Studies Education (Grades 5-12)

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

Option I: HISTORY: This option, which requires completion of the foreign language requirement, is primarily for those students earning their initial degree. Requires 68 semester hours of which 39 credit hours must be in history. Twelve credit hours in 100-200 level introductory courses including HIST 156 and HIST 157, one course in non-Western history, and one course before 1500. Fifteen credit hours, including HIST 309, in one major area of concentration; 12 credit hours of history in at least two areas other than the area of concentration. In addition to the required credit hours in history, the program requires 29 credit hours of course work in geography and the social sciences as outlined below.

Pre-Professional/Subject Area Courses

Introductory Courses:

HIST 156 (3) (CORE: SH)

HIST 157 (3) (CORE: SH)

Non-Western History (3)

History 110 or 112 (3)

Area of Concentration:

History electives (12) (nine credits at the junior-senior level)

HIST 309 (3)

Two Areas Outside Concentration:

History electives (12) (nine credits at the junior-senior level)

GEOG 100 (3) (BSOS CORE)

GEOG 201/211 (3) (1) (CORE: PL)

SOCY OR ANTH (3)

ECON 200 (4)

ECON Elective (3)

GVPT 100, 260, or 280 (3) (CORE: SB)

GVPT 170 (3) (CORE: SB)

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

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

Option II: GEOGRAPHY: This option is primarily for those students earning their initial degree. Requires 63 credits hours of Pre-professional/Subject Area course work. Thirty-five credit hours must be in geography. GEOG 201, 211, 202, 212 are required. Nine credit hours of 300 level Gateway courses must be taken in physical geography, human geography, and

geographic techniques. The remaining 18 credit hours must include a quantitative methods course and 15 credit hours of upper level systematic geography courses. In addition to the required credit hours in geography, the program requires 28 credit hours of course work in history and the social sciences as outlined below.

Pre-Professional/Subject Area Courses

Primary Courses:

GEOG 201/211 (3),(1)
GEOG 202/212 (3),(1)

Gateway Courses:

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

Upper Level Geography Electives (15)

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

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

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

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

In addition to the required credit hours in GVPT the program requires thirty credit hours in history and the social sciences as outlined below.

Pre-Professional/Subject Area Courses

Introductory Courses:

GVPT 100/CORE (3)
GVPT 170/CORE (3)
GVPT 241 (3)
GVPT Electives (9)
GVPT Upper Level Courses (18)
BSOS 188A/HONR 100 (1)
Social Science Quantitative Course (3)
HIST 156 or HIST 157/CORE (3)
HIST at 100-200 level (non-Western) (3)
SOCY or ANTH (3)
ECON 200/CORE (4)
ECON—Elective (3)
Upper-Level GEOG/HIST (3)
GEOG 201 and 211/CORE (3,1)
GEOG 100/CORE (3)

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

All Options must complete the following Pre-Professional Education Courses:

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

All Options must complete the following Professional Education Courses:

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

DANCE (DANC)

College of Arts and Humanities

Dance Building, (301) 405-3180

Professor and Chair: Wiltz
Professors: Rosen, A. Warren
Associate Professor: K. Bradley
Instructor: Mayes
Emeriti: Madden, L. Warren
Lecturers: Druker, Jackson, Tyler
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

108 Decision and Information Sciences

DECISION AND INFORMATION SCIENCES

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

DIETETICS

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

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: Straszheim

Professors: Almon, Ausubel, Betancourt, Calvo††, Crampton, Cropper, Dorsey, Drazen, Evans, Haltiwanger, Hulten, Kelejian, Montgomery, Murrell, Oates, Panagariya, Prucha, Reinhart, Schelling* (Public Affairs), Schwab, Wallis

Associate Professors: Coughlin, Hellerstein, Lyon, Sakellaris, Sanders, Shea, Vincent

Assistant Professors: Binder, Broner, Chao, Gelbach, Kranton, Preis, Rodriguez

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 305 or 306) or economic statistics (ECON 321) as a prerequisite. As of September 1, 1999, all 400 level Economics classes meet this requirement. ECON 430, 449, 450, 451, 465, and 490 taken before that date do not fulfill the requirement;
- six other hours in any upper-division economics course except ECON 386.

(2) Additional Supporting Courses (15 hours)

Students must earn 15 hours of credit in upper-division courses in addition to the 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 AND LEADERSHIP (EDPL)

College of Education

2100 Benjamin Building, (301) 405-3574

Professor and Chair: Strike

Professors: Cibulka, Finkelstein, Hultgren, Klees, Selden

Associate Professors: Goldman, Herschbach, Lin, Mawhinney, Milem, Splaine

Assistant Professors: Cossentino, Croninger, Fries-Britt, Perna, Rice

Emeriti: Berdahl†, Berman, Birnbaum, Carbone, Clague, Dudley, Hawley, Male, McLoone, Newell, Schmidlein, Stephens

†Distinguished Scholar Teacher

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

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

ELECTRICAL ENGINEERING (ENEE)

A. James Clark School of Engineering

Department of Electrical and Computer Engineering

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

E-mail: eeceadv@deans.umd.edu

www.ece.umd.edu

Acting Chair: Marcus

Associate Chairs: Blankenship (External Relations), Goldhar (Facilities and Services), Orloff (Undergraduate Studies), Tits (Graduate Studies).

Professors: Abed, Antonsen, Baras (Martin-Marietta Chair in Systems Engineering), Barbe, Blankenship, Chellapa, Dagenais, Davis+, Declaris, Destler+, Ephremides, Farvardin, Gerniotis, Gligor, Goldhar, Goldsman, Granatstein, Ho, Ja'Ja', Krisnaprasad, Langenberg, Lawson, Lee, Levine, Liu, Makowski, Marcus, Mayergoyz+, Melngailis, Nakajima, Narayan, Newcomb, Orloff, Oruc, Ott+, Pecerar (part-time), Rabin, Rhee, Shamma, Shayman, Tits, Venkatesan, Vishkin, Yang, Zaki

Associate Professors: Iliadis, O'Shea, Papamarcou, Silio, Tassioulas, Tretter, Yang

Assistant Professors: Barua, Bhattachayya, Franklin, Gansman, Ghodssi, Gomez, Horiuchi, Jacob, Papadopoulos, Simon, Qu, Yeung

Emeriti: Davisson, Emad, Harger, 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

110 Engineering, Bachelor of Science, Degree In

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

Sophomore Year		
MATH 241—Calculus III	4	
MATH 246—Differential Equations		3
PHYS 262 & 262A—General Physics II	4	
PHYS 263 & 263A—General Physics III		4
ENEE 241—Numerical Techniques in Engineering	3	
ENEE 244—Digital Logic Design	3	
ENEE 204—Basic Circuit Theory		3
ENEE 206—Digital and Circuits Lab.....		2
CORE—General Education	3	3
Total	17	15

Junior Year

MATH 4xx*—Advanced Elective Math	3	
ENEE 302—Digital Electronics	3	
ENEE 306—Electronics Circuits Design Lab		2
ENEE 312—Semiconductor Devices and Analog Elects	3	
ENEE 322—Signal and System Theory.....	3	
ENEE 324—Engineering Probability		3
ENEE 350—Computer Organization	3	
ENEE 380—Electromagnetic Theory	3	
ENEE 381—Electromagnetic Wave Program		3
CORE/THEME—General Education	6	
Total	15	17

Senior Year

CORE/THEME—General Education	6	3
Technical Electives* (NON-EE Technical Electives)	3	6
Technical Electives** EE Electives	8	5
Total	17	14

*From approved Non-EE Technical Elective List

**Must include a Capstone Design Course

+Subject to approval by the Vice President's Advisory Committee

Admission

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

Advising

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

Financial Assistance

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

Honors and Awards

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

Department Honors Program

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

Student Organizations

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

Information on eligibility can be obtained from the departmental Undergraduate Office, or from the College Student Affairs Office. PIECE 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

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

General Regulations for the B.S. Engineering Degree

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

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

Options of the "B.S. Engineering" Program

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

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

The applied science option, which is not ABET-accredited, should be particularly attractive to those students who do not plan to pursue a professional engineering career but wish to use the rational and developmental abilities fostered by an engineering education as a means of furthering career objectives. Graduates of the applied science option may aspire to graduate work and an ultimate career in a field of science, law, medicine, business, or a variety of other attractive opportunities which build on a combination of engineering and a field of science. Entrance requirements for law and medical schools can be met readily under the format of this program. In the applied science program, any field in the university in which the student may earn a B.S. degree is an acceptable secondary science field, thus affording the student a maximum flexibility of choice for personal career planning.

Minimum Requirements

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

Junior-Senior Year Requirements

Engineering Option

Mathematics/Physical Science Requirements 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

Professor and Chair: Caramello

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

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

Assistant Professors: Bauer, Chuh, Grady, Nunes, Rutherford

Instructor: Terchek

Lecturers: Miller, Ryan

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

††Distinguished University Professor

†Distinguished Scholar Teacher

112 Entomology

Advising

Departmental advising is mandatory for all majors each semester.

The Major

The English major has been designed by the English Department faculty with three purposes in mind: 1) to give students a sense of the history and variety of literature written in English, 2) to introduce students to the debates about literature and language that shape our intellectual lives, and 3) to use the critical study of literature and language to help students think carefully and express themselves well. An English major 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 the College of Arts and Humanities requirement of a minimum of 45 upper-level credits and the foreign language requirement. The English major requires 39 credits in English beyond the two required University writing courses.

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

CORE Requirements (18 credits)

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

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

Specializations (12 credits)

(Four courses beyond the 6 CORE Requirements above)

Students choose one of the following:

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

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

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

English and English Education Double Major

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

Honors

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

The Writing Center

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

Citation in Renaissance Studies

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

Course Code: ENGL

ENTOMOLOGY (ENTM)

College of Life Sciences

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

Professor and Chair: Mitter

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

Associate Professors: Armstrong, Brown, Lamp, Nelson, Shultz, St. Leger, Thorne

Assistant Professors: Hawthorne, Richman, Shrewsbury

Instructor: Kent

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)

0102 Symons Hall, (301) 405-8571

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

Director: James

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

Requirements for Major

ENSP CORE

1. 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 120/40, GEOL 100-110, GEOG 201-211, NRSC 200, 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, ECON 321, PSYC 200, SOCY 201, STAT 400)
5. The Capstone course (ENSP 400 in the senior year)

Areas of Concentration

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

Advising

Advising is mandatory each semester. 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.umd.edu/fmst>

Professor and Chair: Koblinsky

Professors: Epstein, Gaylin, Hampton

Associate Professors: Anderson, Leslie, Mokhtari, Myricks, Randolph,

Rubin, Wallen

Assistant Professors: Braun, Kim, Walker

Instructors: Werlinich

Lecturer: Davis

Undergraduate Coordinator: Oravec

The Major

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

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

Curriculum

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

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

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

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

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

Course Code: FMST

FINANCE

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

114 Fire Protection Engineering

FIRE PROTECTION ENGINEERING (ENFP)

A. James Clark School of Engineering

0151 Martin Hall, (301) 405-3992

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

Professor and Chair: Milke

Professors: Brannigan, Quintiere

Associate Professors: Milke, Mowrer, Torero

Lecturers (part-time): Gagnon, Koffel, Simone

Emeriti: Bryan, Spivaic

Affiliate Professor: diMarzo

Adjunct Professor: Kashiwagi

The Major

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

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

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

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

Requirements for Major

Freshman Year	Fall	Spring
CORE Program Requirements (Incl ENGL 101)	3	6
CHEM 135—General Chemistry for Engineers	3	
MATH 140, 141—Analysis I, II	4	4
ENES 100—Introduction to Engineering Design	3	
ENES 102—Statics		3
PHYS 161—General Physics I		3
ENFP 108 (optional)—Hot Topics in Fire	1	
Total	14	16

Sophomore Year

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

Junior Year

CORE Requirements - incl. Advanced Studies	3	3
ENME 320—Thermodynamics*	3	
ENFP 300—Fire Protection Fluid Mechanics	2	

ENFP 310—Water Based Fire Protection Systems Design	3	
ENFP 312—Heat and Mass Transfer	3	
ENFP 320—Fire Assessment Methods and Laboratory	4	
ENFP 350—Professional Development Seminar	1	
General Elective - see advisor for details	3	
Approved Electives		
(STAT, ENFP, ENES, ENXX)**1	3	3
Total	16	16

Senior Year

CORE Advanced Studies - outside of dept.	3	
ENFP 405—Structural Fire Protection	3	
ENFP 411—Fire Protection Hazard Analysis	3	
ENFP 415—Fire Dynamics	3	
ENFP 416—Problem Synthesis and Design	3	
ENFP 421—Life Safety and Risk Analysis	3	
ENFP 425—Fire Modelling	3	
Approved Electives		
(STAT, ENFP, ENES, ENXX)**1	3	3
Total	15	12
Total Credit Hours		122

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

**At least 3 credits (1 course) of approved electives must be in ENFP.

3 credits (1 course) must also either be a statistics, mathematics or applied mathematics course.

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

See the department for an additional listing of approved electives.

Admission

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

Advising

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

Fieldwork and Internship Opportunities

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

Financial Assistance

Numerous scholarships and grants are available to students in the department from organizational and corporate sponsors. Information is available on eligibility, financial terms and retention criteria in the department Office. The majority of the scholarships are for junior and senior students, but some scholarships are available for first- and second-year students. Also refer to our web site at <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: Brami, Mossman, Verdaguer

Associate Professors: Black, Campagne, Falvo, Scullen

Assistant Professors: Frindéthié, Letzter, Wells

Lecturers: Amodeo, C. P. Russell, Thomas

Emeriti: Fink, Hage, 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

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 (12 credits): FREN 204, 250, 301, 401.

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 (24 credits)

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

French and International Business Option (24 credits)

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

Honors

A student may choose to do a departmental Honors version in the French Language Culture and Literature Option. The requirements are the same except that at least three of the upper-level courses, beginning with FREN 351, must be taken in the "H" version, and that, in addition to those

courses regularly taken for the major, the Honors student will take FREN 495H (Honors Thesis), for a total of 39 hours in French. For further information, consult the coordinator of the French Honors Program.

The Italian Major

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

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

Romance Languages

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

Course Codes: FREN, ITAL

Citations

Citation in French Language and Cultures

15 credit hours. Five courses in French from approved list of courses. Courses taken through Study Abroad programs may be applied. Contact the Director of Undergraduate Studies for more information.

Citation in Business Management for French Majors (1102B)

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

Citation in Business French

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

Citation in Italian Language and Culture

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

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

GEOGRAPHY (GEOG)

College of Behavioral and Social Sciences

2181 Lefrak Hall, (301) 405-4050

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

Associate Chair: Cirrincione

Chair: Goward

Professors: Goward, Justice, Prince, Townshend

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

Assistant Professors: Liang

Lecturers: Dibble, Eney, Kinerney, Zlatic

Professor Emeritus: Harper, Wiedel

Adjunct Faculty: Townsend, Tucker, Walthall, Williams

*Joint Appointment with unit indicated.

The Major

The Department of Geography offers programs of study leading to the Bachelor of Science (B.S.) degree. Many students find that the multiple perspectives of geography form an excellent base for a liberal arts education. The abilities to write clearly and to synthesize information and concepts are valued highly in geographical education and practice. Students of geography must master substantive knowledge either in the

116 Geography

physical/natural sciences or in the behavioral/social sciences in addition to methodological knowledge. Some advanced geography courses, such as geomorphology and climatology are physical science oriented; economic geography, urban systems, and population geography focus on the social sciences, while environmental studies, ecology, and the geography of human dimensions of global change combine the two. International interests are best pursued with complementary study in foreign languages and area studies.

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

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

Major Requirements Including Program Options

Within any of the specializations available in the geography major program it is possible for students to adjust their programs to fit their individual interests. The geography major totals 35 semester hours. In addition to the 35 semester hours, the geography major is required to take an additional 15 semester hours of supporting course work outside of the department. The hours can be either in one department or in an area of specialization. An area of specialization requires that a written program of courses be reviewed and placed on file by the department adviser. See Advising Office, Lefrak 2108, (301) 405-8085, e-mail geog-advise@umail.umd.edu, web page: <http://www.inform.umd.edu/GEOG>. Supporting courses generally are related to the area of specialty in geography. The pass-fail option is not applicable to major or supporting courses. A minimum grade of C in each course is required for major and supporting courses.

The required courses for geography majors are as follows:

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

Geography Primary Courses

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

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

Upper-Level Elective

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

Suggested Program of Study for Geography

	Semester Credit Hours
Freshman Year	
ENGL 101—Introduction to Writing	3
MATH 110—Elementary Mathematical Models or MATH 115—Precalculus	3
University CORE Distributive Studies	24

(To be chosen from the three categories of Humanities-Arts, Math-Sciences, and Social Sciences)

Sophomore Year

University CORE Distributive Studies	4
(To be chosen from Math-Sciences lecture-laboratory courses)	
GEOG 201—Geography of Environmental Systems	3
GEOG 202—The World in Cultural Perspective	3
GEOG 211—Geography of Environmental Systems Lab	1
GEOG 212—The World in Cultural Perspective Lab	1
Quantitative Methods (GEOG 305 or its equivalent)	3
Electives	15

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 Science/Computer Cartography Program

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

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

Geography and Social Studies Education Double Major

In conjunction with the Department of Curriculum and Instruction, the Geography Department offers a special 121 credit hours program for students wishing to double major in Geography and Social Studies Education - Geography Concentration, allowing them to teach geography at the secondary level. Early examination of requirements is encouraged to reduce the number of additional hours required. In addition to the Geography Departments required credits, the program requires 28 credit hours of course work in history and the social sciences. For a list of requirements, contact the Geography Undergraduate Advising Office. Requirements are also listed under the Department of Curriculum and Instruction Social Studies Education - Geography Concentration double major option.

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

118 Geology

Relative to the professional Geology track, in the secondary education track there is a reduction of two upper-level Geology course requirements, but the addition of two Education courses and a Meteorology requirement. Further coursework in Education (including student teaching) will be required in order to obtain a Maryland State Teaching Certification. Although Geology is by nature interdisciplinary, it is recommended that students consider taking additional courses in Astronomy, Biology and the philosophy of science in order to add to their educational breadth

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

Geology Requirements

One of the following:	4
GEOL 100/110—Physical Geology and Laboratory	
GEOL 120/110—Environmental Geology and Lab	
GEOL 102—Historical Geology	4
GEOL 322—Mineralogy	4
GEOL 340—Geomorphology	4
GEOL 341—Structural Geology	4
GEOL 393—Technical Writing	3
GEOL 394—Research Problems (Capstone)	3
GEOL 490—Field Camp	6
Plus 3 courses selected from:	
GEOL 342—Stratigraphy and Sedimentation	4
GEOL 445—Geochemistry	3
GEOL 451—Groundwater	3
GEOL 423—Optical Mineralogy	3
GEOL 443—Petrology	4
Credit hours—Geology requirement	41-43

Supporting Requirements

METO 200—Weather and Climate	3
CHEM 103—General Chemistry I	4
CHEM 113—General Chemistry II	4
MATH 140—Calculus I	4
MATH 141—Calculus II	4
PHYS 141—General Physics	4
Credit hours—supporting requirement	23

Education Requirements

6 credits chosen from the following:	
EDPL 301—Foundations of Education	3
OR EDPL 401—Educational Technology, Policy, and Social Change	3
EDHD 413—Adolescent Development	3
EDHD 426—Cognitive and Motivational Basis of Reading I	3
EDCI 463—Teaching Reading in Content Area II	3
Credit hours—Education requirement	6

Recommended:

ASTR 100 or 101—Astronomy
BSCI 105 and BSCI 106—Principles of Biology I and II
PHIL 250/HIST 174—Philosophy/History of Science
PHYS 142—General Physics, second semester
The remaining 6 credits of the Education courses listed above

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

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

The Geology Department offers a combined B.S./M.S. degree program for students interested in an expedited graduate degree in Geology. Students enrolled in the Combined Degree Program may count up to 9 credits of upper level coursework taken for their undergraduate degree toward the M.S. degree. For further information, please consult the Geology Department's Web Page: <http://www.geol.umd.edu> under "Programs of Study".

1. A GPA of at least 3.50.
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.

Geology Department Citations

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

These citations may be earned by students not majoring in Geology and are administered by the Geology Undergraduate Studies Director. A grade of "C" or better must be earned in all courses required for the citation. See <http://www.geol.umd.edu> for more information.

