

1989

# Catalog for 1989-1990, University of Maine, part 1

University of Maine

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CATALOG  
FOR 1989–1990

UNIVERSITY OF MAINE

The University of Maine shall not discriminate and shall comply with applicable laws prohibiting discrimination on the grounds of race, color, religion, sex, sexual orientation, national origin or citizenship status, age, handicap, or veteran status in employment, education, and all other areas of the University

The University of Maine does not discriminate on the basis of handicap in admission or access to, or treatment or employment in its programs and activities, in compliance with Section 504 of the Rehabilitation Act of 1973 and its implementing regulations.

In addition, the University of Maine does not discriminate on the basis of sex in its educational programs or activities, in compliance with Title IX of the Education Amendments of 1972 and its implementing regulations.

Questions and complaints about discrimination in any area of the University or about the application of Section 504 or Title IX should be directed to Suzanne Estler, Director of Equal Opportunity, 318 Alumni Hall, University of Maine, Orono, ME 04469, (207) 581-1226. Inquiries about both areas may also be referred to the Assistant Secretary for Civil Rights, U.S. Department of Education, Washington, D.C., or to the Director, Office for Civil Rights, U.S. Department of Education, Region I, John W. McCormack Post Office and Courthouse Building, Boston, MA 02109.

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**Information in this Catalog covers the academic year 1989–1990.**

The University of Maine reserves the right to revise, amend, or change items set forth in this BULLETIN from time to time. Accordingly, readers of this BULLETIN should inquire as to whether any such revisions, amendments, or changes have been made since the date of publication. The University of Maine reserves the right to cancel course offerings, to set the minimum and maximum sizes of classes, to change designated instructors in courses, and to make decisions affecting the academic standing of anyone participating in a course or program offered by the University of Maine.

# Approved Academic Calendar 1989–1990

## FALL SEMESTER 1989

Classes begin	Tuesday, September 5, 8:00 a.m.
Thanksgiving Break begins	Friday, November 17, 5:00 p.m.
Classes resume	Monday, November 27, 8:00 a.m.
Classes end	Friday, December 15, 5:00 p.m.
Commencement	Saturday, December 16, 10:30 a.m.
Final exams begin	Tuesday, December 19, 8:00 a.m.
Final exams end	Friday, December 22, 9:30 p.m.

## SPRING SEMESTER 1990

Classes begin	Monday, January 15, 8:00 p.m.
Spring Break begins	Friday, March 2, 5:00 p.m.
Classes resume	Monday, March 19, 8:00 a.m.
Classes end	Friday, May 4, 5:00 p.m.
Final exams begin	Monday, May 7, 8:00 a.m.
Final exams end	Friday, May 11, 12:30 p.m.
Commencement	Saturday, May 12, 10:30 a.m.

## Correspondence

Inquiries should be directed as indicated below:

**General administrative matters:** President, Dale W. Lick, Alumni Hall

**Admission to the freshman class and to advanced standing:** Director of Admissions, William J. Munsey, Chadbourne Hall

**College of Applied Sciences and Agriculture:** Dean of the College, Wallace C. Dunham, Winslow Hall

**College of Arts and Humanities:** Acting Dean of the College, Edward B. Laverty, Stevens Hall

**College of Business Administration:** Dean of the College, W. Stanley Devino, South Stevens Hall

**College of Education:** Dean of the College, Robert A. Cobb, Shibles Hall

**College of Engineering and Technology:** Dean of the College, Norman Smith, Barrows Hall

**College of Forest Resources:** Dean of the College, Fred B. Knight, Nutting Hall

**College of Sciences:** Dean of the College, Dagmar Cronn, Aubert Hall

**College of Social and Behavioral Sciences:** Dean of the College, Julia M. Watkins, Stevens Hall

**University College:** Dean of the College, Charles R. McRoy, Acadia Hall

**Graduate School and scholarships available for graduate students:** Dean of the Graduate School, Charles E. Tarr, Winslow Hall

**Continuing educational courses:** Acting Director, Continuing Education Division, Robert C. White, Merrill Hall

**Summer Session:** Acting Director, Robert C. White, Merrill Hall

**Conferences and Institutes:** Director, Bruce G. Stinson, 128 College Avenue

**Financial assistance:** Acting Director of Student Aid, David S. Baxter, Wingate Hall

**Financial services for students:** Assistant Vice President for Administrative Services, Alden E. Stuart, Alumni Hall

**International Research and Educational Programs:** John R. Benoit, Greenhouse

**Residence Halls:** Director of Residential Life, Scott Anchors, Estabrooke Hall

**Off-campus housing:** Associate Dean of Student Services, Maxine Harrow, Memorial Union

**Senior and alumni placement:** Placement Director, Adrian J. Sewall, Wingate Hall

**Student Records:** Registrar, John F. Collins, Jr., Wingate Hall

## Accreditation

The University of Maine is accredited by the New England Association of Schools and Colleges, Inc., which accredits schools and colleges in the six New England states. Accreditation by

the Association indicates that the institution has been carefully evaluated and found to meet standards agreed upon by qualified educators.