Surficial Geology Citation

Required: GEOL 120/110 (Environmental Geology), GEOL 123 (Global Change), GEOL 340 (Geomorphology), Plus one of: GEOL 451 (Hydrology), GEOL 452 (Wetland & Watershed Hydrology), GEOL 462 (Geological Remote Sensing)

Earth Material Properties Citation

Required: GEOL 100/110 (Physical Geology), GEOL 322 (Mineralogy), Plus two from: GEOL 210 (Gems and Gemstones), GEOL 341 (Structural Geology), GEOL 423 (Optical Mineralogy), GEOL 443 (Petrology), GEOL 445 (Geochemistry)

Earth History Citation

Required: GEOL 100/110 (Physical Geology), GEOL 102 (Historical Geology), Plus two from: GEOL 331 (Invertebrate Paleontology), GEOL 342 (Sedimentation & Stratigraphy), GEOL 436 (Biogeochemistry)

Hydrology Citation

Required: GEOL 100/110 (Physical Geology), GEOL 342 (Sedimentation & Stratigraphy), Plus two from: GEOL 436 (Biogeochemistry), GEOL 445 (Geochemistry), GEOL 451 (Hydrology) (3) GEOL 452 (Wetland & Watershed Hydrology)

All Geology citations are an appropriate disciplinary combination with Astronomy, Computer Science, Mathematics or Physics majors within the CMPS college. The citations are also targeted at majors outside the college, with appropriate matches including:

 Geography/Remote Sensing Students (Surficial Geology)
 Engineering and Material Science students (Earth Material Properties)
 Evolutionary Biology and Physical Anthropology students (Earth History)
 Biology, Biological Diversity and Ecology students (Hydrology)

Advising

The Geology Undergraduate Studies Director serves as the advisor for the geology majors, 1119 Geology Building, (301) 405-4379.

Honors

Admission to the Program is by invitation of the Honors Committee, normally at the end of the sophomore year and normally will be extended to students with an overall GPA of 3.0 or better and a GPA of 3.0 or better in all courses required for the major.

Graduation with Honors normally requires completion of the curriculum, a GPA of 3.5 or better in GEOL 393H and GEOL 394H, and maintenance of a 3.0 overall GPA and a GPA of 3.0 or better in all courses required for the major. Maintenance of a GPA of 3.5 or above and a grade of A in both GEOL 393H and GEOL 394H will earn the distinction of Graduation with High Honors.

The curriculum for Honors in Geology follows the University Honors Program Track I: Thesis Option with a 15 credit minimum.

1. The requirement for upper division Honors courses will be met by a minimum of 9 hours as follows:
 - a. GEOL 489H Recent Advances in Geology (3 credit hours), and

- b. 6 credit hours from the following:
- i) a 3 credit hour graduate-level course approved by the Departmental Honors Committee,
 - ii) Honors Option project in a three or four credit hour upper-level course from the offerings in the Geology Department. The Honors Option Proposal must be approved by the Departmental Honors Committee, the professor teaching the course and the University Honors Program. A proposal must be approved by the Department and submitted to the University Honors Program by the 10th day of class in the semester in which the course will be taken and the project completed.
2. The research and thesis requirement will be met by completion of GEOL 393H and GEOL 394H with a GPA of 3.5 or better (6 credit hours).

Honors and Awards

Bengt Svenonius Memorial Scholarship for graduating senior with the highest overall scholastic average; Fernow Memorial Faculty Field Camp Awards for geology majors to attend geology summer camp; Sigma Gamma Epsilon Award for a senior in geology for Outstanding Scholastic Achievement and service to the Society; and Best Senior Research Award.

Student Organizations

Sigma Gamma Epsilon, National Honor Society for Earth Sciences, and the Geology Club.

Course Code: GEOL

GERMANIC STUDIES (GERM)

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
 Assistant Professor: Alene Moyer
 Emeriti: Best, Herin, Jones
 †Distinguished Scholar Teacher

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

The Major

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

Advising

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

Requirements for Major

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

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

German Language Option

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

German Literature Option

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

Germanic Area Studies Option

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

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

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

Honors in German

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

Citations

Citation in Germanic Studies

15 credit hours. GERM 202 and 220 and/or 301. Two or three additional courses from approved list of courses. Courses taken through Study Abroad programs may be applied. Contact the Director of Undergraduate Studies for more information.

Citation in Business Management for German Majors (1103B)

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

Citation in Business German

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

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

Course Code: GERM

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[†], Elkin, Franda, Glass, Gurr, Heisler, Herrnson, Marando, Oppenheimer[†], Phillips, Pirages, Quester, Stone, Terchek, Tismaneanu, Uslaner, Walters* (Afro-American Studies)
 Associate Professors: Conca, Davenport, Gimpel, Graber, Haufler, Kaminski, Lalman, McIntosh, Pearson, Soltan, Swistak, Telhami, Williams, Wilson* (Afro-American Studies)
 Assistant Professors: Kaufmann, Kim, Morris, Schreurs, Schwedler
 Lecturer: Vietri
[†]Distinguished Scholar Teacher
 *Joint Appointment with unit indicated

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

120 Hearing and Speech Sciences

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

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

Majoring in Government and Politics and the Academic Review

Government and Politics is a limited enrollment program that has special requirements for admission as a 45-credit review. See Department for details.

Requirements for Major

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

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

Honors Program

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

Internships

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

Advising

Academic advising is available daily on a walk-in or appointment basis in the Undergraduate Advising Office, 1155 Tydings Hall.

Course Code: GVPT

HEARING AND SPEECH SCIENCES (HESP)

College of Behavioral and Social Sciences

0100 Lefrak Hall, (301) 405-4214

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

Professor and Chair: Ratner

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

Associate Professors: Roth

Assistant Professors: Haarmann, Hicks

Instructors: Banson, Battles, Dow, McCabe, Palmer, Perloth, Sisskin, Williams, Worthington

The Major

Hearing and speech sciences is an inherently interdisciplinary field, integrating knowledge from the physical and biological sciences, medicine, psychology, linguistics, and education in order to understand human communication and its disorders. The department curriculum leads to the Bachelor of Arts degree. An undergraduate major in this field is an appropriate background for graduate training in Speech-Language Pathology or Audiology, as well as for graduate work in other disciplines requiring a knowledge of normal or disordered speech language, or hearing. The student who wishes to work professionally as a speech-language pathologist or audiologist must obtain a graduate degree in order to meet national certification requirements, and most state licensure laws.

The hearing and speech sciences curriculum is designed in part to provide supporting course work for majors in related fields, so most course offerings are available to both departmental majors and non-majors. Permission of instructor may be obtained for waiver of course prerequisites for non-majors wishing to take hearing and speech courses of interest.

Requirements for Major

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

A student majoring in hearing and speech sciences must complete 33 semester hours of required courses (HESP 202, HESP 300, HESP 305, HESP 311, HESP 400, HESP 402, HESP 403, HESP 404, or HESP 406, HESP 407 and HESP 411) and six semester hours of electives in the department to satisfy major course requirements. No course with a grade less than C may count toward major course requirements. In addition to the 36 semester hours needed for a major, 9 semester hours of supporting courses in statistics and other related fields are required. For these 12 hours, a C average is required. In addition, when a HESP course has a listed pre-requisite, this pre-requisite must have been completed with a grade of C or better before registration in the subsequent course will be approved.

A guide to the major is available through the department office in room 0100 Lefrak or on the departmental website at <http://www.bsos.umd.edu/hesp/>

Course sequencing is extremely important within this major. Advising for majors is mandatory.

Required courses for the HESP major:

HESP 202—Introduction to Hearing and Speech Sciences	3
HESP 120—Introduction to Linguistics	3
PSYC 100—Introduction to Psychology	3
HESP 300—Introduction to Psycholinguistics	3
HESP 305—Anatomy and Physiology of the Speech Mechanism	3
HESP 311—Anatomy, Physiology, and Pathology of the Auditory System ...	3
HESP 400—Speech and Language Development in Children	3
HESP 402—Speech Pathology I: Language Disorders in Children	3
HESP 403—Introduction to Phonetic Science	3
HESP 404—Speech Pathology II: Voice and Fluency Disorders	3
OR	
HESP 406—Speech Pathology III: Aphasia and neuromotor disorders	3
HESP 407—Bases of Hearing Science	3
HESP 411—Introduction to Audiology	3

Electives—Students must take six credits from the following offerings:

HESP 109—Freshman seminar	3
HESP 386—Experiential Learning	3
HESP 417—Principles and Methods in Speech Language Pathology and Audiology.....	3
HESP 418—Clinical Practice in Speech Language Pathology and Audiology 3	
HESP 420—Deafness and sign language	3
HESP 422—Neurological bases of human communication	3
HESP 423—Phonetics for teachers of English as a second language	3
HESP 469—Honors thesis research	3
HESP 498—Seminar in Hearing and Speech Sciences (topics vary).....	3
HESP 499—Independent Study	3

Allied/Related Fields (9 credits):

In addition to a required statistics course, the student will take six 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.

CORE requirements:

HESP majors are required to select their CORE Life and Physical Science classes from the Departments of either BSCI or PHYS.

Departmental Honors

An Honors option in HESP is available to students. This option must be declared prior to the junior year, and requires a 3.5 or higher GPA overall and in HESP coursework. For specific information on procedures for completing the Honors option, consult the Undergraduate Director or the department guide.

Advising

Information on advising for hearing and speech sciences may be obtained by calling the department office, (301) 405-4214. An undergraduate program guide is available through the department office at 0100 Lefrak, or on the web at <http://www.bsos.umd.edu/hesp/>

Special Opportunities

The Department operates a sizeable Hearing and Speech Clinic (301-405-4218) and award-winning language enrichment preschool, the LEAP program. Both serve the campus and greater metropolitan area, and provide in-house opportunities for clinical observation and training. The department facilities also include a number of well-equipped speech, language and hearing research laboratories.

Student Organizations

Hearing and speech majors are invited to join the department branch of the National Student Speech-Language and Hearing Association (NSSLHA).

Course Code: HESP

HISTORY (HIST)**College of Arts and Humanities**

2115 Francis Scott Key Hall, (301) 405-4265

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

Professor and Chair: Lampe

Distinguished University Professors: Berlin, Brush, Gilbert, Harlant (Emeritus)

Professors: Bedos-Rezak, Belz, Callcott (Emeritus), Cockburn (Emeritus), Cole† (Emeritus), Eckstein, Evans (Emeritus), Foust (Emeritus), Friedel, Gerstle, Gordon (Emeritus), Gullickson, Herf, Harris, Henretta†, Holum, Jashemski† (Emerita), Kent (Emeritus), A. Olson†, K. Olson, Price, Rozenblit, Smith (Emeritus), Sutherland, Vaughan, Warren (Emeritus), Weinstein, Wright (Emeritus), Yaney (Emeritus), Zhang

Associate Professors: Barkley Brown, Breslow (Emeritus), Cooperman, David-Fox, Flack, Grimsted, Landau, Lapin, Majeska, Mayo, Moss, Muncy, Ridgway, Rowland, Sicilia, Sumida, Williams, Zilfi

Assistant Professors: Bradbury, Como, Gao, Gordon, Lyons, Mar, Palmié

Adjunct: Carr, Papenfuse

Affiliate: Moses, Struna

†Distinguished Scholar Teacher

The Department of History seeks to broaden the student's cultural background through the study of history and to provide preparation for those interested in law, publishing, teaching, journalism, civil service, military, museum work, archival and library work, diplomacy, business school, and graduate study.

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 **and including History 220**; 15 hours in one major area of concentration (see below); nine hours of history in at least two major areas other than the area of concentration: **History 420**. All courses for the major must be completed with a minimum grade of C, and 21 hours of the 39 total hours must be at the junior-senior (300-400) level.

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

I. Introductory Courses

1. The requirement is 12 hours at the 100-200 level taken in at least two geographical fields.
2. **One of these must be History 220.**
3. In considering courses that will fulfill this requirement, students are encouraged to:
 - a. select at least two courses in a sequence
 - b. select at least one course before 1500 and one course after 1500
 - c. sample both regional and topical course offerings. Students will normally take one or more introductory courses within their major area of concentration.

II. Major Area of Concentration

1. The requirement is 15 hours.
2. Students may choose an area of concentration that is either geographic, chronological, or thematic. Areas include:
 - a. Geographic regions: Latin America, Middle East, Britain and Western Europe, the United States, East Asia, Africa, Eastern Europe and Russia;
 - b. Chronological periods; ancient, medieval, early modern, and modern
 - c. Themes: science and technology, social and cultural, women and gender, African American, Jewish military, religious business, and economic.

III. Nine Hours of History in at Least Two Areas Outside the Area of Concentration

1. Students are encouraged to select mainly upper-level courses.
2. Students are encouraged to consider regional diversity.

IV. Capstone

History 420 will be taken in the senior year and may be inside or outside the area of concentration.

V. Supporting Courses Outside History

Nine credits at the 300-400 level in appropriate supporting courses; the courses do not all have to be in the same department. Supporting courses should study some aspect of culture and society as taught by other disciplines. A minimum grade of C is required.

A.P. and I.B. credits are accepted.

Honors

The purpose of the Honors Program in History is to allow promising undergraduates to develop historical and historiographical skills, in an atmosphere that guarantees personal attention and encourages hard work and excellence. The program is a four-semester, 12-credit sequence that culminates in a senior thesis, a major research paper written under the

122 Human Development

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

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

HUMAN DEVELOPMENT (INSTITUTE FOR CHILD STUDY) (EDHD)

College of Education

3304 Benjamin Building, (301) 405-2827

Acting Chair: Flatter

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

Associate Professors: Bennett, Flatter, Gardner, Klein, Marcus, Nettles, Robertson-Tchabo, Smith

Assistant Professors: Jones, Metsala

Emeriti: Dittman[†], Eliot, Fein, Goering, Hardy, Hatfield, Huebner, Morgan[†], Seefeldt, Tyler

[†]Distinguished Scholar Teacher

The Department of Human Development offers: (1) a major in Early Childhood Education; (2) undergraduate courses in human development at the 200-, 300-, and 400-levels; (3) graduate programs leading to the M.A., M.Ed., Ed.D., and Ph.D. degrees and the A.G.S. certificate; and (4) field experiences and internships to develop competence in applying theory to practice in schools and other settings. Concentrations in human development include infancy, early childhood, adolescence, adulthood, and aging. A specialization in educational psychology is available at the doctoral level. Research in educational psychology, social, physiological, personality and cognitive areas with emphasis on the social aspects of development enhance the instructional program.

Undergraduate courses and workshops are designed for pre-service and in-service teachers as well as for students preparing to enter human services vocations. Undergraduate students may elect human development courses in such areas as (1) infancy, (2) early childhood, (3) adolescence, (4) aging, and (5) educational psychology. Major purposes of undergraduate offerings in human development are (1) preparing people for vocations and programs which seek to improve the quality of human life, and (2) providing experiences which facilitate the personal growth of the individual.

Through the Institute for Child Study, the faculty provides consultant services and staff development programs for pre-school programs, parent groups, court systems, mental health agencies, and other organizations involved with helping relationships. Undergraduates may participate in these programs through course work and internships. If interested, contact the department/Institute.

Early Childhood Education

Graduates of the Early Childhood Education program receive a Bachelor of Science degree and meet the requirements for teaching preschool, kindergarten, and primary grades.

Requirements for Major Including Program Options

All Teacher Education Programs have designated pre-professional courses and a specified sequence of professional courses. Before students may enroll in courses identified as part of the professional sequence, they must first gain admission to the College of Education's Teacher Education Program.

Admission

Application for admission to the Teacher Education Professional Program must be made early in the semester prior to beginning professional courses. Admission procedures and criteria are explained in "Entrance Requirements" in the College of Education entry in chapter 6.

Advising

Advising is mandatory for all students desiring acceptance into the Teacher Education Program. Students will receive advising through advising workshops which will be held during the pre-registration period. Information regarding advising workshop schedules will be available each semester with pre-registration materials. Walk-in advising hours are also posted each semester. Check in the department office, Room 3304 Benjamin.

Honors and Awards

Early Childhood Education majors are eligible for the Ordwein Scholarship. Information is available in the Dean's office, Room 3119 Benjamin.

Required Courses

The following courses are required in the program of studies for Early Childhood and may also satisfy the University's general education requirements (CORE and USP). See departmental worksheets and advisers and the Schedule of Classes.

PSYC 100.....	3
*Social Science or History Courses: ANTH, GEOG, GVPT, ECON, SOCY.....	6
HIST 156	3
Biological Science with Lab: BIOL, BOTN, MICRO	4
Physical Science/Lab: ASTR, CHEM, GEOL, PHYS.....	4

Other Pre-Professional Requirements

COMM (100, 125, or HESP 202 recommended)	3
MATH 210, 211	4
MUSC 155	3
Creative Arts: One of the following: KNES 181, 183, 421; THET 120, 311, ARTT 100	3
Education Electives: One of the following: FMST 332; SOCY 343; NFSC 100, EDCI 416	3
EDCI 280—School Service Semester	3
EDCI 443A—Literature for Children and Youth	3
(The Early Childhood program is under review and redesign. Contact the Department of Human Development for information.)	

Professional Courses

The Early Childhood Professional Block I starts only in the Fall Semester and is a prerequisite to Professional Block II. All pre-professional requirements must be completed with a minimum grade of C before beginning the Early Childhood Professional Blocks. All pre-professional and professional courses must be completed with a minimum grade of C prior to student teaching. EDPA 301, Foundations of Education (3), is normally completed after Professional Block II. See adviser for program planning.

Professional Block I:

EDHD 313—Creative Activities and Materials for the Young Child	3
EDHD 425—Process and Acquisition of Reading	3
EDHD 312—Professional Development Seminar	3
EDHD 416—Special Topics	3
EDHD 419A—Human Development and Learning in School Settings	3

Professional Block II:

EDHD 314—Reading in the Early Childhood classroom: Part 1 - Instruction and Materials	3
EDHD 315—Reading in the Early Childhood classroom: Part 2 - Instruction and Materials	3
EDCI 316—The Teaching of Reading: Early Childhood	3
EDCI 374—The Teaching of Science: Early Childhood	3
EDCI 351—The Teaching of Mathematics: Early Childhood	3
EDHD 419B—Human Development and Learning in School Settings.....	3

Professional Block III:

EDHD 421—Student Teaching: Preschool	4
EDHD 422—Student Teaching: Kindergarten	4
EDHD 423—Student Teaching: Primary	8

Course Code: EDHD

HUMAN RESOURCE MANAGEMENT

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

JEWISH STUDIES PROGRAM (JWST)

College of Arts and Humanities

0113 Woods Hall, (301) 405-4975

Director: Marsha Rozenblit
Professors: Beck, Berlin, Rozenblit
Associate Professors: Cooperman, Lapin, Manekin
Assistant Professor: Fradkin
Instructors: Levy, Liberman

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.

Citation in Jewish Studies

Requirements: 15 credits in Jewish Studies, at least 9 of which must be at the upper level. Students must take 1 course each in Jewish history, literature, and thought, and 2 other courses in Jewish Studies. No more than 3 credits of lower level language can count toward the Citation. No more than 6 credits may be taken at an institution other than UMCP. Students must earn at least a "C" in each course.

Financial Assistance

The Meyerhoff Center for Jewish Studies, (301) 405-4975, offers scholarships for study in Israel. Applications for scholarships are accepted in early March.

See entries for Department of Asian and East European Languages and Cultures and East Asian Studies certificate elsewhere in this chapter. Students may also pursue a Jewish History concentration through the Department of History.

Course Code: JWST

JOURNALISM (JOUR)

For information, consult the College of Journalism entry in chapter 6.

KINESIOLOGY (KNES)

College of Health and Human Performance

2351 HLHP Building, (301)405-2450

Professor and Chair: Clark
Associate Chair: Phillips
Professors: Clark, Dotson, Ennis, Franks, Hagberg, Hurley, Iso-Ahola,
Associate Professors: Hatfield, Jeka, Phillips, Rogers, Wrenn
Assistant Professors: Brown, Chen, Contreras-Vidal, Mason, McDaniel,
VanderVelden
Instructors: Brown, Haufler, Lindle, Scott
Emeriti: Clarke, Eyler, Hult, Humphrey, Husman, Kelly, 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 2301). 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 Dr. Catherine Ennis for Physical Education (301-405-2478, ce22@umail.umd.edu) and Dr. Marvin Scott (301-405-2480, ms24@umail.umd.edu) or Mr. Wally Bixby for Kinesiological Sciences (301-405-2330, wb74@umail.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. Changes in requirements are under review. Students should consult the department for updated information.

Physical Education Degree Requirements

University	40
(Includes BSCI 105, BSCI 201)	
KNES Core (287, 293, 300, 350, 360, 370, 385)	22
Skill Labs (or Concept-based Performance Classes)	12
Pedagogical Sequence (183, 314, 371, 390, 491)	15
Supporting Courses	13
(BSCI 202, KNES 282, 333, 480)	
College of Education Requirements	12
Student Teaching	12

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

124 Landscape Architecture

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

University Core	40
(Includes BSCI 105, BSCI 201)	
KNES Core (287, 293, 300, 350, 360, 370, 385)	22
Skill Lab (or Concept-based Performance Classes)	12
Pedagogical Sequence (183, 314, 371, 390, 491)	15
Supporting Courses	13
(BSCI 202, KNES 282, 333, 480)	
College of Education Requirements	12
Student Teaching	12

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

Advising

Advising is mandatory for Physical Education majors and strongly recommended (but not mandatory) for Kinesiological Sciences majors. Students in both majors are encouraged to join the departmental list serv (electronic group information) for weekly updates and other information. Instructions for joining the list serv are available at the Main Office (HHP 2351). Students should also periodically check the Bulletin Boards near HHP 2335 for current information.

Advising appointments (with any available advisor) are made through the Main Office (301-405-2450). Drop-in hours for Kinesiological Sciences majors and general questions are often available in HHP 2330. Advisors can assist with registration procedures, program updates, answer questions, career guidance and referrals. Those with special needs (re-enrollment, academic warning, change of major, athletes) will need to see special advisors. 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

2146 Plant Sciences Building 301-405-4350
mh160@umail.umd.edu, md35@umail.umd.edu
<http://www.larch.umd.edu/>

Professor and Chair: R. Weismiller
Associate Professor and Coordinator: M. Hill
Associate Professor: J.B. Sullivan
Assistant Professors: S. Chang, D. Myers
Adjunct Assistant Professor: J. Myers
Instructor: D. Nola

The Major

The Department of Natural Resource Sciences and Landscape Architecture offers three undergraduate majors. Two lead to the bachelor of science (B.S.) degree; one in Natural Resource Sciences and the other in General Agriculture Sciences. The third major leads to a bachelor of landscape architecture (B.L.A.) degree. For additional information on General Agriculture Sciences and Natural Resource Sciences, see the entry for those programs elsewhere in this chapter.

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

Admission - Landscape architecture is a limited-enrollment program (LEP). See Chapter 1 of 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 - 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: 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 (BSCI 105, BSCI 106, BSCI 225, NRSC 201, PLSC 100, PLSC 101, PLSC 202). 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, PLSC 253, and an acceptable 4 credit plant sciences course with a laboratory (BSCI 105, BSCI 106, BSCI 225, NRSC 201, PLSC 100, PLSC 101, PLSC 202) 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 not pass the 45 credit review but believe they have special circumstances which should be considered should appeal directly to the Coordinator of the Landscape Architecture program.

Curriculum in Landscape Architecture

Landscape Architecture Degree (B.L.A.)

	Semester Credit Hours
GEOG 340—Geomorphology or	
GEOG 372—Remote Sensing	3
LARC 140—Graphic Fundamentals	3
LARC 141—Design Fundamentals	3
LARC 160—Introduction to Landscape Architecture	3
LARC 220—Land Surveying	2
LARC 240—Graphic Communications	3
LARC 241—Electronic Studio	3
LARC 263—History of Landscape Architecture.....	3
LARC 265—Site Analysis and Design	3
LARC 320—Principles of Site Engineering	3
LARC 321—Landscape Structures & Materials	3
LARC 340—Site Design Studio	4
LARC 341—Community Design Studio	4
LARC 420—Professional Practice	3
LARC 440—Urban Design Studio	4
LARC 450—Environmental Resources or	
LARC 451—Sustainable Communities	3
LARC 470—Landscape Architecture Seminar.....	3
LARC 471—Capstone Studio	4
MATH 115—Precalculus	3
NRSC 200—Fundamentals of Soil Science	4

PLSC 100—Introduction to Horticulture	4
PLSC 253—Woody Plant Materials I.	3
PLSC 254—Woody Plant Materials II	3
Total Major Requirements	74
Additional CORE Program requirements	27
Electives	19
Total	120

Internship Opportunities

Internships are available at nearby federal, state and county agencies as well as in private landscape architecture practices.

Student Organizations

The Landscape Architecture Student Association provides students with opportunities to get involved with on-campus activities. The club is chartered by the American Society of Landscape Architects.

Scholarships

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

LINGUISTICS (LING)

College of Arts and Humanities

1401 Marie Mount Hall, (301) 405-7002

Professor and Chair: Crain

Professors: Hornstein, Lightfoot

Associate Professors: Lombardi, Pietroski, Thornton, Uriagereka, Weinberg

Assistant Professors: Benua, Phillips, Poeppel, Resnik

Affiliate: Berndt, Brent, Burzio, Gasarch, Smolensky, Zanuttini, Zsiga

The Major

The Linguistics Department offers courses on many aspects of language study and an interdisciplinary major leading to a Bachelor of Arts. Language is basic to many human activities and linguistics relates to many other disciplines which include work on language.

Work on language has provided one of the main research probes in philosophy and psychology for most of the 20th century. It has taken on a new momentum in the last 30 years and language research has proven to be a fruitful means to cast light on the nature of the human mind and on general cognitive capacity. Several courses focus on a research program which takes as a central question: How do children master their native language? Children hear many styles of speech, variable pronunciations, and incomplete expressions, but, despite this flux of experience, they come to speak and understand speech effortlessly, instantaneously, and subconsciously. Research aims to discover how this happens, how a person's linguistic capacity is represented in the mind, and what the genetic basis for it is. Students learn how various kinds of data can be brought to bear on their central question and how that question influences the shape of technical analyses.

The major in Linguistics is designed for students who are primarily interested in human language *per se*, or in describing particular languages in a systematic and psychologically plausible way, or in using language as a tool to reveal some aspect of human mental capacities. Such a major provides useful preparation for professional programs in foreign languages, language teaching, communication, psychology, speech pathology, and artificial intelligence (and thus in computer work).

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

Requirements for Major

The major in Linguistics is 42 credits. The major consists of a "Core" of 18 credits plus 24 additional credits required for one of two tracks, "Linguistic Theory and a Language" or "Grammars and Cognition".

The double major is 27 credits - the core of 18 credits plus 3 upper level electives (9 credits). The double degree requires all 42 credits needed for the major.

(All linguistics courses are 3 credits each)

The Core (18 credits)

LING 200—Introductory Linguistics

LING 240—Language and Mind

LING 311—Syntax I (Fall only)

LING 312—Syntax II (Spring only)

LING 321—Phonology I (Fall only)

LING 322—Phonology II (Spring only)

Grammar and Cognition Tracks

PHIL 170 or 173 or 271

PHIL 360—Philosophy of Language

PSYC 100—Introduction to Psychology

PSYC 341—Introduction to Memory and Cognition

Two 300/400 level LING electives

Two electives from LING, PSYC, HESP, PHIL, or CMSC, chosen in consultation with the advisor.

Linguistic Theory and a Language Track

Six courses of study (or 18 credits total) in one language; one of these courses should be in the history or structure of the language, if offered.

Two 300/400 level LING electives.

When possible, the language of specialization should be the same as the one used to satisfy the College of Arts and Humanities' foreign language requirement. The specialization normally includes those courses that make up the designated requirement for a major in the chosen language. Special provision may be made for students who are native speakers of a language other than English and wish to conduct analytical work on the grammar of that language. A student may also study grammatical theory and English; the 18-hour concentration in English consists of courses in the history and structure of English to be selected in consultation with the student's Linguistics adviser.

For a double major, students need 27 credits in Linguistics, which normally include the LING courses for one of the two specializations.

Citation in Linguistics

15 credit hours. LING 200, 240, 321, 311 and one course from approved list of courses. Students who fulfill Citation requirements will receive a Citation on the official transcript. Please contact the Director of Undergraduate Studies for more information.

Course Code: LING

LOGISTICS, BUSINESS, AND PUBLIC POLICY

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

MANAGEMENT AND ORGANIZATION

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>

126 Materials and Nuclear Engineering

Chair: Christou

Professors: Armstrong* (Emeritus), Arsenault (Emeritus), Christou, Dieter* (emeritus), Ohlein, Ramesh, Roytburd, Rubloff, Salamanca-Riba, Smith (emeritus), Wuttig, Yeh

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

Assistant Professors: Kidder, Kofinas, Phaneuf, Takeuchi, Wilson

Adjunct: 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, and electronic materials. Students will gain the ability to solve problems in the design, processing and use of advanced materials. Students will have the opportunity to work with faculty and industry on complex problems through projects, internships, and research and co-op experiences. A wide variety of careers are open to graduates of this program ranging from production and quality control in the traditional materials industries to the molecular construction of electronic materials in ultra-clean environments, and to the applications of materials in electronic packages. The application of materials to solve environmental, energy, and reliability problems are also career options.

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

There is no program leading to a B.S. in Nuclear Engineering. Students may use Nuclear Engineering as a field of concentration in the Bachelor of Science Engineering Program.

Requirements for Major

Requirements for the Materials Science and Engineering major include thorough preparation in mathematics, chemistry, physics, and engineering science as well as the required University general education (CORE) requirements. All students will be required to select an area of specialization, an upper-class science elective, and two technical electives. A minimum of 123 credits is required for a bachelor's degree. A sample program follows:

	Semester	
	I	II
Freshman Year		
CORE Program Requirements		6
ENES 100—Introduction to Engineering Design	3	
ENMA 181*, Introduction to Engineered Materials, Seminar	1	
CHEM 135—General Chemistry for Engineers	3	
MATH 140—Calculus I	4	
MATH 141—Calculus II	4	
ENGL 101—Introduction to Writing	3	
ENES 102—Statics	3	
PHYS 161—General Physics I	3	
Total	14	16

*Recommended, but not required.

Sophomore Year

Core Program Requirements	3	3
MATH 241—Calculus III	4	
MATH 246—Differential Equations for Scientists and Engr	3	
PHYS 262-263—General Physics	4	4
ENES 230—Introduction to Materials and their Applications	3	
ENEE 204—Basic Circuit Theory	3	
CHEM 233—Organic Chem, or CHEM 481*, Phys. Chem. I	4 or 3	
Total	14	17,16

*Chem 233 is required for students specializing in organic materials

Junior Year

CORE Program Requirements	3	3
ENMA 310—Materials Laboratory I, Structural Characterization	3	
ENMA 311—Materials Laboratory II: Electromagnetic Properties	3	
ENMA 362—Mechanical Properties	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 481—Electronic Materials; ENMA 499—Laboratory Projects

Applications of Materials and Manufacturing: ENMA 472—Technology and design of Engineering Materials; ENMA 489A—Design of Composites; ENMA 489L—Manufacturing Ceramics; ENMA 489R—Manufacturing Polymers; ENME 400—Machine Design; ENME 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

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

Advising

Students choosing materials science and engineering as their major or materials engineering as their primary or secondary field of concentration should contact Ms. Kathleen Hart, the Undergraduate Secretary, Room 2309, Chemical and Nuclear Engineering Building, at (301) 405-5209. Ms. Kathleen Hart can set up appointments with Professors Kidder, Kofinas and Wilson, the Undergraduate Advisors. Any questions about the program should be directed to Dr. Peter Kuofinas, Undergraduate Studies Director.

Co-op Program

The Materials Science and Engineering program works within the A. James Clark School of Engineering Cooperative Engineering education Program. For details, see the A. James Clark School of Engineering entry in chapter 6.

Financial Assistance

Financial Aid based upon need is available through the Office of student Financial Aid. Faculty Merit Scholarships are offered to outstanding students by the department. Other scholarships are available through the A. James Clark School of Engineering. The department offers opportunities for research internships with faculty.

Honors and Awards

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

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

Course Code: ENMA

Nuclear Engineering Program (ENNU)

2309 Chemical and Nuclear Engineering Building, (301) 405-5209
<http://www.mne.umd.edu>

Professor and Chair: Christou
 Professors: Christou, Modarres, Mosleh, Roush, Wolf
 Associate Professor: Al-Sheikhly, Pertmer
 Assistant Professors: Gavrilas
 Emeriti: Duffy, Hsu, Munno, Silverman, Almenas
 Lecturer: D. Ross

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

There is no program leading to a B.S. in Nuclear Engineering. Students may use Nuclear Engineering as a field of concentration in the Bachelor of Science Engineering Program.

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
Freshman Year		
MATH 140—Calculus I	I	4
MATH 141—Calculus II	II	4
PHYS 161—General Physics		3
ENES 100—Introduction to Engineering Design		3
ENES 102—Statics		2
CHEM 135—General Chemistry for Engineers		3
CORE Program Requirements (including ENGL 101)		6
Total		13
		15

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
FNFS 221—Dynamics	3

ENNU 215—Intro. to Nuclear Technology	3
CORE Program Requirements	3
Total	14
	16

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
ENEE 300—Principles of Electrical Engineering	3
ENGL 393—Technical Writing	3
Math-Physical Science Elective	3
CORE Program Requirements	3
Total	16
	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
	15

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 405-3863.

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. Kathleen Hart, Undergraduate Secretary, Room 2309, Chemical and Nuclear Engineering Building, at (301) 405-5209 or call Professor Gavrilas, the Undergraduate Advisor, at (301) 405-5832 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

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

Professor and Chair: Fitzpatrick

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

Associate Professors: Berg, Dancis, Helzer, Hunt***, Lee, Smith, von Petersdorff, Warner, Winkelkemper, Wu

Assistant Professors: D. Cooper**, Dolzmann, B. Li, Ramachandran, Trivisa, Yu

Professors Emeriti: Alexander, Babuska††, Brace, Correl, Edmundson, Ehrlich, Goldberg, Goldhaber, Good, Heins, Horvath, Hubbard, Hummel, Kellogg, Kirwan, Kleppner, Lehner, Markley, Neri, Olver, Owings, Syski, Zedek

Associate Professors Emeriti: Sather, Schneider

Affiliate Professors: O'Leary, Stewart, Young

Adjunct Professor: Rinzel

†Distinguished Scholar Teacher

††Distinguished University Professor

**Joint Appointment: Department of Curriculum and Instruction

***Joint Appointment: IPST

****Associate Dean, CMPS

*****Dean, CMPS

The program in mathematics leads to a degree of Bachelor of Science in mathematics and offers students training in preparation for graduate work, teaching, and positions in government or industry. Mathematical training is integrated with computer use in several courses. Because a strong mathematical background is important in several fields, over a third of UMCP mathematics majors are double majors. Additional information on these topics and mathematics is available from the department website.

Requirements for Major

There are three tracks for the major, the traditional track the secondary education track, and the statistics track. The secondary education track is for students seeking to become certified to teach mathematics at the secondary level. Each mathematics major must complete each required course with a grade of C or better.

TRADITIONAL TRACK

Major Requirements:

1. The introductory sequence MATH 140, 141, 240, 241 or the corresponding honors sequence MATH 350-351.
2. Eight MATH/AMSC/STAT courses at the 400-level or higher, at least four of which are taken at College Park. The eight courses must include:
 - (a) At least one course from MATH 401, 403, 405.
 - (b) 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.
 - (c) One course from AMSC 460, 466.
 - (d) MATH 410 (completion of MATH 350-351 exempts the student from this requirement and (e) below; students receive credit for two 400-level courses.)
Students are strongly encouraged to complete MATH 310 prior to attempting MATH 410.
 - (e) A one-year sequence which develops a particular area of mathematics in depth, chosen from the following list:
 - (i) MATH 410-411
 - (ii) MATH 410-412
 - (iii) MATH 403-404
 - (iv) MATH 403-405
 - (v) MATH 446-447
 - (vi) STAT 410-420
 - (f) The remaining 400-level MATH/AMSC/STAT courses are electives, but cannot include any of: MATH 400, 461, 478, or STAT 464. Also, students with a strong interest in applied mathematics may, with the approval of the Undergraduate Office, substitute two courses (with strong mathematics content) from outside the Mathematics Department for one upper-level elective course.

3. One course from CMSC 105, 106, 114 or ENEE 114. Student may be exempt from this requirement if he or she can demonstrate adequate programming knowledge from prior course or work experience.
4. One of the following supporting three-course sequences. These are intended to broaden the student's mathematical experience. Other sequences might be approved by the Undergraduate Office but they would have to make use of mathematical ideas, comparable to the sequences on this list.
 - (a) (i) PHYS 161-262-263
 - (ii) PHYS 171-272-273
 - (iii) PHYS 141-142, and an upper-level physics course approved by the Mathematics Department
 - (b) ENES 102, PHYS 161, ENES 220
 - (c) (i) CMSC 114-214 and one of CMSC 311, 330
 - (ii) CMSC 114-150-251
 - (d) CHEM 103-113, and one of CHEM 227, 233
 - (e) ECON 200-201 (previously ECON 201-203), and one of ECON 305 or 306
 - (f) BMGT 220-221-340.

SECONDARY EDUCATION TRACK

Major Requirements:

1. The introductory sequence MATH 140, 141, 240, 241 or the corresponding honors sequence MATH 350-351.
2. Seven MATH/AMSC/STAT courses at the 400-level or higher, at least four of which are taken at College Park. The seven courses must include:
 - (a) MATH 410
 - (b) MATH 402 or MATH 403
 - (c) MATH 430
 - (d) STAT 400 or STAT 410
 - (e) At least one course from MATH 406, 445, 446, 447, 450, 456 or 475.
 - (f) At least one course from Math 246, 401, 420, 452, 462, or 472 or AMSC 460 or 466. If MATH 246 is chosen, it will not count as one of the seven upper-level courses.
 - (g) The remaining 400-level MATH/AMSC/STAT courses are electives, but cannot include any of: MATH 400, 461, 478, or STAT 464.
3. At least one of the courses CMSC 105, 106, 114, or 214 or any CMSC course requiring one of these as a prerequisite.
4. EDCI 450 and 451.
5. One of the following supporting two course sequences. These are intended to broaden the student's mathematical experience.
 - (a) CHEM 103 and 104
 - (b) CHEM 103 and 113
 - (c) PHYS 221 and 222
 - (d) PHYS 161 and 262
 - (e) PHYS 141 and 142
 - (f) BIOL 105 and 106
 - (g) ASTR 200 and a second 3-credit ASTR course, excluding ASTR 100, 101, 110, and 111.
 - (h) METO 200 and 201, and any 400 level METO course.
 - (i) GEOL 100 and 110, and one of GEOL 322 or GEOL 341.
 The student-teaching pair EDCI 450-451 is 15 credits and has further prerequisites in the College of Education. In order to take these courses the student must be admitted into the College of Education. A student in the secondary education track of the mathematics major would normally be expected to receive a double major in Mathematics and Mathematics Education.

STATISTICS TRACK

Major Requirements:

1. The introductory sequence MATH 140, 141, 240, 241 or the corresponding honors sequence MATH 350-351.
2. One course from MATH 246 and 414. If MATH 414 is chosen it may count in requirement 3(g) below.
3. Eight additional courses, at least four of which must be taken at College Park. The eight courses are prescribed as follows:
 - (a) One course from MATH 410 and 350
 - (b) One course from AMSC 460 and 466
 - (c) One course from MATH 401 and 405
 - (d) STAT 410

- (i) Any 400-level or higher STAT courses except STAT 464
 - (ii) MATH 351, 411, 412, 414, 420, 464
 - (iii) AMSC 477
 - (iv) BIOM 402
4. CMSC 106 or a similar programming course approved by the Mathematics Department. Students may be exempt from this requirement if he or she can demonstrate adequate programming knowledge from a prior course or work experience.
 5. One of the three-course supporting sequences listed in the "Traditional Track" above (part 4).

AREAS OF STUDY

Within the Department of Mathematics there are a number of identifiable areas which students can pursue to suit their own goals and interests. They are briefly described below. Note that they do overlap and that students need not confine themselves to one of them.

130 Mathematical Statistics Program

MATHEMATICAL STATISTICS PROGRAM

College of Computer, Mathematical and Physical Sciences

1105 Mathematics, (301) 405-5061

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

Director: Kedem

Professors: Freidlin, Kagan, Kedem, Slud, Yang

Associate Professors: Smith

Professor Emeritus: Syski

The Mathematical Statistics Program is a graduate program for students concentrating in the study of Statistics, Probability and their application in real world problems. An undergraduate program emphasizing Statistics is available to majors in Mathematics, and undergraduate citations in Statistics and in Actuarial Mathematics are also available. All STAT courses carry credit in Mathematics.