## The University of Maine System

The University of Maine System is a statewide system of public institutions of higher education. It is operated by a single Board of Trustees, which is appointed by the Governor. The chief academic and administrative officer for the system is the Chancellor, who is responsible to the Board of Trustees.

The University has campuses in Augusta, Farmington, Fort Kent, Machias, Orono, Pres-

que Isle, and Portland/Gorham (University of Southern Maine). The University of Maine includes the Colleges of Applied Sciences and Agriculture, Arts and Humanities, Business Administration, Education, Engineering and Technology, Forest Resources, Sciences, Social and Behavioral Sciences, the University College, and the Graduate School.

# General Information

The University of Maine is located about half-way between Kittery, the most southerly town in the state, and Fort Kent on the northern boundary. It is on U.S. Route 2A approximately eight miles from Bangor, the third largest city of the state. The University campus is a mile from the business section of Orono, an attractive town of about 10,000 people, and borders the Stillwater River, a branch of the Penobscot.

## History

The University was established originally as the State College of Agriculture and the Mechanic Arts under the provisions of the Morrill Act approved by President Abraham Lincoln in 1862. The next year, the State of Maine accepted the conditions of the act and in 1865 created a corporation to administer the affairs of the college. The original name was changed to the University of Maine in 1897.

The institution opened on September 21, 1868, with 12 students and two faculty members. Dr. Merritt Caldwell Fernald was appointed acting president. By 1871, curricula had been arranged in agriculture, civil engineering, mechanical engineering, and electives. From these curricula the Colleges of Agriculture, Technology, and Arts and Sciences gradually developed. Women have been admitted since 1872. The School of Education was established in 1930 and became the College of Education in 1958. The University operated a college of law from 1898 to 1920. After this unit was discontinued in 1920, the University did not offer law courses until 1961 when a School of Law, located in Portland, was added through a merger with Portland University.

Schools of Business Administration, Forestry, Home Economics (now Human Development), and Nursing were established in 1958. The School of Business Administration became the College of Business Administration in 1965. The University of Maine at Bangor became the University's sixth college in 1974 when it was renamed Bangor Community College; University College replaced Bangor Community College in 1985. Schools of Engineering Technology and Performing Arts were established in 1975. The College of Forest Resources was established in 1982.

The Maine Agricultural Experiment Station

was established as a division of the University by act of the Legislature of 1887, as a result of the passage by Congress of the Hatch Act. It succeeded the Maine Fertilizer Control and Agriculture Experiment Station, which had been established in 1885.

In 1980, the University of Maine was accorded Sea Grant College status by the Federal Government under provisions of the National Sea Grant College Program Act.

Graduate instruction has been given by various departments for many years. The first master's degree was conferred in 1881, and the first doctor's degree in 1960. Since 1923, graduate work has been a separate division in the charge of a dean.

Beginning in 1895, the Summer Session has usually been held each year. Classes are scheduled in three three-week sessions, two five-week sessions, a six-week session and an eight-week session. Summer Session is designed for teachers, school administrators, and for college students who desire to accelerate their work.

## Mission

The University of Maine is the land grant university and sea grant college of the State of Maine. The mission of the University of Maine is to provide for the State of Maine a center of academic excellence in which are housed the resources for knowledge creation and dissemination to a statewide audience. Undergraduate and graduate programs through the doctorate are provided in selected academic fields. Basic and applied research appropriate to Maine is an ongoing responsibility, while other creative endeavors, including basic research of national or international significance, are encouraged. Organized programs of public service are provided throughout the state.

## Non-discrimination Policies

The University of Maine is committed to a living, learning and working environment fully inclusive of the diverse populations it serves. Thus, the University shall not discriminate and shall comply with applicable laws prohibiting discrimination on the grounds of

race, color, religion, sex, sexual orientation, national origin or citizenship status, age, handicap, or veteran status in employment, education, and all other areas of the University.

Consistent with this policy, the University is responsible to: (1) provide a living, learning and working environment free of harassment related to any of the above characteristics and specifically related to sexual harassment, (2) provide reasonable accommodation to assure the fullest possible participation of persons with disabilities in the educational and employment life of the University, (3) assure employment and educational practices free of discrimination, and (4) provide full and impartial investigation of concerns regarding discrimination in these categories in any area of the University.