Course code: STAT

MEASUREMENT, STATISTICS, AND EVALUATION (EDMS)

College of Education

1230 Benjamin Building, (301) 405-3624

<http://www.education.umd.edu/EDMS>

Professor and Chair: Lissitz

Professors: Dayton, Macready, Mislevy, Stunkard (Emeritus)

Associate Professors: Hancock, Johnson, Schafer (Emeritus)

Assistant Professor: Roberts

Adjunct Professor: Peng

Affiliated Professor: Rudner

Affiliated Associate Professor: Von Secker

Affiliated Assistant Professor: Fein

For Advanced Undergraduates and Graduates

The Department of Measurement, Statistics, and Evaluation 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. or B.S., subject to department 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, Azarm, Barker, Baz, Bernard, Dasgupta, diMarzo, Duncan, Fourney, Gupta, A., Holloway, Joshi, Magrab, Ohadi, Pecht, Piomelli, Radermacher, Wallace

Associate Professors: Balachandran, Bigio, Han, Herold, Sandborn, Shih, Wang, Zhang

Assistant Professors: Balaras, Bruck, Buckley, Chen, DeVoe, Gupta, S., Herrmann, Hristu-Versakalis, Jackson, Kiger, Kim, McCluskey, Mead, Ramahi, Robbins, Schmidt, Smela, Walsch

Lecturers: Ainane, Coder, Etheridge, Graham, Haslach

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

The Major

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

The mechanical engineer of today faces a more extensive range of critical problems than ever before. It is essential that the graduate be skilled not only in the traditional fundamentals of mechanical engineering such as solid mechanics, fluid mechanics, thermodynamics, heat transfer, materials engineering, electronic instrumentation and measurements, controls and design, but also in new and emerging areas such as mechatronics, smart structures, electronic packaging, communication, information systems, total quality management, reliability and electromechanical systems. Most of these topics require extensive use of modern computing hardware and software. New classrooms which are equipped with state-of-the art computers and software have been added and these facilities are used as an on-going part of many courses. The student is taught to make use of this capability and to make sound engineering judgments while analyzing the seemingly unmanageable amounts of data and information which are obtained. Attributes such as teamwork, ethics, social awareness, and leadership are emphasized in many courses.

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

Requirements for Major

	Semester Credit Hours	
	I	II
Freshman Year		
MATH 140—Calculus I.....	4	
MATH 141—Calculus II		4
CHEM 135—General Chemistry for Engineers.....	3	
PHYS 161—General Physics.....		3
ENGL101—Introduction to Writing.....	3	
ENES 100—Introduction to Engineering Design.....	3	
ENES 102—Statics.....		3
CORE Requirements	6	
Total Credits	13	16

Sophomore Year

MATH 241—Calculus III	4	
MATH 246—Differential Equations		3
PHYS 262, 263—General Physics.	4	4
ENES 220—Mechanics of Materials	3	
ENES 221—Dynamics	3	
ENME 232—Thermodynamics		3
ENME 271—Introduction to MATLAB	3	
CORE Requirements	3	
Total Credits	17	16

Junior Year

ENME 331—Fluid Mechanics.....	3	
ENME 332—Transfer Processes		3
ENME 350—Electronics and Instrumentation I	3	
ENME 351—Electronics and Instrumentation II	3	
ENME 361—Vibration, Controls, and Optimization I	3	
ENME 371—Product Engineering and Manufacturing.....	3	
ENME 382—Engineering Materials and Manufacturing Processes	3	

ENME 392—Statistical Methods for Product and Process Development	3
ENGL 393 —Technical Writing	3
CORE Requirements	3
Total Credits	15

Senior Year

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

*At least three of the four technical electives must be design.

Sample Elective Topics

Computer-Aided Design and Manufacturing
Packaging of Electronic Systems
Energy Conversion
Engineering Management
Engineering Software Development
Environmental Engineering
Fracture Mechanics
Automotive Design
Robotics
Manufacturing
Mechatronics
Fluid Machinery

Admission

Admission requirements are identical to those set by the Clark School of Engineering. Please consult chapter 1.

Advising

All mechanical engineering students are required to meet with an adviser during registration. Contact the Undergraduate Advising Office, 2188 Engineering Classroom Building.

Cooperative Education Program

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

Financial Assistance

A very limited amount of financial aid is available. Information may be obtained in the Undergraduate Advising Office.

Honors and Awards

The Honors Program is administered through the Clark School of Engineering. Individual honors and awards are presented based on academic excellence and extracurricular activities.

Student Organizations

Student chapters of professional societies include the American Society of Mechanical Engineers, the Society of Automotive Engineers, the Society of Manufacturing Engineers, and the American Society of Heating, Refrigeration and Air Conditioning Engineers. The mechanical engineering honor society is Pi Tau Sigma. Information regarding these societies may be obtained at 2188 Engineering Classroom Building.

Course Code: ENME

METEOROLOGY (METO)

College of Computer, Mathematical, and Physical Sciences

3424 Computer and Space Sciences Building, New Wing (301) 405-5391
<http://atmos.umd.edu>

Professor and Chair: Kalnay
Professors: Baer, Busalacchi, Carton, Dickerson, Ellingson, Hudson, Li, Pinker, Thompson, Vernekar (Emeritus) and Zhang
Assistant Professor: Zeng

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

Citation in Meteorology
Citation in Weather and Climate
Citation in Atmospheric Chemistry

The Citation in Meteorology is the most suitable preparation for graduate students in Meteorology. For more details visit: <http://atmos.umd.edu/CITATION> or contact the Undergraduate Advisor, R. Hudson: (hudson@atmos.umd.edu).

The following undergraduate courses are offered in METO:

METO 123—Global Change—Implications of Global Climate Change
METO 200—Weather & Climate—Atmospheric sciences and forecasting
METO 201—Weather & Climate Lab—Laboratory for METO 201
METO 400—The Atmosphere—Weather and Climate Systems
METO 401—Global Environment—The Atmosphere-Ocean-Biosphere
METO 431—Meto Scientists & Engineers I—Meteorology for Scientists and Engineers I
METO 432—Meto Scientists & Engineers II—Meteorology for Scientists and Engineers II
METO 434—Air Pollution—Generation, transport and removal of air pollutants
METO 499—Special Problems in Atmospheric Sciences—Research in Atmospheric Sciences

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

MICROBIOLOGY

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

SCHOOL OF MUSIC (MUSC)

College of Arts and Humanities

Tawes Fine Arts Building, (301) 405-5549

Director: Kendall
Associate Directors: Fry, Miller
Professors: Cohen, Cossa, DeLio, Elsing, Fischbach, Folstrom, Guarneri String Quartet (Dalley, Soyer, Steinhardt, Tree), Heifetz, Koscielnny, Mabbs, Major, McCoy, Montgomery, Moss†, Pacholczyk, Page, Robertson, Rodriguez
Associate Professors: Balthrop, Barnett, Davis, Dedova, Elliston, Gekker, Gibson, Gowen, Hill, Loup, McCarthy, Salness, Sparks, Vadala, Wakefield, Wexler, Wilson
Assistant Professors: DeLapp, Hanninen, King, Payerle, Sloan
Instructor: Walters
Lecturers: Beicken, McConnell, Randall, Smith
†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

132 Natural Resources Management Program

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	I II
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	I II
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

Citations

Citations in Music Performance

16 credit hours. MUSC 129, 229, 329, 130, and 140; MUSP 302 (prer MUSP 203), and MUSP 303 (prer MUSP 302); and one elective from approved list of courses.

Citation in Music Studies

15 credit hours. MUSC 130, 140; MUET 210 or 200; and two electives from approved list of courses.

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

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

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@uemail.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
BSCI 105—Principles of Biology I	4
BSCI 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
NRSC 200—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
BSCI 460, 461—Plant Ecology and Plant Ecology Laboratory	5
One of the following:	
GEOG 340—Geomorphology OR	3
GEOL 340—Geomorphology	4
BSCI 223—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

NATURAL RESOURCE SCIENCES (NRSC)

College of Agriculture and Natural Resources

2102 Plant Sciences Building
301-405-4351, 301-405-4355
cw5@umail.umd.edu, kh26@umail.umd.edu
<http://www.agnr.umd.edu/users/nrsl/>

Professor and Chair: Weismiller
Professors: Angle, Dernoeden, James, Kenworthy, McIntosh*, Miller,
Mulchi, Ng, Quebedeaux, Rabenhorst, Solomos, Walsh, Weil
Associate Professors: Beste, Bouwkamp, Carroll, Coale, Deitzer, Glenn,
Grybauskas, M. Hill, R. Hill, McClurg, Ritter, Slaughter, J.B. Sullivan,

Swartz, Turner, Vough
Assistant Professors: Chang, Coleman, Costa, Dzantor, Everts, Kratochvil,
Lea-Cox, Momen, Myers, J.H. Sullivan
Instructors: Buriel, Mityga, Nola, Steinhilber
Professor of the Practice: Cohan
Affiliate Professors: Balge, Kearney, Terlizzi
Adjunct Professors: Chappelle, Lee, Tamboli, Thomas
Adjunct Associate Professors: Daughtry, Meisinger, Montroll, Saunders,
Van Berkum
Adjunct Assistant Professor: Pooler, J. Myers
Professors Emeriti: Aycok, Axley, Bandel, Clark, Decker, Fanning, Gouin,
Hoyert, Kuhn, Link, Miller, Oliver, Shanks, Stark, Thompson, Wiley
*Distinguished Scholar Teacher

The Major

The Department of Natural Resource Sciences and Landscape Architecture
offers three undergraduate majors. Two lead to the bachelor of science
(B.S.) degree; one in Natural Resource Sciences and the other in General
Agriculture Sciences. The third major leads to a bachelor of landscape
architecture (B.L.A.) degree. For additional information on General
Agriculture Sciences and Landscape Architecture, see the entry for those
programs earlier in this chapter.

Undergraduate students enrolled in the Natural Resource Sciences major
must select one of the following six areas of concentration:

Conservation of Soil, Water and Environment (Area A)
Horticulture and Crop Production (Area B)
Landscape Management (Area C)
Plant Science (Area D)
Turf and Golf Course Management (Area E)
Urban Forestry (Area F)

The Natural Resource Science major combines the principles of basic
science with a thorough understanding of plant, soil and environmental
sciences. This amalgamation of basic and applied sciences provides
graduates with the opportunity for careers in conserving soil and water
resources, improving environmental quality, increasing crop production to
meet the global need for food, and in the "Green Industry" which involves
beautifying and maintaining the urban landscape.

These NRSC curricula are flexible enough to allow the student to
concentrate on basic science courses that are needed for graduate work or
to select courses that prepare for employment after completing a
bachelor's degree. NRSC areas of concentration such as "Plant Science" or
"Conservation of Soil, Water and the Environment" are meant to specifically
prepare students for graduate studies. Students completing graduate
programs in NRSC are prepared for research, teaching, and management
positions with industry, international agencies, or federal and
state government.

Graduates with a 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. Horticulture is a diverse profession that
also has numerous employment opportunities for NRSC graduates. These
range from fruit, vegetable, floral and nursery crop production to urban
forestry and landscape management. NRSC graduates are also in high
demand world-wide in traditional horticultural production, international trade
and in the growing fields of biotechnology and bioremediation.

Curriculum in Natural Resource Sciences

NRSC Major

Requirements for all Areas of Concentration	Semester Credit Hours
CHEM 103—General Chemistry I	4
ENGL 101—Introduction to Writing	3
ENGL 393—Technical Writing	3
MATH 113—College Algebra with Applications, or MATH 115—Precalculus	3
NRSC 200—Fundamentals of Soil Science	4
NRSC 398—Seminar	1
PLSC 100—Introduction to Horticulture, or PLSC 101—Introductory Crop Science	4

With the exception of ENGL 101 and ENGL 393, a grade of C or better in
the above courses is required.

134 Natural Resource Sciences

Area A: Conservation of Soil, Water and Environment Requirements

CHEM 113—General Chemistry II	4
CHEM 104—Fundamentals of Organic and Biochemistry, or	
CHEM 233—Organic Chemistry I	4
COMM 100—Foundations of Oral Communication, or	
COMM 107—Oral Communication: Principles and Practices	3
GEOL 100/110—Physical Geology	4
MATH 140—Calculus 1, or	
MATH 220—Elementary Calculus I	4
PHYS 117—Introduction to Physics	4

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

Applications & Breadth (Select three of the following)9

NRSC 413—Soil and Water Conservation	3
NRSC 415—Soil Survey and Land Use	3
NRSC 423—Soil-Water Pollution	3
NRSC 444—Remote Sensing of Agric and Natural Resources	3
NRSC 461—Hydric and Hydromorphic Soils	3

Advanced Soil Science (Select three of the following)9-11

NRSC 411—Principles of Soil Fertility	3
NRSC 414—Soil Morphology, Genesis and Classification	4
NRSC 417—Soil Hydrology and Physics	3
NRSC 421—Soil Chemistry	4
NRSC 422—Soil Microbiology	3

Practical Experience (Select at least 2 credits)2

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

Supporting Courses (Select two of the following)6

AREC 432—Introduction to Natural Resources Policy	3
BIOM 301—Introduction to Biometrics	3
ENBE 234—Principles of Erosion and Water Control (1) and	
ENBE 236—Design of Drainage Systems (1) and	
ENBE 237—Design of Irrigation Systems (1)	3
GEOL 451—Groundwater Geology	3
GEOL 452—Watershed and Wetland Hydrology	3
GEOL 340—Geomorphology (4), or	
GEOG 340—Geomorphology	3
NRMT 451—Water Quality: Field and Lab Analysis Methods	3
NRSC 440—Crops, Soils and Civilization	3
NRSC 441—Sustainable Agriculture	3
NRSC 454—Environmental Issues in Plant and Soil Sciences	3
PLSC 406—Forage Crops	3
PLSC 407—Cereal and Oil Crops	3

Total CORE, NRSC and Conservation of Soil, Water and Environment Area	95
University Electives	25

Area B: Horticulture and Crop Production Requirements

AREC 250—Elements of Agricultural and Resource Economics	3
AREC 306—Farm Management	3
BSCI 226—Plant Taxonomy, or	
BSCI 490—Plant Structure	4
BSCI 227—Principles of Entomology	4
CHEM 104—Fundamentals of Organic & Biochemistry	4
NRSC 201—Plant Structure and Function	4
NRSC 389—Internship	3
NRSC 410—Principles of Plant Pathology	4
NRSC 411—Principles of Soil Fertility	3
NRSC 484—Environmental Plant Physiology	3
PLSC 202—Management of Horticultural Crops, or	
PLSC 271—Plant Propagation, or	
NRSC 203—Plants, Genes and Biodiversity	3
PLSC 453—Weed Science	3

Advanced Production Electives (Select four of the following)

BSCI 497—Insect Pests of Ornamentals and Turf	3
NRSC 4xx—Soils Courses (Minimum of two)	6-8
PLSC 4xx—Crops Courses (Minimum of two)	6-8
PLSC 305—Introduction to Turf Management	3
PLSC 432—Greenhouse Crop Production	3
PLSC 433—Technology of Fruit and Vegetable Crop Production	4
PLSC 452—Principles of Landscape Establishment and Maintenance	3
PLSC 456—Nursery Crop Production	3
PLSC 472—Advanced Plant Propagation	2
PLSC 474—Physiology of Maturation and Storage of Horticultural Crops	3

Total CORE, NRSC and Horticulture and Crop Production Area	104-108
University Electives	12-16

Area C: Landscape Management Requirements

AREC 250—Elements of Agricultural & Resource Economics, or	
ECON 200—Principles of Economics II	3
BMGT 220—Principles of Accounting	3
BMGT 350—Marketing Principles and Organization	3
BSCI 227—Principles of Entomology	4
CHEM 104—Fundamentals of Organic and Biochemistry	4
NRSC 201—Plant Structure and Function	4
NRSC 389—Internship	3
NRSC 410—Principles of Plant Pathology	4
PLSC 161—Graphic Applications for Landscape Management	3
PLSC 200—Land Surveying	2
PLSC 202—Management of Horticultural Crops	4
PLSC 253—Woody Plant Material I	3
PLSC 254—Woody Plant Material II	3
PLSC 255—Landscape Design and Implementation	4
PLSC 261—Computer Applications in Landscape Management	3
PLSC 271—Plant Propagation	3
PLSC 305—Introduction to Turf Management, or	
NRSC 411—Principles of Soil Fertility	3
PLSC 320—Principles of Site Engineering	4
PLSC 321—Landscape Structures and Materials	3
PLSC 452—Principles of Landscape Establishment and Maintenance	3
LARC 160—Introduction to Landscape Architecture	3

Total CORE, NRSC and Landscape Management Area	105
University Electives	15

Area D: Plant Science Requirements

BSCI 227—Principles of Entomology	4
BSCI 442—Plant Physiology, or	
CHEM 113—General Chemistry II	4
CHEM 233—Organic Chemistry I	4
MATH 140—Calculus I, or	
MATH 220—Elementary Calculus I	3
NRSC 201—Plant Structure and Function	4
NRSC 203—Plants, Genes and Biodiversity	3
NRSC 410—Principles of Plant Pathology	4
NRSC 484—Environmental Plant Physiology	3
PHYS 121—Fundamentals of Physics I	4
PLSC 202—Management of Horticultural Crop Production	4
PLSC 271—Plant Propagation	3
PLSC 399—Special Problems in Horticulture	3
PLSC 472—Advanced Plant Propagation	2

Advanced Plant Science Electives (Select one of the following)

PLSC 400—Nurs & Greenhouse Nutrient Mangmnt Planning	3
PLSC 403—Crop Breeding	3
PLSC 432—Greenhouse Crop Production	3
PLSC 433—Technology of Fruit and Vegetable Crop Production	4
PLSC 452—Principles of Landscape Establishment and Maintenance	3
PLSC 456—Nursery Crop Production	3
PLSC 474—Physiology of Maturation and Storage of Horticultural Crops	3

Advanced Science Electives (Select one of the following)

BCHM 261—Elements of Biochemistry, or	
BCHM 461—Biochemistry I	3
BSCI 435—Plant Biochemistry	4
NRSC 411—Principles of Soil Fertility	3
NRSC 417—Soil Hydrology and Physics	3
NRSC 421—Soil Chemistry	4
PHYS 122—Fundamentals of Physics II	3

Total CORE, NRSC and Plant Science Area	101-104
University Electives	16-19

Area E: Turf and Golf Course Management Requirements

BSCI 105—Principles of Biology I	4
BSCI 106—Principles of Biology II	4
BSCI 227—Principles of Entomology	4
CHEM 104—Fundamentals of Organic and Biochemistry	4
COMM 100—Foundations of Oral Communication, or	

COMM 107—Oral Communication: Principles and Practices	3
ENBE 237—Design of Irrigation Systems	1
NRSC 389—Internship	3
NRSC 410—Principles of Plant Pathology	4
NRSC 411—Principles of Soil Fertility	3
NRSC 484—Environmental Plant Physiology	3
PHYS 117—Introduction to Physics, or	
PHYS 121—Fundamentals of Physics I	4
PLSC 305—Introduction to Turf Management	3
PLSC 401—Pest Management Strategies for Turfgrass	3
PLSC 402—Sports Turf Management	3
PLSC 410—Commercial Turf Maintenance and Production	3
PLSC 453—Weed Science	3
Total CORE, NRSC and Turf and Golf Course Management Area	99
University Electives	21

Area F: Urban Forestry Requirements

AREC 240—Introduction to Economics and the Environment	3
BMGT 220—Principles of Accounting I	3
BSCI 227—Principles of Entomology	4
BSCI 497—Insect Pests of Ornamentals & Turf	3
CHEM 104—Fundamentals of Organic and Biochemistry or	
CHEM 113—General Chemistry II	4
LARC 160—Introduction to Landscape Architecture	3
NRSC 201—Plant Structure and Function	4
NRSC 271—Introduction to Forestry and Silviculture	4
NRSC 371—Principles of Arboriculture and Urban Forestry	3
NRSC 389—Internship	3
NRSC 410—Principles of Plant Pathology	4
NRSC 411—Principles of Soil Fertility	3
NRSC 471—Forest Ecology	3
NRSC 472—Capstone - Urban Forest Project Management	3
NRSC 484—Environmental Plant Physiology	3
PLSC 253—Woody Plant Material I	3
PLSC 254—Woody Plant Material II	3
PLSC 261—Applications in Landscape Management	3

Suggested Core Courses and Electives

BIOM 301*—Introduction to Biometrics	3
BSCI 460—Plant Ecology (3) or	
BSCI 460 & 461 (Plant Ecology Lecture and Lab)	5
CHEM 233*—Organic Chemistry I	4
CHEM 243*—Organic Chemistry II	4
COMM 107—Oral Communication: Principles and Practices	3
GEOG 201—Geography of Environmental Systems	3
GEOG 347—Introduction to Biogeography	3
GVPT 170—Introduction to American Government	3
GVPT 273—Introduction to Environmental Politics	3
LARC 450—Environmental Resources	3
MATH 220*—Elementary Calculus I	3
NRMT 460—Principles of Wildlife Management	3
NRMT 461—Urban Wildlife Management	3
NRMT 489B—Field Experience: Park Management	1
NRSC 203—Plants, Genes and Biodiversity	3
NRSC 413—Soil & Water Conservation	3
NRSC 415—Soil Survey and Land Use	3
NRSC 444—Remote Sensing of Agriculture and Natural Resources	3
NRSC 484*—Environmental Plant Physiology	3
PHYS 121*—Fundamentals of Physics I	4
PHYS 122*—Fundamentals of Physics II	4
or the following two semester sequence:	
PHYS 141*—Principles of Physics	4
PHYS 142*—Principles of Physics	4
PLSC 200—Surveying	2
PLSC 320—Principles of Site Engineering	3
SOCY 100—Introduction to Sociology	3
SOCY 105—Introduction to Contemporary Social Problems	3
SOCY 305—Scarcity and Modern Society	3
SPAN 223—United States Latino Culture	3
URSP 100—Challenge of the Cities	3
URSP 320—Planning of the Contemporary City	3
URSP 372—Diversity and the City	3

CORE, NRSC and Urban Forestry Requirements	81
Additional CORE Courses	18
University Electives	21

Fieldwork and Internship Opportunities

Internships with scientists are available at nearby federal and state agencies. Numerous internships also exist and can be readily arranged for students interested in private sector employment.

Student Organizations

The Agronomy Club and the student chapter of the Soil and Water Conservation Society provide students with opportunities for professional activities. The department sponsors student teams that participate in regional and national contests. These teams prepare in the following areas: soil judging, weeds and crops, and landscape contracting.

The Horticulture Club provides students with opportunities to get involved with on-campus activities. The main goals of the club are traveling and seeing a broad perspective of horticulture, as well as being active in the community in environmental and social programs.

Scholarships

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

NUTRITION AND FOOD SCIENCE (NFSC)

College of Agriculture and Natural Resources

3304 Marie Mount Hall, (301) 405-4520

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

Professors: Bean, Castonguay, Lei, Moser-Veillon†
Associate Professors: Jackson, Kantor
Assistant Professors: Giusti, Maghuson, Meng, Sahyoun, Tuttle
Lecturer: Curtis, Klein
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 approved by the Institute of Food Technologists and prepares students for careers in food industry and food safety.

The **Nutritional Science** major emphasizes the physical and biological sciences in relation to nutrition and the development of laboratory skills in these areas. Students in this major frequently elect to go on to graduate or medical school.

Grades. All students are required to earn a grade of C or better in courses applied toward satisfaction of the major. This includes all required courses with a prefix of NFSC, as well as certain required courses in supporting fields. A list of these courses for each program may be obtained from the department office.

136 Operations and Quality Management

Program Requirements

I. Dietetics

a. Major Subject Courses	
NFSC 100—Elements of Nutrition	3
NFSC 112—Food Science and Technology (Spring only)	3
NFSC 250—Science of Food	4
NFSC 315—Nutrition During the Life Cycle (Spring only)	3
NFSC 350—Food Service Operations	5
NFSC 380—Nutritional Assessment (Fall only)	3
NFSC 440—Advanced Human Nutrition	4
NFSC 460—Medical Nutrition Therapy	4
NFSC 470—Community Nutrition (Spring only)	3
NFSC 491—Issues and Problems in Dietetics (Spring only)	3
(CORE capstone)	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
BSCI 105—Principles of Biology I	4
BSCI 230—Cell Biology and Physiology	4
BSCI 440—Mammalian Physiology	4
BSCI 223—General Microbiology	4
SOCY 100—Introduction to Sociology	3
PSYC 100—Introduction to Psychology	3
EDMS 451—Introduction to Educational Statistics OR	
BIOM 301—Introduction to Biometrics	3
BCHM 461—Biochemistry I	3
BCHM 462—Biochemistry II	3
ENGL 101—Introduction to Writing	3
ENGL 393—Technical Writing or ENGL 391—Adv. Composition	3
BMGT 360—Human Resource Management	3
BMGT 364 Management and Organization Theory	3
Additional CORE program courses	18
Restricted Electives	2
Electives	3
Subtotal	85
TOTAL CREDITS	120

II. Food Science

a. Major Subject Courses	
NFSC 100—Elements of Nutrition	3
NFSC 112—Food Science and Technology (Spring only)	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	3
(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	
MATH 113—Elementary Algebra OR	
MATH 115—Precalculus	3
MATH 220—Elementary Calculus I	3
MATH 221—Elementary Calculus II	3
CHEM 103—General Chemistry I	4
CHEM 113—General Chemistry II	4
CHEM 233—Organic Chemistry I	4
CHEM 243—Organic Chemistry II	4
BCHM 461—Biochemistry I	3
BSCI 105—Principles of Biology I	4
ENBE 414—Mechanics of Food Processing	4
BSCI 223—General Microbiology	4
PHYS 121—Fundamentals of Physics I	4
ENGL 101—Introduction to Writing	3
ENGL 393—Technical Writing	3
BIOM 301—Introduction to Biometrics	3
Additional CORE program requirements	24
Restricted electives	3
Electives	6

Subtotal	86
TOTAL CREDITS	120

III. Nutritional Science

a. Major Subject Courses	
NFSC 100—Elements of Nutrition	3
NFSC 112—Food Science and Technology (Spring only)	3
NFSC 315—Nutrition during the Life Cycle (Spring only)	3
NFSC 421—Food Chemistry	3
NFSC 440—Advanced Human Nutrition	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
BSCI 230—Cell Biology and Physiology	4
BSCI 440—Mammalian Physiology	4
PHYS 121—Fundamentals of Physics I	4
BCHM 461—Biochemistry I	3
BCHM 462—Biochemistry II	3
BCHM 464—Biochemistry Laboratory I	2
BCHM 465—Biochemistry III	3
BSCI 223—General Microbiology	4
BIOM 301—Introduction to Biometrics	3
ENGL 101—Introduction to Writing	3
ENGL 393—Technical Writing	3
BSCI 105—Principles of Biology I	4
BSCI 222—Genetics	4
Additional CORE program requirements	24
Restricted electives	3
Electives	5
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) 405-4520.

Student Organizations

The NFSC Department has two active undergraduate clubs: the Food and Nutrition (FAN) club and the Food Science club, which sponsor outreach activities and speakers on career-related topics, and participate in a variety of social activities. Call (301) 405-4520 for more information.

Course Codes: NFSC

OPERATIONS AND QUALITY MANAGEMENT

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

PHILOSOPHY (PHIL)

College of Arts and Humanities

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

Professor and Chair: Carruthers

Professors: Bub, Cherniak, Darden, Greenspan, Horty, Leshner, Levinson, Martin, Pasch (emeritus), Perkins (emeritis), Rey, Slote, Suppe (emeritus), Svenonius, Wallace (part-time)

Associate Professors: Brown, Celarier (emeritus), Lichtenberg, Manekin, Morreau, Odell, Pietroski, Stairs

Assistant Professors: Kerstein, Washington

Affiliate Professors: Brush, Hornstein

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

The Major

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

Requirements for Major

For students matriculating after June 1, 1991:

- (1) a total of 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

Citations

Citation in Cognitive Science

15 credit hours. PHIL 280 and 170 or 271 or 273 and three courses from approved list of courses.

Citation in Philosophy

15 credit hours. PHIL 170, 173, 273 and two courses from approved list of courses.

Citation in Philosophy of Science

15 credit hours. PHIL 250 or 256; 170 or 271 or 273; and three courses from approved list of courses.

Citation in Value Theory

15 credit hours. PHIL 341 or 346 or 440 or 441 or 442 and four courses from approved list of courses.

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

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.infrom.umd.edu/EdRes/Colleges/CMPS/Depts/Physics/Physical_Science/

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

Chair: Einstein
 Astronomy: Deming
 Chemistry: Berkowitz
 Computer Science: Maybury
 Geology: Minarik
 Engineering: Salamanca-Riba
 Mathematics: Wolfe
 Meteorology: Hudson
 Physics: Einstein
 Advisor: Gleason

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 are advised to 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 advisor depends upon the interest of the students. Usually the student will choose to work with one of the committee members representing the discipline the student has selected as the primary area of concentration to satisfy the distributive requirements of the program. Two secondary area advisors are also required.

Curriculum

The curriculum of the Physical Sciences Program has a high degree of flexibility to allow selection of courses to meet the interests and goals of the individual student. To earn a Bachelor of Science degree in the Physical Sciences Program, a student must satisfactorily complete the following requirements:

1. Basic Requirements. Courses are required in four foundational disciplines.
 - a) Chemistry: CHEM 103 and 113 (8 credits)
 - b) Mathematics: MATH 140, 141 and one other math course for which MATH 141 is a prerequisite (11 or 12 credits)
 - c) Physics: PHYS 161, 262, 263 (11 credits) or PHYS 171, 174, 272, 273, 275, 276 (14 credits). Students desiring a strong background in physics should take the 171-276 sequence, which is required of physics majors and offers much smaller classes than the 161-263 sequence.
 - d) Computer Science: CMSC 104 (4 credits) or CMSC 105(3 credits) or CMSC 106 (4 credits) or ENEE 114 (4 credits) or ENEE 241 (3 credits) or ENES 240 (3 credits) or CMSC 114, CMSC 214, and CMSC 250 (12 credits). Students who select Computer Science as an area of concentration must complete CMSC 114, CMSC 214, and CMSC 250.
2. Distributive Requirements. Beyond the basic courses, students complete 24 upper level (300-400) distributive credits. All students must complete 18 of the 24 distributive credits as physical sciences majors. The distributive credits must be divided among three areas of concentration with at least 6 credits in each area. The areas of concentration include the disciplines of chemistry, physics, mathematics (including statistics), astronomy, geology, meteorology, computer science or one of the engineering disciplines. Students who wish to select electrical engineering need the permission of the Assistant Dean in the College of Engineering.
3. General Major Requirements. Programs in the Physical Sciences are usually sequential in nature, and students must be careful to satisfy prerequisites in all cases. Students are advised to develop

a physical sciences curriculum with the help of the Physical Sciences advisors as soon as possible, but preferably by the end of the sophomore year.

- a) All Physical Science students must have a planned program of study approved by the Physical Sciences Committee. In no case shall committee approve a program which has less than 18 credits in the three distributive areas of the Physical Sciences program to be completed, at the time the program is submitted.
 - b) A grade of "C" or better must be earned in all program courses (basic prerequisite and distributive requirement courses).
4. The CORE Liberal Arts and Sciences Studies Program. The requirements of the CORE program are described under the "Academic Regulations and Requirements" section of this catalog. The program requires a total of 43 credits.
 5. Elective Requirements. In addition to meeting the requirements stated above, each physical sciences student must plan a sufficient number of elective courses to meet the minimum 120 credits needed for graduation.

Engineering courses used for one of the options must all be from the same department, e.g., all must be ENG courses or a student may use a combination of courses in ENNU and ENMA, which are both offered by the Department of Materials and Nuclear Engineering; courses offered as engineering sciences, ENES, will be considered as a department for these purposes. Selection of ENEE courses is by Permission Only.

Certain courses offered in the fields included in the program are not suitable for Physical Science majors and cannot count as part of the requirements of the program. These include any courses corresponding to a lower level than the basic courses specified above (e.g. MATH 115), some of the special topics courses designed for non-science students, as well as other courses. A listing of "excluded" courses is on the last page.

Science Journalism Specialization

Science and technology are major and ever-growing forces in our economy, and science related issues are prominent among forefront public-policy issues regularly encountered in the mass media and in the political arena. Thus, there is a great need for journalists with training in science. The Science Journalism specialization offers a broad but rigorous background in science as well as strong journalism training.

1. Basic requirements: same as those stated above.
2. Upper-level Distributive Requirements: Beyond the basic courses, students complete 21 upper level (300-400) distributive credits. All students must complete 18 of the 21 distributive credits as physical sciences majors. The distributive credits must be divided among three areas of concentration with at least 6 credits in each area.

The areas of concentration include the disciplines of chemistry, physics, mathematics (including statistics), astronomy, geology, meteorology, computer science or one of the engineering disciplines. Students who wish to select electrical engineering need the permission of the Assistant Dean in the School of Engineering.

3. In addition, students taking the Science Journalism specialization are required to complete the following lower- and upper-level courses in Journalism: JOUR 201, JOUR 202, JOUR 300, JOUR 320, JOUR 380, JOUR 396, AND JOUR 400. (Alternatively, students interested in broadcast journalism could substitute JOUR 360 for JOUR 320.)
4. The Committee believes that good preparation for Science Journalism in today's world should include a substantial exposure to introductory biology, such as provided in BSCI 105-106; thus, these two courses are strongly recommended. Students should consult early with the PSCI advisor to set up a schedule of courses that includes BSCI 105-106 in a way that proceeds efficiently through the lower-level PSCI requirements while avoiding a semester with 15 credits of science courses or with several courses having time consuming labs and computer projects.
5. The regular University requirements for graduation stated above apply.

Honors Program

The Physical Sciences Honors Program offers students the opportunity for research and independent study, and will lead to a BS degree with Honors or High Honors. The requirements are:

- a) Overall grade point average of 3.0 or better.
- b) Physical Sciences courses grade point average of 3.2 or better.
- c) An independent study course in the Physical Sciences Program - three credit minimum which may be distributed over two semesters (e.g. Astronomy 399 or 498, Chemistry 399, Computer Science 498, Geology 499, Mathematics 498, Meteorology 499 and Physics 399 or 499B).
- d) An honors thesis summarizing independent research submitted to the Physical Sciences Committee.
- e) An oral examination concerning thesis and related subjects. The thesis advisor and two other faculty members (at least one a member of the Physical Sciences Committee) will comprise the examining committee.

Selection of College

Students may elect to receive their degrees from either the College of Computer, Mathematical and Physical Sciences, the College of Agriculture and Natural Resources, or the College of Life Sciences. College of CMPS students have no further requirements to fulfill beyond those stated here plus the General Education Requirements. Agriculture and Natural Resources, and Life Sciences students must also satisfy their respective College requirements.

Approval of Program Plans

All students must submit a program plan outlining what courses they plan to submit towards requirements of the Physical Sciences Program. These should include both the core courses and the distributive 300-400 level courses of 24 credits beyond the core.

In preparing such a program plan, students should keep in mind that the Physical Sciences Committee will look for courses that will support the purpose or goals of the program. These plans should be submitted as early as possible, normally no later than the beginning of the junior year. This is important because it will provide students with sufficient time to plan an appropriate program. The program plans will be approved by the Physical Sciences Committee and filed in the Dean's Office. Any changes to the plan must be approved in writing by the student's advisor and the Chairperson.

Students planning to use any of the special topics, or special programs topics courses (including PHYS 318) as part of their Physical Sciences requirement must obtain written approval to do so. Many of these special topics courses are intended for non-science students and are not suitable for Physical Sciences majors.

In preparing a program plan, students should keep in mind that certain other courses are also not considered suitable for a Physical Sciences major. In particular, courses at lower levels than the core courses designed primarily for non-sciences students may be disallowed. Contact the Program Advisor for specific details.

PHYSICS (PHYS)

College of Computer, Mathematical, and Physical Sciences

1120 Physics Building, (301) 405-5979

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

Professor and Chair: Goodman*

Professors and Associate Chairs: Baden, Chant, Wellstood

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

President Emeritus: Gluckstern

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

Professors: Alley, Anderson, Antonsen, Banerjee, Bhagat, Boyd, Brill, C. C. Chang, Chant, Chen, Cohen, Dorfman*, Dragt*, Drake, Drew, Einstein, Gates (Toll Chair), Goldenbaum, Goodman*, Greenberg, Greene, Griffin,

Hadley, Hamilton, Hassam, Hu, Jacobson, Jawahery, Ji, Kelly, Kim, Kirkpatrick, Korenman, Langenberg, Liu, Lobb*, Mason, Mohapatra*, Paik, Papadopoulos, Park, Pati, Phillips***, Ramesh, Redish, Roos, Roy, Skuja, Venkatesan, Wallace

Professor (part-time): Z. Slawsky

Associate Professors: Anlage, Baden, Beise, Ellis, Eno, Hammer, Lathrop, Sullivan, Wellstood, Yakovenko

Assistant Professors: Becker, Fuhrer, Losert, Luty, Roberts

Affiliated Professors: Panagiotopoulos, Takeuchi

Adjunct Professors: Boldt, Lynn, Mather, Ramaty

Lecturers: Rapport, Restorff, M. Slawsky

*Distinguished Scholar-Teacher

** Distinguished Faculty Research Fellow

*** Nobel Laureate

The Physics Program includes a broad range of undergraduate courses designed to satisfy the needs of almost every student, from the advanced physics major to the person taking a single introductory physics course. In addition, there are various opportunities for personally-directed studies between student and professor, and for undergraduate research. For further information consult "Undergraduate Study in Physics" available from the department. Students majoring in Physics can follow either the Professional Physics area of concentration, the Meteorology Physics area of concentration, or the Education Physics area of concentration. A grade of C or better is required in all courses required for the major.

The Major

Courses required for Physics Major:

Lower-level courses for all areas of concentration	Credit Hours
PHYS 171—Introductory Physics: Mechanics	3
PHYS 174—Physics Laboratory Introduction	1
PHYS 272—Introductory Physics: Fields	3
PHYS 273—Introductory Physics: Waves	3
PHYS 275—Experimental Physics I: Mechanics, Heat, and Fields	2
PHYS 276—Experimental Physics II: Electricity and Magnetism	2
MATH 140—Calculus I	4
MATH 141—Calculus II	4
MATH 241—Calculus III	4
MATH 246—Differential Equations	3
MATH 240—Linear Algebra	4

Upper-level courses for Professional Physics area of concentration	Credit Hours
PHYS 374—Intermediate Theoretical Methods	4
PHYS 375—Experimental Physics III: Electromagnetic Waves, Optics, and Modern Physics	3
PHYS 401—Quantum Physics I	4
PHYS 402—Quantum Physics II	4
PHYS 404—Introduction to Statistical Mechanics	3
PHYS 405—Advanced Experiments	3
PHYS 410—Classical Mechanics	4
PHYS 411—Intermediate Electricity and Magnetism	4

Upper-level and supporting courses for Meteorology Physics area of concentration

CHEM 103—General Chemistry I	4
CHEM 113—General Chemistry II	4
MATH 462—Partial Differential Equations for Scientists and Engineers	3
METO 431—Meteorology for Scientists and Engineers I	3
METO 432—Meteorology for Scientists and Engineers II	3
METO 434—Air Pollution	3
PHYS 375—Experimental Physics III: Electromagnetic Waves, Optics	3
PHYS 401—Quantum Physics I	4
PHYS 402—Quantum Physics II	4
PHYS 404—Introduction to Statistical Thermodynamics	3

[In the Meteorology Physics area of concentration the Physics 401-402 sequence may be replaced by PHYS 420—Principles of Modern Physics (3) and PHYS 406—Optics (3)]

Upper-level and supporting courses for Education Physics area of concentration

EDPL 301—Foundations of Education	3
EDHD 413—Adolescent Development	3
EDHD 426—Cognitive and Motivational Basis of Reading: Reading in Content Area I	3
EDCI 463—Teaching Reading in Content Area II	3
PHYS 374—Intermediate Theoretical Methods	4
PHYS 411—Intermediate Electricity and Magnetism	4
PHYS 401—Quantum Physics I	4
PHYS 375—Experimental Physics III: Electromagnetic Waves, Optics	3

[In the Education Physics area of concentration: EDPL 301 may be replaced by EDPL 401—Educational Technology, Policy and Social Change (3). PHYS 401 may be replaced by PHYS 420—Principles of Modern Physics (3). PHYS 375 may be replaced by one additional non-seminar 400-level approved Physics course of 3-4 credits.]