The University of Maine, as an equal opportunity educational institution, is committed to both academic freedom and the fair treatment of all individuals. It therefore discourages the use of sexist language. Language that reinforces sexism can arise from imprecise word choices that may be interpreted as biased, discriminatory, or demeaning even if they are not intended to be. Accordingly, all University proceedings, including classes, and communications, whether delivered orally or in writing, shall be free of sexist language.

Each member of the University community is urged to be sensitive to the impact of language and to make a personal commitment to eliminate sexist language. Guidelines on the use of nonsexist language can be provided by the Women in the Curriculum Program or Public Affairs.

Questions, concerns and complaints about discrimination in any area of the University or about the application of laws and regulations related to equal opportunity and affirmative action should be directed to the Director of Equal Opportunity, 324 Shibles Hall, 581-1226.

## Undergraduate Degree Programs

### Arts and Sciences (B.A. Degree)

Anthropology	Chemistry
Art(Studio, Art History)	Computer Science
Biology	Economics
Broadcasting	English
	Foreign Languages

& Classics	Education)
(French, German, Latin, Modern Languages, Romance Languages, Spanish)	Philosophy
Geological Sciences	Physics
History	Political Science
International Affairs	Psychology
Journalism	Public Management
Mathematics	Social Work
Medical Technology	Sociology
Music (B.A., B.M. in Performance & B.M. in Music)	Speech Communication
	Theatre
	Zoology (including pre-medical & pre-dental)

### Interdisciplinary Course Concentrations (ICC'S)

The purpose of the Interdisciplinary Course Concentration is to provide students with the opportunity to integrate substantive material and understandings across several formal disciplines, thus to broaden their perceptions in a systematic and controlled fashion. Like the major, the concentration is directed toward a special learning goal rather than to a special category of student. All students who are in good standing are invited to declare an interdisciplinary course concentration (i.e., fully matriculated students neither on probation or any other form of limited academic acceptance). To receive interdisciplinary credit a student must earn at least a 2.0 ("C") in each course in a given concentration. Successful completion of an ICC is noted on the student's transcript.

Students intending to declare an Interdisciplinary Course Concentration should do so during the second semester of their sophomore year. In some cases it may be desirable to declare a concentration earlier, and permission may be granted to declare a concentration later in a student's undergraduate career. A form for declaring an ICC may be obtained from the Office of Student Academic Services and Special Programs, Stevens Hall.

### Canadian Studies

#### Interdisciplinary Concentration

##### Faculty:

Assoc. Prof. Victor A. Konrad, Anthropology,  
Coordinator, Canada House



Prof. Robert Babcock, History, 200 Stevens Hall  
 Assoc. Prof. John Battick, History, 130 Stevens Hall  
 Assoc. Prof. Cathleen Bauschatz, Foreign Languages, 252 Little Hall  
 Assoc. Prof. Robson Bonnicksen, Anthropology, 459 College Avenue  
 Prof. Harold Borns, Geology, 304A Boardman Hall  
 Asst. Prof. Kent Carter, Business Administration, S. Stevens  
 Asst. Prof. Howard Cody, Political Science, 31 N. Stevens  
 Prof. Edward Collins, Political Science, 27 N. Stevens Hall  
 Assoc. Prof. David Decker, Art, 111 Carnegie Hall  
 Prof. Stewart Doty, History, 145 Stevens Hall  
 Prof. Richard Emerick, Anthropology, 52A S. Stevens Hall  
 Assoc. Prof. Alaric Faulkner, Anthropology, 44 S. Stevens Hall  
 Asst. Prof. Jacques Ferland, History, 275C Stevens Hall  
 Asst. Prof. Robert B. Forster, Forest Resources, Nutting Hall  
 Assoc. Prof. James Gallagher, Sociology, 201 Fernald Hall  
 Lecturer James Herlan, Foreign Languages, Little Hall  
 Asst. Prof. Stephen Hornsby, Anthropology, Canada House  
 Prof. Edward Ives, Anthropology, 42 S. Stevens Hall  
 Assoc. Prof. Alan Kezis, Agricultural and Resource Economics, 206 Winslow Hall  
 Prof. Alan Miller, Journalism, 101B Lord Hall  
 Assoc. Prof. Peter Morici, Economics, 235 Stevens Hall  
 Asst. Prof. Kenneth Norris, English, 304 Neville Hall  
 Asst. Prof. Michael Palmer, Political Science, 31 N. Stevens Hall  
 Asst. Prof. Raymond Pelletier, Foreign Languages, 266 Little Hall  
 Prof. Robert Rioux, Foreign Languages, 214 Little Hall  
 Prof. David Sanger, Anthropology, 26 S. Stevens Hall  
 Assoc. Prof. Kathryn Slott, Foreign Languages, 278 Little Hall  
 Prof. David Smith, History, 150 Stevens Hall  
 Prof. Emerita Alice Stewart, History, Canada House  
 Prof. James Wilson, Economics, 225 Stevens  
 Prof. Bernard Yvon, Education, 317 Shibles Hall