Students who are considering pursuing the Education Physics area of concentration are encouraged to enroll in EDCI 280—Introduction to Teaching, for a survey of education and teaching. The Education Physics area of concentration is designed to accommodate students obtaining a teaching certificate through the College of Education. However, completing all the courses in the Education Physics area of concentration does not in itself satisfy all requirements for obtaining a teaching certificate. Students pursuing the Education Physics area of concentration who want to also obtain a teaching certificate in secondary education must first apply and be admitted to the Secondary Education Program in the College of Education and then complete additional courses in that program.

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 Biology-Psychology Building, (301) 405-5866

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

Professor and Chair: Hall

Associate Professor and Associate Chair: Plude

Professor, Associate Chair and Director of Graduate Studies: Sigall

Professors: Anderson (emerita), Beidel, Brauth, Carter-Porges*, Cassidy, Collewijn**, Cooling, Dooling, Fein*, Fox*, Gelso, Goldstein, Gollub (emeritus), Hill, Hodos, Horton, Kowler**, Kruglanski, Lissitz*, Locke*, Magoon (emeritus), Martin, McIntire (emeritus), J. Mills, Moss, Nelson, Popper*, Porges*, Rosenfeld*, Schneider, Scholnick, Smith, Steinman, Sternheim, Suomi**, Torney-Purta*, Trickett, Turner, Tyler (emeritus), Waldrop (emeritus), Wallsten, Yeni-Komshian*

Associate Professors: Alexander, R. Brown, Coursey, Freeman*, Hanges, Jekka*, Kim, K. Klein, Larkin, Leone*, Murnane, Norman, O'Brien, O'Grady, Schneiderman*, Stangor, Steele, Yager

Assistant Professors: Blanchard, J. Carter**, Castles**, Dougherty, Fago**, Gelfand, Hazel-Johnson**, Marx**, Miller**, Ployhart, Pompilo**, Reibsame*, Royalty**, Spiefel**, Sprei**, Thompson**, Tipton*, Troyer, Wine**, Zamostny*

*affiliate

**adjunct

The Major

Psychology can be classified as a biological science (Bachelor of Science degree) and a social science (Bachelor of Arts degree) and the department offers academic programs related to both of these fields. The undergraduate curriculum in psychology is an introduction to the methods by which the behavior of humans and other organisms is studied, and to the biological conditions and social factors that influence such behavior. In addition, the undergraduate program is arranged to provide opportunities for learning that will equip qualified students to pursue further study of

140 Psychology

psychology and related fields in graduate and professional schools. Students who are interested in the biological aspects of behavior tend to choose a program leading to the Bachelor of Science degree, while those interested primarily in the impact of social factors on behavior tend to choose the Bachelor of Arts degree. The choice of program is made in consultation with an academic adviser.

Requirements for Major

All students must take at least 35 credits in Psychology including 14 credits at the 400-level. PSYC 386, 478 and 479 may not be included in those 35 required credits. The required courses include PSYC 100, 200 and two laboratory courses chosen from PSYC 401, 410, 420, 433, 440, and 450. In order to assure breadth of coverage, Psychology courses have been divided into four areas. The 35 credit total must include at least two courses from two of the four areas and at least one course from each of the remaining areas. The areas and courses are:

Area I: 206, 301, 310, 401, 402, 403, 404, 410, 415;
Area II: 221, 341, 420, 421, 423, 424, 440, 442, 443, 444;
Area III: 235, 332, 334, 337, 353, 354, 355, 356, 357, 432, 433, 434, 435, 436, 455, 456, 457, 458;
Area IV: 336, 361, 450, 451, 452, 460, 462, 463, 464, 465, 466

In addition, all students must complete (a) either MATH 111, or MATH 140 or MATH 220; (b) one of the following laboratory courses: BSCI 105*, BSCI 106, CHEM 103, or PHYS 121.

*Note BSCI 103, formally BIOL 101/102, does not satisfy the Lab Science requirement for Psychology. If you have completed BSCI 103, you must take BSCI 106, CHEM 103, or PHYS 121.

Students pursuing a Bachelor of Science degree must complete a minimum of 5 courses/17 credits in mathematics and science. At least three courses must be advanced and at least two courses must contain a lab. The 5 course/17 credits must be completed with at least a 2.0 average. MATH 111, MATH 140, MATH 220, BSCI 105, BSCI 106, CHEM 103 and PHYS 121 may be used to satisfy the requirement for the B.S. degree. Students should consult the current Psychology Undergraduate Program Guide for a list of approved advanced Math-Science Courses.

A grade of C or better must be earned in all 35 credits of psychology courses used for the major and all credits used to meet the Math-Science supporting course sequence. No course may be used as a prerequisite unless a grade of C is earned in that course prior to its use as a prerequisite. The prerequisite for any required laboratory course is completion of PSYC 200 and completion of the Math-Science supporting course sequence.

Admission to the Department of Psychology

In accordance with University policy, the Department of Psychology has been designated a Limited Enrollment Program (LEP). All first-time freshman admits who request Psychology will be directly admitted into the major. Other first-time freshman that wish to declare Psychology as a major prior to the end of the schedule adjustment period of the second semester in residence will be allowed to do so.

In order to remain a Psychology major, newly admitted freshman will be required to meet an academic performance review on or before the end of the semester in which they attain (pass) 45 University of Maryland credits. This standard includes:

- Completion of PSYC 100 with a grade of B or better, or, if a student enters with AP or IB credit for PSYC 100, this requirement is replaced by completion of PSYC 221 with a grade of B or better;
- Completion of MATH 111, 140 or 220 with a grade of C or better;
- Completion of BSCI 105, BSCI 106, CHEM 103 or PHYS 121 with a grade of C or better; and
- A minimum cumulative GPA of 2.00.

All other students, including both internal and external transfer students, will not be admitted to the program until they have met the following requirements:

- Completion of PSYC 100 with a grade of B or better, or, if a student enters with AP or IB credit for PSYC 100, this requirement is replaced by completion of PSYC 221 with a grade of B or better;

- Completion of MATH 111, 140 or 220 with a grade of C or better;
- Completion of BSCI 105, BSCI 106, CHEM 103 or PHYS 121 with a grade of C or better; and
- A minimum cumulative GPA based on all previous college-level coursework of 2.70 or higher.

As is the general case for all Limited Enrollment Programs:

- Only one "gateway" or performance review course may be repeated to earn the required grade and that course may be repeated only once;
- Students may apply only once to an LEP, so that students who are directly admitted and fail to meet the performance review criteria will be dismissed from the major and may not reapply; and
- Students must maintain a cumulative GPA of 2.00. Failure to do so will result in dismissal from the major.

The above requirements will go into place for all new students admitted to the University or any Maryland community college after May 2001. They will apply to all students after May 2003, regardless of the date of first admission.

Any student denied admission or dismissed from the major may appeal. Dismissed students appeal directly to the Director of Undergraduate Studies. Internal transfer students appeal to the Office of the Dean for Behavioral and Social Sciences. External transfer students appeal to the Office of Admissions.

Advising

All students can be advised on choice of major, career decisions, research opportunities, graduate school applications, USP/CORE requirements, major requirements, scheduling, and other academic concerns. Advising appointments must be made in person in the undergraduate office, 1107 Biology-Psychology Building. A program guide is available. Call the undergraduate office, (301) 405-5866, or contact Dr. Charles Sternheim, Director of Undergraduate Studies, (301) 405-5241 or by E-mail at cssternheim@psyc.umd.edu for more information.

Student Organizations

Information about the Psychology Honorary Society (Psi Chi) and the Black Psychology Society is posted outside the Undergraduate Psychology Office, 1107 Biology-Psychology Building. All students are welcome to attend the workshops sponsored by these organizations on topics of special interest to undergraduates.

Fieldwork

The department offers a program of fieldwork coordinated with a seminar through PSYC 386. Dr. Robert Coursey, (301) 405-5904, usually administers the course.

Honors

The Psychology Honors Program offers the exceptional student a series of seminars and the opportunity to do independent research under a faculty mentor. To be admitted to the program students must file a formal application and be interviewed by the Director of the Program, Dr. William S. Hall, 1147A Biology-Psychology Building, (301) 405-5788. Students are eligible to enter the program if they are in their fourth to sixth semester of undergraduate work and have completed three courses in Psychology including PSYC 200, and have a 3.3 GPA overall and in Psychology. Students in the University Honors Program may be admitted in their third semester providing that they have (a) earned an A in PSYC 100 or 100H, (b) finished the mathematics prerequisite for PSYC 200 and (c) have an overall GPA and Psychology GPA of at least 3.3. Since there are different graduation requirements including an undergraduate thesis and supporting math and science courses, the student is urged to consult the Guide to the Honors Program in Psychology available in the undergraduate office.

Course Code: PSYC

ROMANCE LANGUAGES PROGRAM

College of Arts and Humanities

3106 Jimenez Hall, (301) 405-4024

Advisory Committee: Falvo (Italian), Little (Spanish), Campagne (French)

The Romance Languages Program is intended for students who wish to

142 Sociology

The Major

Sociology is the scientific study of society and its institutions, organizations, and groups. By observing the broad range of activities in society, and exploring topics such as social class, race, gender, deviance, family, religion, the work place, and demographic trends, sociologists provide important information and perspectives on our social order and the causes and impacts of social change. Sociology provides important information useful both to personal life and public policy decisions. Sociology is among the broadest of the social sciences and is characterized by considerable pluralism in theoretical and methodological approaches, substantive specializations, and in units of analysis.

Students major in Sociology for a variety of reasons. Some emphasize sociology's relevance to understanding a broad range of social issues that interest them for intellectual curiosity, personal life relevance, or usefulness for ameliorative social change efforts. Other majors emphasize acquisition of sociological knowledge and skills useful in a variety of career paths where understanding societal problems and trends, group dynamics, and personnel issues are critical. For a small core of majors, the purpose of the undergraduate program is preparation and training for admissions to graduate programs and eventual careers as sociologists in teaching, research and/or policy development. Other majors use sociology as a basis for graduate study in related fields, including law, social work, public policy, and human resource management.

Goals and Objectives of the Undergraduate Sociology Program

The overall goals of the program are:

- To provide meaningful and challenging courses within the University CORE program
- To provide meaningful and challenging courses as electives for non-majors
- To provide a coherent program of courses for Sociology majors which enables majors to attain:
 - a) general sociological knowledge and understanding of our society;
 - b) sociological knowledge and skills relevant to a variety of career paths,
 - c) sociological knowledge and skills relevant to application to and success within competitive sociology graduate programs and careers; and
- To provide a Sociology Honors component for selected students who have the capability and motivation to work at the most challenging level.

The program attempts to provide students the opportunity and ability to meet the following objectives:

- To read and think critically and to assess information about our society in terms of sociological concepts and a social science model of argument
- To understand the key questions addressed by the discipline, and to be able to identify both similarities and contrasts with other disciplines
- To be familiar with basic sociological information about our society and its place in the international order
- To be acquainted with the role of theory in the construction of sociological inquiry; for majors this entails knowing the central ideas of major classical and contemporary theorists
- To understand the social science model of evidence and argument: for majors this entails familiarity with basic social statistics techniques, basic methods of data collection, basic techniques of organizing and presenting information, and the ability to carry out a small research project.

Requirements for Major

As part of the 120 credits and other requirements for a Bachelor of Arts degree, sociology majors must complete a minimum of 38 credits in Sociology and 12 credits in supporting courses outside of Sociology. All these credits must be completed with a minimum grade of C or better in each course. The 38 credits in Sociology must include the following:

- 1) four basic courses required of all majors: SOCY100 (3); SOCY201 (4); SOCY202 (4); and SOCY203 (3)
- 2)

Student Organizations

The Sociology Collective, open to all Sociology majors, is organized by a group of interested undergraduates to fill student needs within the Sociology community. The Collective provides information about topics of interest, including department activities, career planning, and relevant changes within the university, and strives to enhance the sense of community within the department. Representatives of the Collective participate in many faculty committees within the department and thereby provide the undergraduate perspective on policy issues.

Alpha Kappa Delta is the National Honor Society for Sociology majors. Membership is based on Sociology GPA (3.0 minimum) and overall GPA (3.0 minimum). Students may apply after they have completed 18 hours of Sociology course work. This organization's activities focus on providing tutoring services for undergraduates in core courses.

Survey Research Center
1103 Art-Sociology Building, 314-7831
Director: Stanley Presser

The Survey Research Center specializes in the design and conduct of both mail and telephone surveys. It supports undergraduate and graduate education by providing both technical training and practical experience to students.

Areas of Specialization

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

Associate Professor and Acting Chair: Lavine

Associate Chair: Benito-Vessels

Professor emerita: Nemes

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

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

Assistant Professors: Bouvier, Cabal-Krastel, Lacorte, Rodriguez, Sánchez

Instructors: Canabal, 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.

Changes in requirements are under review.

Language and Literature Major

Courses: SPAN 207, 221, 301-302, 311 or 312, 321-322 or 323-324, 325-326 or 346-347; plus four courses in literature at the 400-level; one course may be taken in Luzo-Brazilian literature, for a total of 39 credits. Nine credits of supporting courses, six of which must be at the 300- or 400-level in a single area other than Spanish, for a combined total of 48 credits. Suggested areas: art, comparative literature, government and politics, history, philosophy, and Portuguese.

Foreign Area Major

Courses: SPAN 207; 301-302; 311 or 312; 315 and 415 or 316 and 317; 321-322 or 323-324; 325-326 or 346-347, plus three courses in literature at the 400-level; one course may be taken in Luzo-Brazilian literature, for a total of 39 credits. Nine credits of supporting courses, six of which must be at the 300— or 400-level in a single area other than Spanish, for a combined total of 48 credits. Suggested areas: anthropology, economics, geography, government and politics, history, Portuguese, and sociology.

Translation Option

Courses: SPAN 207; 301-302, 311 or 312; 316 and 317; two courses from 318, 356, 357, 416, 417; 321-322 or 323-324; one course from 325, 326, 346, 347; plus two courses in literature at the 400-level; one course may be taken in Luzo-Brazilian literature, for a total of 39 credits. Nine credits of supporting courses, six of which must be at the 300- or 400-level in a single area other than Spanish, for a combined total of 48 credits. Suggested areas: art, comparative literature, government and politics, history, philosophy, and Portuguese.

Business Option*

Courses: SPAN 207; 211; 301-302; 311 or 312; 315 and 415; 316 and 317; 325-326 or 346-347; 422, for a total of 36 credits. Twelve credits of supporting courses, six of which must be at the 300— or 400—level in a single area other than Spanish. Suggested areas: business and management, economics, government and politics, history and geography.

Students interested in majoring in a combination of two Romance languages should see the description of the Romance Languages Program, above.

*A double major program, Business, Language, and Cultures, combines International Business and Spanish.

Citations

Citations in Spanish Language and Cultures

15 credit hours. Five courses in Spanish from an approved list of courses. Courses taken through Study Abroad programs may be applied. Contact the Director of Undergraduate Studies for more information.

Citation in Portuguese Languages and Cultures

15 credit hours. PORT 205, 231 and three courses from approved list of courses. Contact the Director of Undergraduate Studies for more information.

Citation in Business Management for Spanish Majors (1105B)

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

Citation in Business Spanish

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

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

144 Special Education

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.education.umd.edu/EDSP/>

Professor and Chair: Burke

Professors: Beckman, Egel, Graham, Harris, Hebel (emeritus), Leone, Lieber, Moon, Speece

Associate Professors: Cooper, Kohl, Neubert

Assistant Professors: Maccini, Malmgren

Associate Director: McLaughlin

Research Associates: Case, Davis, Florian, Greig, Gruber, Kelly, Meisel, Page-Voth

Undergraduate Coordinator: Molloy

Lecturers: Aiello, Danehy, Fink, Hudak, Long, Simon, Thanhouer, Waranch
Faculty Research Assistants: Barnwell, Brown, Cohen, Drakeford, Grigal, Newcomb, Rhim, Stepanek, Wayne, Young

The Special Education Department offers an innovative and rigorous undergraduate program which prepares teachers of infants, children, or young adults with disabilities. This program has been nationally recognized for many of its exemplary features. It is a five-year (10-semester, 150-credit hour) professional certification program which graduates students with a Bachelor of Science degree in special education with full special education teacher certification in the State of Maryland and certification reciprocity in 39 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 foundation special education courses and

practicum experiences during the third year (Semesters V and VI). These courses provide the student with a solid foundation in theory and practice related to the education of all children with disabilities across a wide range of ages.

Students work directly with children or youth with disabilities during each semester, leading up to student teaching during the last semester.

Combined Bachelor's/Master's Program

Selected undergraduate students majoring in special education will be eligible for dual application of credit to both the bachelor's and master's degrees. A student desiring graduate credit should apply for admission to the Graduate School during the last semester of the fourth year. If admitted to the Graduate School, the student may select up to 12 credits (four courses) of specified course work from the fifth year of the undergraduate program to be applied simultaneously toward the credits required for the master's degree in special education at the University of Maryland. The selected courses may not include field practica or student teaching experiences. Students will be expected to fulfill supplemental requirements in the selected courses. To complete the master's degree, students must fulfill all Graduate School requirements for the degree, with the exception of the selected 400-level courses.

Admission

Prior to formal acceptance as a special education major, all students are required to enroll in a special education introductory course (EDSP 210) which provides a survey of the history and current issues in special education. Upon successful completion of the introductory course and 45 semester hours of requirements, students apply for formal admission to 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)
- *EDHD Elective (See Department for approved list.)

[EDSP Undergraduate Catalog Revisions, 2001-2002]

Professional Courses

- *EDSP 210—Introduction to Special Education (3)
- EDCI 397—Principles and Methods of Teaching in Elementary Schools (3) OR
- EDCI 390—Principles and Methods of Secondary Education (3)
- EDSP 410—Behavior and Classroom Management in Special Education (3)
- EDSP 415—Field Placement I: Special Education (1)
- EDHD 425—Language Development and Reading Acquisition (3)
- EDSP 403—Instruction of Students with Physical Disabilities (3)
- EDSP 412—Assessment in Special Education (3)
- EDSP 414—Reading and Writing Instruction in Special Education I (3)
- EDSP 417—Field Placement II: Special Education (3)
- EDPA 301—Foundations of Education (3)

Specialty Area Requirements

The Early Childhood Special Education Option

- EDSP 400—Functional Assessment & Instruction in Special Education (3)
- EDSP 484—Reading and Writing Instruction in Special Education II (3)
- EDSP 420—Characteristics of Infants & Young Children: Early Childhood Special Education (3)
- EDSP 421—Field Placement III: Early Childhood Special Education (4)
- EDSP 423—Assessment in Early Childhood Special Education (3)
- EDSP 430—Early Intervention: Early Childhood Special Education (3)
- EDSP 424—Field Placement IV: Early Childhood Special Education (4)
- Major Elective (see Department for approved list) (3)
- EDSP 422—Curriculum and Instruction: Early Childhood Special Education (3)
- EDSP 487—Family Partnerships in Special Education (3)
- EDSP 404—Education of Students with Autism (3)
- EDSP 431—Field Placement V: Early Childhood Special Education (4)
- EDSP 490—Capstone Seminar in Special Education (3)
- EDSP 494—Internship: Early Childhood Special Education (11)

The Elementary Special Education Option

- EDSP 400—Functional Assessment & Instruction in Special Education (3)
- EDSP 484—Reading and Writing Instruction in Special Education II (3)
- EDSP 451—Curriculum & Instruction: Elementary Special Education (3)
- EDSP 452—Field Placement III: Elementary Special Education (4)
- EDSP410—Community-Based Assessment & Curriculum in Special Education (3)
- EDSP453—Methods & Models of Instruction: Elementary Special Education (3)
- EDSP 485—Assessment and Instruction in Mathematics in Special Education (3)
- EDSP 454—Field Placement IV: Elementary Special Education (4)
- EDSP 487—Family Partnerships in Special Education (3)
- EDSP 455—Assessment in Elementary Special Education (3)
- EDSP 486—Promoting Prosocial Behavior in Special Education (3)
- EDSP 456—Field Placement V: Elementary Special Education (4)
- EDSP 490—Capstone Seminar in Special Education (3)
- EDSP 495—Internship: Elementary Special Education (11)

The Secondary/Middle Special Education Option

- EDSP 400—Functional Assessment & Instruction in Special Education (3)
- EDSP 466—Issues and Models: Secondary/Middle Special Education (3)
- EDHD 426—Cognition and Motivation in Reading: Reading in Content Areas I (3)

- EDSP 434—Field Placement III: Secondary/Middle Special Education (4)
- EDSP410—Community-Based Assessment & Curriculum in Special Education (3)
- EDSP 474—Assessment in Secondary/ Middle Special Education (3)
- EDCI 463—Reading in Secondary School (3)
- EDSP 485—Assessment and Instruction in Mathematics in Special Education (3)
- EDSP 435—Field Placement IV: Secondary/Middle Special Education (4)
- EDSP 477—Curriculum, Assessment, & Instruction in Secondary/Middle Special Education (3)
- EDSP 487—Family Partnerships in Special Education (3)
- EDSP 486—Promoting Prosocial Behavior in Special Education (3)
- EDSP 436—Field Placement V: Secondary/Middle Special Education (4)
- EDSP 490—Capstone Seminar in Special Education (3)
- EDSP 496—Internship: Secondary/Middle Special Education (11)

Course Code: EDSP

SPEECH COMMUNICATION

The Department of Speech Communication is now the Department of Communication. See entry on page 96.

STATISTICS

For information consult the entry under Mathematical Statistics Program, page 129.

THEATRE (THET)

College of Arts and Humanities

2809 Clarice Smith Performing Arts Center, (301) 405-6676

E-mail: thetdept@umdacc.umd.edu

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

Chair: Hildy

Professors: Hildy, Meersman

Associate Professors: Conway, Coustaut, Hébert, Huang, Patterson, Reese, Schuler, Wagner

Assistant Professors: Burbank, Cabot, Nathans

Instructors: Alford, Kriebs

Emeritus: Gillespie, Pugliese

The Major

Small classes, student-faculty town meetings, and a close knit departmental environment promote a strong sense of community within the Department of Theatre. It is a lively, multi-cultural community where the contributions of all are valued. An extensive schedule of departmental and student productions offer students myriad opportunities to practice their craft. The department is a supportive and stimulating environment that fosters students' creative development and spurs their achievements. A well-rounded and comprehensive curriculum prepares for careers in acting, directing, design, technical theatre, theatre management, and teaching. Since the skills cultivated by a liberal arts approach to theatre study—self-discipline, creativity, self-confidence, and critical thinking—are valuable in all career fields, theatre training is an excellent preparation for any profession. Our performance, design, and technical theatre faculty are active in professional as well as academic theatre—members of Actors Equity and United Scenic Artists—providing students a vital link to the world of professional theatre. Our history, criticism, and theory faculty regularly publish and participate at national and international conferences. Situated in close proximity to the vibrant and stimulating professional theatre world of Washington, D.C. and Baltimore, students have ready access to the best of both contemporary and classical productions. They enjoy a unique opportunity to participate in this busy theatrical region through internships and other projects. The Department of Theatre is home to The National Players, which offers audition opportunities to our graduates. Now in its 51st season, National Players is America's longest-running classical touring company, performing and conducting workshops across the country. The Clarice Smith Performing Arts Center is the largest facility of its kind on any university campus in the nation. The Center features six state-of-the-art performing venues including a 650 seat proscenium theatre and 100 and 200 seat experimental theatres. In addition, the center houses the Department of Dance, School of Music, and a Performing Arts Library.

146 Women's Studies

The department offers two tracks leading to the B.A. in Theatre. Both share a common core of classwork, which provides a solid liberal arts grounding. The Performance Track is an intensive training in acting, vocal production, movement, and directing. The Design/Technical Track encompasses a comprehensive study in scene design, costume design, lighting design, sound design, stage management, and technical direction. In cooperation with the Department of Curriculum and Instruction, a selective admission program for teacher certification in Theatre/English Education is available. For more information, see an advisor in EDU 2311.

Requirements for Major

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

Major requirements are 43 credits of course work in theatre, exclusive of those courses taken to satisfy the college and university requirements, plus 10-12 credits of supporting area courses. Of the 43 credits, at least 21 must be upper-level (300-400 series). No course with a grade less than C may be used to satisfy major or supporting area requirements.

Required core courses for all majors (31 credits): THET 110, 111, 120, 170, 171, 279, 330, 475, 479, 490, 491.

Design Emphasis (12 credits): THET 273, 373 required. Choose two of the following: 371, 377, 383.

Performance Emphasis (12 credits): THET 221*, 320*, 387. Choose one of the following: 420*, 430, 474.

*An audition is required for these courses.

Supporting courses (10-12 credits): Two from each of the following: ENGL 304, 403, 404, 434, 450, 451, 452, 454; 4-6 credits from any DANC, MUSC, ARTH, or ARTT course approved by the departmental advisor.

Advising

Advising is mandatory for undergraduate theatre majors. Students should 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 prospective and enrolled students through a number of Creative and Performing Arts Scholarships and Theatre Patrons Scholarships. Other scholarships and workshops are awarded yearly to continuing students. For further information, contact the Coordinator of the Scholarship Program or visit our web site at <http://www.inform.umd.edu/THET>.

Course Code: THET

WOMEN'S STUDIES (WMST)

College of Arts and Humanities

2101 Woods Hall, 405-6877

Professor and Chair: Moses

Professors: Beck, Bolles, Dill, Rosenfelt, Zambrana

Associate Professors: Barkely Brown, Kim, King

Affiliate Professors: Harley, Wilson (Afro-American Studies); Parks, Sles, Struna (American Studies); Friedenber, Paolisso (Anthropology); Withers (Art History); Kerkham, Liu (Asian and East European Language and Culture); Palmer (Biology); Greer (Chemical Engineering); Doherty, Hallet, Stehle (Classics); Aldoory, Grunig, Parry-Giles (Communication); Collins, Fuegi, Lanser, Peterson (Comparative Literature); Fassinger (Counseling and Personnel Services); Coletti, Donawerth, Kauffman, Kornblatt, Leonardi, Lindemann, Logan, Ray, Smith, Washington (English); Leslie (Family Studies); Letzter, Mossman (French and Italian Languages and Literature); Frederickson, Oster, Strauch (Germanic Studies); Bedos-Rezak, Brush, Gullickson, Lyons, Muncy, Zilfi (History); Beasley (Journalism); Day, Luckert, Masnick (Library Services); Robertson (Music); Fullinwider, Li (Philosophy and Public Policy); O'Brien, Scholnick (Psychology); Bianchi, DeRose, Desai, Hunt, Milkie, Moghadam, Presser, Segal (Sociology); Bouvier, Cypess, Rodriguez (Spanish and Portuguese Languages and Literature); Coustaut, Schuler (Theatre)

The Women's Studies Program is an interdisciplinary academic program designed to examine the historical contributions made by women, reexamine and reinterpret existing data about women, and introduce students to the methodology of feminist scholarship. The program offers interdisciplinary courses on women, encourages the offering of 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 fifty courses, many of which are cross-listed with other academic units, students will have the opportunity to design an emphasis within the major relevant to their special interests. 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 credit must be at or above the 300 level. No course with a grade less than C may be used to satisfy the major. Students will design their programs in consultation with a Women's studies advisor. 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 & Culture (3)
- WMST 300—Feminist Reconceptualizations (3)
- WMST 350—Feminist Education Practicum and Analysis (6)
OR
- WMST 380—Women's Studies Field Work and Analysis (6)
- WMST 400—Theories of Feminism (3)
- WMST 488—Senior Seminar (3)

2. Distributive Courses (9 credit hours)

Area 1: Arts and Literature

- WMST 241—Women Writers of French Expression in Translation (X-listed as FREN 241) (3)
- WMST 250—Introduction to Women's Studies:
Women, Art, and Culture (3)
- WMST 255—Introduction to Literature by Women
(X-listed as ENGL 255) (3)
- WMST 275—World Literature by Women (X-listed as CMLT 275) (3)
- WMST 281—Women in German Literature and Society
(X-listed as GERM 281) (3)
- WMST 348—Literary Works by Women (3)
- WMST 408—Special Topics in Literature by Women
before 1800 (X-listed as ENGL 408) (3)
- WMST 444—Feminist Critical Theory (X-listed as ENGL 444) (3)
- WMST 448—Special Topics in Literature by Women of Color*
(X-listed as ENGL 448) (3)
- WMST 458—Special Topics in Literature by Women after 1800
(X-listed as ENGL 458) (3)
- WMST 466—Feminist Perspective on Women in Art
(X-listed as ARTH 466) (3)
- WMST 468—Feminist Cultural Studies (3)
- WMST 481—Femmes Fatales and the Representation
of Violence in Literature (X-listed as FREN) (3)
- WMST 496—African-American Women Filmmakers*
(X-listed as THET 496)
- FREN 482—Gender and Ethnicity in Modern French Literature (3)

Area II: Historical Perspectives

- WMST 210—Women in America to 1880 (X-listed as HIST 210) (3)
- WMST 211—Women in America Since 1880 (X-listed as HIST 211) ... (3)
- WMST 212—Women in Western Europe, 1750-present
(X-listed as HIST 212) (3)
- WMST 320—Women in Classical Antiquity (X-listed as CLAS 320)
- WMST 453—Victorian Women in England, France, and the
United States (X-listed as HIST 493) (3)
- WMST 454—Women in Africa * (X-listed as HIST 494) (3)
- WMST 455—Women in Medieval Culture and Society
(X-listed as HIST 495) (3)

WMST 457—Changing Perceptions of Gender in the US: 1880-1935 (X-listed as HIST 433)	(3)
WMST 492—History of the American Sportswoman: Institutions and Issues (X-listed as KNES 492)	(3)
AASP 498W—Black Women in United States History*	(3)
AMST 418J—Women and Family in American Life	(3)
HIST 309—Proseminar in Historical Writing: Women's History	(3)
HIST 319Z—Special topics in History: Women in the Middle East*	(3)

Area III: Social and Natural Sciences

WMST 200—Introduction to Women's Studies: Women and Society	
WMST 313—Women and Science (X-listed as ZOOL 313)	(3)
WMST 325—Sociology of Gender (X-listed as SOCY 325)	(3)
WMST 326—Biology of Reproduction (X-listed as ZOOL 326)	
WMST 336—Psychology of Women (X-listed as ZOOL 326)	(3)
WMST 360—Caribbean Women*	(3)
WMST 410—Women in the African Diaspora*	(3)
WMST 420—Asian-American Women*	(3)
WMST 425—Gender Roles and Social Institutions	(3)
WMST 430—Gender Issues in Families (X-listed as FMST 430)	(3)
WMST 436—Legal Status of Women (X-listed as GVPT 436)	(3)
WMST 452—Women and the Media (X-listed as JOUR 452)	(3)
WMST 471—Women's Health (X-listed as HLTH 471)	(3)
WMST 493—Jewish Women in International Perspective*	(3)
WMST 494—Lesbian Communities and Difference*	(3)
AASP 498F—Special Topics in Black Culture: Women and Work*	(3)
CCJS 498—Special Topics in Criminology and Criminal Justice: Women and Crime	(3)
COMM 324—Communication and Gender	(3)
SOCY 498W—Special Topics in Sociology: Women in the Military	(3)
*Fulfills Women's Studies Multi-Cultural Requirement	

3. Courses in Cultural Diversity

Students will select two courses for a minimum of 6 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 advisor, will design an emphasis consisting of at least three courses or nine semester credit hours. Courses in this category may overlap with other requirement. Courses will ordinarily be drawn from those approved for the major. In some instances, students may secure permission from the Women's Studies advisor to include other courses.

5. Electives

Students should select their elective from the full list of courses for the major. The number of credit hours will vary depending on the individual student's program, but should bring the total number of semester credit hours to at least 39.

Honors

The Honors Program is designed to give students the opportunity to pursue rigorous interdisciplinary research and writing. Interested students who have a GPA of at least 3.0 should apply 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 Advisor 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 Undergraduate Academic Advisor, Women's Studies Program, 2101 Woods Hall, University of Maryland, College Park, Maryland 20742, (301) 405-6827.

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: Barlow, Christ, Klose

Staff: Condon, 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.

Additional information may be obtained by telephoning the Office of Aerospace Studies, (301) 314-3242.

Four-Year Program

This program is composed of a General Military Course (GMC) and a Professional Officer Course (POC). The first two years (GMC), normally for freshmen and sophomores, give a general introduction to the Air Force and the various career fields. Students enrolled in the GMC program incur no obligation and may elect to discontinue the program at any time. The final two years (POC) concentrate on the development of leadership skills and the study of United States defense policy. Students must compete for acceptance into the POC. Students enrolled in the last two years of the program are eligible for an AFROTC scholarship.

Students in the four-year program who successfully complete the first two years of the program and are accepted into the POC program must attend four weeks of field training at a designated Air Force base during the summer after completing their sophomore year of college.

Two-Year Program

This program is normally offered to prospective juniors but may be taken by seniors and graduate students. The academic requirements for this program are identical to the final two years of the four-year program and students are eligible to receive the same benefits. During the summer preceding entry into the program, all candidates must attend 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.

148 Study Abroad Programs

General Requirements for Acceptance into the POC

The student must complete the General Military Course and the field training session, pass the Air Force Officer Qualifying Test, be physically qualified, be in good academic standing, meet age requirements and be a U.S. citizen. Successful completion of the Professional Officer Course and a bachelor's degree or higher are prerequisites for a commission as a Second Lieutenant in the United States Air Force.

Scholarships

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 a minimum of \$200.

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. Students may 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 or in flats with other program participants. Fall and spring semester, or year.

Study in Nice, France: Offers French language courses for foreigners at the University of Nice. Students also take a course with the Maryland Resident Director. Year or spring semester.

Study In Mexico City: Offers Spanish language and Latin American studies courses. Fall semester.

Study in Alcalá, Spain: Offers Spanish language and culture studies at the University of Alcalá de Henares. Students may enroll in an internship or in a course in Spanish literature, business, or civilization. Spring semester.

Study in 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. Spring semester.

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. The program is administered by Towson University. Fall and spring semesters.

Study in Brazil: Students take a preparatory language and culture course in the summer and then enroll in regular university courses offered in Portuguese at the Catholic University of Rio de Janeiro.

Denmark's International Study Program: Maryland acts as a coordinator for DIS in Copenhagen, which offers courses in English focusing on humanities and social sciences, international business, marine biology, environmental studies, early multi-cultural education, and medical practice and policy. Fall and spring semesters, or year.

German and Engineering: As a part of the dual degree program, students spend six months in Germany studying the language and completing an internship with an engineering company. A two-month, intensive technical German language study is followed by a four month paid internship in Germany. Spring semester.

Winterterm

New and exciting programs are offered every year. At the time of printing, Winterterm 2002 programs were being developed. In 2001, the following programs were offered:

Belize: Mayan Culture and the Interface between Tropical Rainforests and Coral Reefs: This course introduces students to present-day archaeological sites that have been discovered recently and are some of the major sites of Mayan culture. In a second segment, participants explore the tropical environment of Belize.

Brazil: Afro-Brazilian Culture: This intensive three-week course will introduce students to the African diaspora culture and language in Brazil with emphases on Salvador and Northeast Brazil. The program focuses on both historical and present day culture and language, with emphases on religion, dance, music, literature, and theater.

Costa Rica: Sustainable Tropical Ecosystems: This course provides students with the opportunity to explore a variety of ecosystems in Costa Rica and to understand economic and environmental resource issues. Participants explore the environmental consequences of agricultural development and the concepts of ecotourism and agro-ecotourism.

Cuba: Social Change in Cuba: In Havana and Santiago, students will gain insights into the character of organizations providing social services in Cuba and to evaluate the current opportunities and constraints for political and social participation.

Germany and the European Union: Politics, Business, and Society: This course focuses on the impact of history and culture on European and German politics and business. Students also explore the rise of the European Union's economic, political, and social institutions.

Italy: Greek and Roman Explorations: This course explores on-site the classical roots of many cultures in the world. Students will study the preserved ancient cities of Velia, Paestum, Stabiae, and Pompeii. Students will also explore the culture of Rome.

Mexico: Doing Business in Mexico: Economic and Cultural Factors: Students will study issues and opportunities pertaining to Mexico's participation in the New Economy. The study program includes trips to Mexico City, Taxco, and Xochicalco.

Vietnam: Foreign Policy and Society in Transition: The course is designed to immerse students in the political, cultural, and economic life of contemporary Vietnam. Globalization, multilateralism, gender relations and their impacts, especially on Vietnam's youth culture, are the academic focuses of the course.

Summer Programs

New and exciting programs are offered every year. In 2001, the following programs are offered:

Architecture Abroad: The School of Architecture sponsors various summer study programs in Europe and the developing world which allow students at an advanced undergraduate and graduate level to deal creatively with architectural issues in a foreign environment.

Ename, Belgium: This intensive course will explore the archaeological and historic heritage of Flanders. Students will participate in the uncovering and analysis of medieval settlements, churches, and monasteries. Participants will also explore the effects of visitors and tourism on historic buildings, urban development, and the local population.

Costa Rica: This ten-week course offers students the opportunity to live and work in a developing region of Costa Rica while studying a multi-disciplinary program of architecture, planning, resource management, international development, and women's issues.

Kiplin, England: This honors program offers a survey of British history, culture, and literature at Kiplin Hall. Students participate in seminars and take excursions to London, Bath, Oxford, and Greenwich.

London, England: The course explores how Caribbean writers conceptualize home in contemporary Britain, with particular focus on the London experience. Discussions will also emphasize the sociological and political contexts of the Caribbean community in Britain. Participants choose a research topic focusing on the experience of Caribbean people in Britain.

Oxford, England: The three-week program offers students an in-depth look at British law, politics, and society. Students will take two course modules: one required course in "Law and Society" and one course focusing on British politics or contemporary British society.

Summer in Germany: The Department of Germanic Studies sponsors an intensive language and culture program in Tübingen, Germany.

Summer in Taxco, Mexico: The Department of Spanish and Portuguese sponsors an intensive Spanish language program for students at the elementary and intermediate levels.

South Africa: This course focuses on three phases of the South African post-independence period and includes discussion and field trips to meet with current political leaders and non-governmental agencies.

Summer in Spain: The Department of Spanish and Portuguese sponsors an intensive language and culture program in Spain. Students actively participate in academic courses and take excursions throughout Madrid and San Roque and the surrounding countryside.

UK: This program focuses on the study of rural and urban landscapes in England and Scotland. The course includes a survey of towns and villages, country estates, and city parks and gardens in the context of their natural and cultural setting.

Exchanges

The Study Abroad Office administers reciprocal exchanges with specific universities in the U.K., Japan, Korea, Germany, Austria, and Sweden. These exchanges are often related to academic departments and require extensive language or academic background. All the exchanges require at least a 3.0 grade point average.

Exchanges are available with the following British universities: King's College for engineering and physics majors; University of Kent for government and politics majors; Kingston University for chemistry majors; University of Sheffield for English majors and American studies majors; University of Lancaster for math and other majors; University of Bristol for philosophy majors; University of Surrey for sociology majors; University of Keele for criminology and other majors; and University of Liverpool for history majors.

In Japan, students may study intensive Japanese language at Keio University, and may study humanities, social sciences, and sciences and engineering at Hiroshima and Chiba universities. In Korea, students attend Yonsei University. In Germany, exchanges are available with the University of Tübingen and the Gesamthochschule Kassel. In Austria, students attend the University of Vienna. In Sweden, exchange opportunities are available at Uppsala University.

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. Beginning fall 2001, Honors juniors and seniors may apply for its "Beyond the Classroom" program to live in apartment-style housing in South Campus Commons.

Qualified first-year entering students are invited into Honors; transfer students with between 12 and 30 credits (excluding AP credits) will be considered for admission. Transfer students with more than 30 credits transferring from an Honors program in their previous school should contact the University Honors Program for information about campus Honors opportunities. Most departmental and college Honors programs begin in the junior year. Please contact departments or colleges directly for admission requirements.

For more information, write Director, University Honors Program, Anne Arundel Hall, University of Maryland, College Park, Md., 20742, or call 301-405-6771.

Gemstone

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. Admission is by invitation. Upon admission to the program, College Park Scholars choose one of the multidisciplinary academic programs as a focus, and have an opportunity to live together with other students in that program in specially designated Scholars' residence halls. For Fall 2001, 12 programs are available:

150 Pre-Professional Programs

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

All students are welcome to use the Law and Health Professions Resource Room in 0110 Hornbake for information on careers and professional schools across the country.

Pre-Dental Hygiene

Advisor: Chris Mays

Please read the General Information concerning pre-professional programs under the Pre-Professional Programs subcategory.

The Pre-Dental Hygiene program is designed to prepare students for entrance into a professional curriculum for Dental Hygiene at institutions that offer Bachelor of Science in Dental Hygiene programs. **Pre-Dental Hygiene is not intended as a Pre-Dental major.** Pre-Dental Hygiene is not a degree-granting program at the University of Maryland, College Park.

A Baccalaureate degree program for a Bachelor's of Science in Dental Hygiene (BS-DH) follows a 2+2 model program. Students may complete two years of prerequisite courses at the University of Maryland, College Park, and then apply for admission into a professional school to complete two years of professional coursework, which includes classroom, laboratory, and clinical education.

University of Maryland students also have the option of completing a four-year degree at College Park in their selected major, in addition to completing dental hygiene prerequisites. This is the 4+2 model program. In this case, students who complete degree requirements in their chosen major as well as the pre-dental hygiene prerequisites, would have a degree from the University of Maryland, College Park in their chosen major in addition to the professional school prerequisites necessary for entrance into a professional dental hygiene program. Upon completion of a professional dental hygiene program, the student would be conferred a Bachelor's of Science in Dental Hygiene degree from said program.

Popular majors for students interested in dental hygiene include biology, health, and nutrition and food science. However, any major is suitable as long as all prerequisite courses are completed. The Health Professions advisors will assist students in making an appropriate major selection.

Prerequisites of professional schools are subject to change; therefore, students are strongly encouraged to contact professional programs for the most current requirements. Contact the American Dental Hygienists' Association or the American Dental Association for specific information about individual BS-DH program prerequisites. Students may also visit the Health Professions resource library in 0110 Hornbake for professional school information. Admission to professional schools is competitive and is not guaranteed by the University of Maryland, College Park. Note: The University of Maryland at Baltimore offers a professional-level dental hygiene program.

American Dental Hygienists' Association
444 N. Michigan Avenue, Suite 3400
Chicago, IL 60601
<http://www.adha.org>

American Dental Association
211 E. Chicago Avenue
Chicago, IL 60611-2678
<http://www.ada.org>

Some prerequisite courses usually required by most professional phase Dental Hygiene programs include, but are not limited to:

- General Biology
- Human Anatomy and Physiology
- Inorganic and Organic Chemistry
- Microbiology
- Principles of Nutrition
- Public Speaking

152 Pre-Professional Programs

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

Advisor: Tiffanee L. Dykes

Most law schools require applicants to have received a Bachelor's degree; however, in some cases law schools will consider truly outstanding applicants with only three years of academic work. Law schools generally do not require prerequisite courses for admission into their programs, but do require that the student follow one of the standard programs offered at their undergraduate institution. Law schools require that the applicant take the Law School Admission Test (LSAT). It is recommended that students take the LSAT in the June proceeding their junior year or in the October during their senior year, in order that there is enough time to complete applications prior to law schools' posted deadlines.

Four-Year Baccalaureate Program

No particular undergraduate major or undergraduate courses are necessary to gain admission into law school. Students are free to select any of the major programs offered at the University of Maryland, College Park. Students are encouraged to choose a major in which they have a strong interest and expect to perform well. Course selections should be guided by the need to develop skills that are essential in preparing to perform well in law school, on the LSAT, and ultimately as a lawyer. These skills include imaginative and coherent thinking, critical reasoning, accurate and perceptive reading, and a strong command of the spoken and written language, including grammar.

Three-Year Arts-Law Degree Program

The University of Maryland, College Park has cooperative agreements with the University of Maryland School of Law and the University of Baltimore School of Law 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 the College Park campus; (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 School of Law and/or the University of Baltimore School of Law. If applying for the Three-Year Arts/Law Degree program, the optimal time to take the LSAT is the June proceeding the student's sophomore 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 the University System of Maryland schools and will not be an option for all students. Admission into the Arts/Law program is not guaranteed by the University of Maryland, College Park, and is subject to the admissions criteria of the University of Maryland School of Law and the University of Baltimore School of Law.

For additional information, please contact the Pre-Law Advisor, 1117/0110 Hornbake Library, (301)405-2793.

Pre-Bio Medical Science Research and Medical Technology

Advisor: Chris Mays

Please read the General Information concerning pre-professional programs under the Pre-Professional Programs subcategory.

The pre-biomedical science research and medical technology program is designed to prepare students for entrance into the professional curriculum for medical technologists and biotechnologists. Pre-Medical Technology is not a degree-granting program at the University of Maryland, College Park.

A Baccalaureate degree program for a Bachelor's of Science in Medical Technology (BS-MT) generally follows a 2+2 model program. Students may complete two years of prerequisite courses at the University of Maryland, College Park and then apply for admission into a professional school to complete two years of professional coursework, which includes classroom, laboratory, and clinical education.

University of Maryland students also have the option of completing a four-year degree at College Park in their selected major, in addition to completing medical technology prerequisites. This is the 4+2 model program. In this case, students who complete degree requirements in their chosen major as well as the pre-medical technology prerequisites, would have a degree from the University of Maryland, College Park, in their chosen major in addition to the professional school prerequisites necessary for entrance into a professional medical technology program. Upon completion of a professional medical technology program, the student would be conferred a Bachelor's of Science in Medical Technology degree from said program.

Popular majors for students interested in medical technology include biology, cell and molecular biology, chemistry, and microbiology. However, any major is suitable as long as all prerequisite courses are completed. The Health Professions advisors will assist students in making an appropriate major selection.

Prerequisites of professional schools are subject to change; therefore, students are strongly encouraged to contact professional programs for the most current requirements. Contact the American Society of Clinical Pathologists or the National Accrediting Agency for Clinical Laboratory Sciences for specific information about individual BS-MT program prerequisites. Students may also visit the Health Professions resource library in 0110 Hornbake for professional school information. Admission to professional schools is competitive and is not guaranteed by the University of Maryland, College Park. Note: The University of Maryland at Baltimore offers a professional-level medical technology program.

American Society of
Clinical Pathologists
2100 West Harrison Street
Chicago, IL 60612
312-738-1336
www.ascp.org

National Accrediting Agency for Clinical
Laboratory Sciences
8410 W. Bryn Mawr Ave., Suite 670
Chicago, IL 60631

Some prerequisite courses usually required by most professional phase Medical Technology programs include, but are not limited to:

General Biology
Human Anatomy and Physiology
Inorganic and Organic Chemistry
Microbiology
Statistics
English Composition
Humanities Courses
Behavioral & Social Science Courses

Pre-Medicine

Advisor: Michael Ulrich

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. Courses intended for non-science majors 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. BSCI 124/125, BSCI 103 and BSCI 122 should **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

Advisor: Chris Mays

Please read the General Information concerning pre-professional programs under the Pre-Professional Programs subcategory.

The Pre-Nursing program is designed to prepare students for entrance into a professional curriculum for Nursing at institutions that offer Bachelor of Science in Nursing programs. Pre-Nursing is not a degree-granting program at the University of Maryland, College Park.

A Baccalaureate degree program for a Bachelor's of Science in Nursing (BSN) follows a 2+2 model program also known as a "Traditional Baccalaureate" program. Students may complete two years (about sixty credits) of prerequisite courses at the University of Maryland, College Park, and then apply for admission into a professional school to complete two years of professional coursework, which includes classroom, laboratory, and clinical education.

University of Maryland students also have the option of completing a four-year degree at College Park in their selected major, in addition to completing about twenty to twenty-five credits of nursing prerequisites. This is the "Second Degree" or "Accelerated Second Degree" model program. In this case, students who complete degree requirements in their chosen major as well as the pre-nursing prerequisites, would have a degree from the University of Maryland, College Park, in their chosen major in addition to the professional school prerequisites necessary for entrance into an accelerated BSN program. Accelerated Baccalaureate Nursing programs usually take thirteen to sixteen months to complete, whereas the Traditional Nursing programs usually take two years to complete. Upon completion of a professional nursing program, the student would be conferred a Bachelor's of Science in Nursing degree from said program.

Popular majors for students interested in nursing include biology, health, nutrition, physiology and neurobiology, and psychology. However, any major is suitable as long as all prerequisite courses are completed. The Health Professions advisors will assist students in making an appropriate major selection.

Prerequisites of professional schools are subject to change; therefore, students are strongly encouraged to contact professional programs for the most current requirements. Contact the National League for Nursing for specific information about individual nursing program prerequisites. Students may also visit the Health Professions resource library in 0110 Hornbake for professional school information. Admission to professional schools is competitive and is not guaranteed by the University of Maryland, College Park. Note: The University of Maryland at Baltimore offers a professional-level nursing program.

National League For Nursing
61 Broadway
New York, NY 10006
800-669-1656 or 1-212-363-5555
<http://www.nln.org>

Some prerequisite courses usually required by most professional phase, "Traditional" Nursing programs include, but are not limited to:

General Biology
Human Anatomy and Physiology
Inorganic and Organic Chemistry
Microbiology

154 Pre-Professional Programs

Principles of Nutrition
English Composition or Literature
Mathematics
Introduction to Psychology
Introduction to Sociology
Human Growth and Development

Pre-Occupational Therapy

Advisor: Chris Mays

Please read the General Information concerning pre-professional programs under the Pre-Professional Programs subcategory.

Pre-Occupational Therapy is not a degree-granting program at the University of Maryland, College Park. The Pre-Occupational Therapy program is designed to prepare students for entrance into a professional curriculum for Occupational Therapy at institutions that offer professional advanced degrees, such as master's or doctoral degrees.

Community colleges and technical schools offer associate's degrees or certificates to students who wish to become occupational therapy assistants. Certain colleges offer Bachelor degrees in Occupational Therapy, while some schools offer combined Bachelor's and Master's degree programs.

There are several educational pathways for students who wish to enter the occupational therapy field. University of Maryland students have the option of completing a four-year degree at College Park, in their selected major, in addition to completing occupational therapy prerequisites. After completion of their bachelor's degree and the occupational therapy prerequisites, students can choose to complete a Post-Bachelor's certificate, Master of Science program, or doctoral degree program in Occupational Therapy offered by professional schools. Students should thoroughly research the different educational pathways to determine the best route for their career.

Ethics or Philosophy
Humanities Courses
Behavioral & Social Science Courses

Pre-Physical Therapy

Advisor: Chris Mays

Please read the General Information concerning pre-professional programs under the Pre-Professional Program subcategory.

The Pre-Physical Therapy program is designed to prepare students for entrance into a professional curriculum for Physical Therapy at institutions that offer professional advanced degrees, such as master's or doctoral degrees. Pre-Physical Therapy is not a degree-granting program at the University of Maryland, College Park.

The track a student follows in order to obtain a Master's in Physical Therapy (MPT) degree varies depending on the professional schools to which the student intends on applying and, more importantly, the expected year of matriculation into the professional phase of Physical Therapy. Currently, the accepted, entry-level clinical degree to practice as a Physical Therapist is the MPT. Students currently can enter Master's level professional programs by two routes. The first route or educational pathway could be completing sixty to ninety credits of prerequisites and then applying to the MPT programs for which the student has completed the requirements. The length of time to complete the Master's level coursework is about two to three years. The second route could be completing a Baccalaureate degree at the University of Maryland, College Park, in addition to the prerequisites required by individual professional schools. Students who decide on this option then complete two to three years of Master's level coursework. In both the first and second routes, the end result would be receiving a MPT from the professional school the student attends.

Many physical therapy schools are now conferring a doctoral degree on students. For these schools, University of Maryland students need to complete a four-year degree in their selected major in addition to completing physical therapy prerequisites. Some physical therapy schools also require some health care experience in the physical therapy field.

There are several educational pathways for students who wish to enter the physical therapy field. Due to the many variables in the educational pathways options as well as in the required health care experience, students are encouraged to thoroughly research this profession and determine which educational pathway is the best route to reach their particular career goals.

Popular majors for students interested in physical therapy include biology, kinesiology, physiology and neurobiology, and psychology. However, any major is suitable as long as all prerequisite courses are completed. The Health Professions advisor will assist students in making an appropriate major selection.

Prerequisites for professional schools are subject to change; therefore, students are strongly encouraged to contact professional programs for the most current requirements. Contact the American Physical Therapy Association for specific information about individual program prerequisites. Students may also visit the Health Professions Resource library in O110 Hornbake Library for professional school information. Admission to professional schools is competitive and is not guaranteed by the University of Maryland, College Park. Note: The University of Maryland at Baltimore offers a professional-level physical therapy program.

The American Physical Therapy Association
1111 North Fairfax Street
Alexandria, VA 22314
703-684-2782
<http://www.apta.org>

Some prerequisite courses usually required by most professional phase Physical Therapy programs include, but are not limited to:

General Biology
Human Anatomy and Physiology
Chemistry
Physics
Exercise Physiology
Pre-Calculus or Calculus
Statistics
Psychology
Human Growth and Development
Ethics of Philosophy

English Composition
Public Speaking
Humanities Courses

Pre-Physician Assistant

Advisor: Chris Mays

Please read the General Information concerning pre-professional programs under the Pre-Professional Programs subcategory.

Pre-Physician Assistant is not a degree-granting program at the University of Maryland, College Park. The Pre-Physician Assistant program is designed to prepare students for entrance into a professional curriculum at institutions that offer professional advanced degrees or post-baccalaureate certificates. At the University of Maryland, students can complete the necessary prerequisite courses required by the professional physician assistant programs to which they will be applying.

There are several educational pathways for students who wish to enter the physician assistant field. Due to the many variables in the educational pathway options, students are encouraged to thoroughly research this profession and determine which educational pathway is the best route to reach their particular career goals.

Most physician assistant programs require applicants to have previous health care experience and some college education. The typical applicant already has a bachelor's degree and at least four years of health care experience. Commonly nurses, EMT's, and paramedics apply to PA programs. Check the particular prerequisites of the PA educational programs that interest you.

Popular majors for students interested in a career as a physician assistant include biology, physiology and neurobiology, and psychology. However, any major is suitable as long as all prerequisite courses are completed. The Health Professions advisors will assist students in making an appropriate major selection.

Prerequisites of professional schools are subject to change; therefore, students are strongly encouraged to contact professional programs for the most current requirements. Contact the American Academy of Physician Assistants for specific information about individual program prerequisites. Students may also visit the Health Professions resource library in O110 Hornbake for professional school information. Admission to professional schools is competitive and is not guaranteed by the University of Maryland, College Park.

American Academy of Physician Assistants
950 North Washington Street
Alexandria, VA 22314-1552
703-836-2272
<http://www.aapa.org>

Pre-Podiatric Medicine

Adviser: Michael Ulrich

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/O110 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:

156 Certificate Programs

University of Maryland, College Park, CORE Requirements
BIOL 105, 106, 222
CHEM 103, 113, 233, 243
BCHM 261 or 461; MICB 200
PHYS 121 (or 141), 122 (or 142)
MATH 220 (or 140) and 3 credits of other mathematics

Students should seek pre-veterinary advising through the Director, Center for Government and Corporate Veterinary Medicine, 1213 Avram Gudelsky Veterinary Center, University of Maryland, College Park, MD 20742-3711, (301) 935-6083, ext. 116 or 106.

Combined Undergraduate/Graduate Programs

- A. **Arts-Law, Arts-Dentistry, Arts-Medicine:** In these programs, students who have completed 90 undergraduate credits, who satisfy certain conditions, and who matriculate at the Medical, Dental, or Law School of the University of Maryland, Baltimore or the Law School of the University of Baltimore, may apply the successful completion of one year of their

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. Eyda Merediz, 2225 Jimenez Hall, by phone, (301) 405-6459, or by E-mail (emerediz@wam.umd.edu); or contact Christina Guidorizzi in the Latin-American Studies Office, 4205 Jimenez Hall, by phone (301) 405-6459 or by e-mail guidoc@wam.umd.edu.

Science, Technology and Society Certificate

1108 Chestertown Hall, 301-405-0527
www.sts.umd.edu/certificate

Certificate Requirements:

The Science, Technology, and Society (STS) Undergraduate Certificate program offers students an excellent opportunity to advance their understanding of the complex relationships between science, technology, and society by concentrating their CORE and elective courses (like a college "minor"). STS courses have been carefully chosen to fit closely into CORE and major field requirements of most students. Therefore, almost all College Park undergraduates can fulfill the certificate requirements without taking additional courses by careful selection of the courses that fulfill their CORE and elective requirements.

The STS Certificate program is comprised of 21 credits of coursework (including a capstone course), a monthly colloquium, and an internship opportunity. This mixture of learning experiences helps to cultivate an intellectual and personal forum in which students and faculty can work closely together. This program provides students with an interdisciplinary thematic link for their general education requirements, and it offers a chance for mentored research in areas of personal interest.

Certificate Requirements

21 credits are necessary to complete the STS Certificate: 9 credits of Fundamental Courses and 12 credits of Elective Courses.

Fundamental Courses (9 credits):

- A natural science or technology course satisfying CORE or a major and approved by the program director
- An introductory history of science and technology course (see program website)
- The senior STS capstone course (UNIV 401)

Elective Courses (12 credits):

- Students can choose from a list of over sixty approved courses representing a variety of topic areas relevant to the STS field from a host of disciplines (e.g., AMST, AREC, CPSP, ECON, GEMS, GVPT, HIST, HONR, MICB, NRSC, PHIL, SOCY, ZOOL). Over half of the electives also satisfy CORE Distributive Studies requirements. Two of the electives must be upper-level courses. (Please note: CORE Advanced Studies requires that two upper-level courses be taken outside the major after 56 credits. Upper-level STS courses satisfy this requirement. Check with your academic advisor in your major.) See program website for the complete list of electives.

Students must obtain advice and approval from the program director for their course choices. Students must maintain a minimum grade of "C" in each STS course. The STS program of study must include a minimum of 9 credits in upper division courses, 2 of which must be electives. It also may not exceed the following maximums: 9 credits of STS courses applied to the student's major; 3 credits of "Special Topics" or "Selected Topics" courses applied to the STS certificate; 9 credits of approved courses taken outside UMCP. Only 6 credits from courses with the AREC, ECON and GVPT prefixes may be used to satisfy the STS Certificate requirements.

Women's Studies Certificate**College of Arts and Humanities**

2101 Woods Hall, (301) 405-6827

<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) 405-6827.

Requirements for Certificate

To qualify for a certificate in Women's Studies, a student will be required to earn 21 credits in Women's Studies courses, nine of which must be at the 300/400 level. No more than three credit hours of special topics courses may be counted toward the certificate. No more than nine 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 468	.....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
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
WMST 453—Victorian Women in England, France, and the United States	.....3
WMST 454—Women in Africa*	.....3
WMST 455—Women in Medieval Culture and Society	.....3
WMST 457—Redefining Gender in the U.S., 1880-1935	.....3

158 Citations

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 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
WMST 425—Gender Roles and Social Institutions	3
SOCY 498W—Special Topics in Sociology: Women in the Military	3
WMST 324—Communication and Gender	3

*Counts toward Women's Studies Cultural Diversity Requirement

Philosophy
Portuguese Languages & Cultures
Spanish Languages & Cultures
Entrepreneurship
General Business
Geographic Information Science
Astronomy
Hydrology
Surficial Geology
Earth Material Properties
Earth History
Actuarial Mathematics
Applied Mathematical Modeling
Discrete Mathematics
Statistics
Meteorology
Weather and Climate
Atmospheric Chemistry
Citation in Secondary Education

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) 405-6827, or write to Women's Studies Department, 2101 Woods Hall, University of Maryland, College Park, MD, 20742-7415.

Course Code: WMST
Citations

CITATIONS

Comparative Religious Studies
Archaeology
Interdisciplinary Multi-Media & Technology
Russian Language
Korean Studies
Russian Language & Culture
Chinese Language
Chinese Studies
Ancient Greek Language & Literature
Classical Languages & Mythology
Latin Language & Literature
Comparative Studies
Literature by Women
British and American Literature
American Literature
British, Postcolonial, and International Anglophone Literature
Literature of the African Diaspora
Rhetoric (offered jointly with COMM)
Renaissance Studies
French Language & Culture (Modified)
Business & Management for Foreign Language Majors
Business Chinese, French, German, Japanese, Russian & Spanish
Expand Eligibility for Business Languages Citation
Italian Language & Culture
Germanic Studies
Jewish Studies
Linguistics
Music Studies
Music Performance
Value Theory
Cognitive Science
Philosophy of Science