### Rationale

The Canadian Studies Program at UM offers a greater number and wider range of courses in this area than any other University in the United States. For students enrolled in any college at Orono, several options in Canadian Studies are available. Eligible students may enroll in the 18-hour concentration, or one of a series of course "clusters." Canadian Studies provides a valuable area of study for (1) students entering fields of education, business, and government where knowledge of Canada is increasingly important; (2) those specializing in international relations; and (3) undergraduates wishing to pursue graduate work either in a Canadian field or in an area with a Canadian component.

Central to the program is CAN 101, Introduction to Canadian Studies. This course provides a general interdisciplinary introduction and prepares students for further study of Canada. It is a prerequisite for the concentrations and the course clusters. Minors or concentrations involve 18 credit hours and course clusters require 12 credit hours. In all cases, at least half the courses, including CAN 101, must be core courses. The remainder may be selected from the related offerings. The clusters may include courses taken at a Canadian University through the Canada Year program sponsored by the Canadian-American Center.

### ICC 1—New England and the Atlantic Provinces

CAN 101 Introduction to Canadian Studies\*  
 CAN 300 Seminar in Canadian Studies  
 CAN 401 Readings in Canadian Studies  
 ANT 422 Folklore of Maine and the Maritime Provinces  
 ANT 570 Seminar in Northeastern North American Prehistory  
 ECO 439 International Trade and Commercial Policy  
 ECO 440 Canadian Economics: Issues and Policies  
 ECO 445 Regional Economics  
 GEO 210 Geography of Maine  
 GEO 214 Geography of Canada and the United States  
 GEO 302 Geographical Perspectives on Atlantic Canada  
 GES 543 Quaternary History of Northeastern North America  
 HON 302 Honors Group Tutorial II: Canadian Studies Topics

HTY 111 Canada: From Cartier to Trudeau  
 HTY 210 History of Maine  
 HTY 458 History of French Canada and  
 Franco-Americans  
 HTY 459 Colonial Canada  
 HTY 460 Modern Canada  
 INT 396 Field Experience (Internship in  
 Canadian Studies)  
 OCE 270 Oceanography Today  
 POS 252 United States-Canadian Relations  
 POS 387 International Law  
 POS 587 Problems in International Law

### ICC 2—Canadian Culture

CAN 101 Introduction to Canadian Studies\*  
 CAN 300 Seminar in Canadian Studies  
 CAN 401 Readings in Canadian Studies  
 ARH 168 Canadian Art  
 ANT 422 Folklore of Maine and the Maritime  
 Provinces  
 ANT 451 North American Indian Ethnology  
 ANT 457 North American French Cultures  
 and Societies  
 ANT 460 Peoples and Cultures of the Circum-  
 polar Area  
 ANT 472 North American Prehistory  
 ANT 473 Historic Archeology  
 ENG 236 Canadian Literature  
 ENG 436 Topics in Canadian Literature  
 FRE 254 Popular Culture in French Canada  
 FRE 256 French Canadian Civilization  
 FRE 452 The Novel of Quebec  
 FRE 490 Topics in French  
 FRE 552 Films, Video Drama and Literature  
 in French Canada  
 GEO 214 Geography of Canada and the  
 United States  
 GEO 301 Historical Geography of North  
 America  
 GEO 350 The Geography of Canada  
 HON 302 Honors Group Tutorial II:  
 Canadian Studies Topics  
 HTY 459 Colonial Canada  
 HTY 460 Modern Canada  
 INT 396 Field Experience (Internship in Ca-  
 nadian Studies)

### ICC 3—Modern Canada

CAN 101 Introduction to Canadian Studies\*  
 CAN 300 Seminar in Canadian Studies  
 CAN 401 Readings in Canadian Studies  
 ANT 460 Peoples and Cultures of the Circum-  
 polar Area  
 ECO 439 International Trade and Commer-  
 cial Policy  
 ECO 440 Canadian Economics: Issues and  
 Policies

ECO 445 Regional Economics  
 ENG 236 Canadian Literature  
 ENG 436 Topics in Canadian Literature  
 GEO 214 Geography of Canada and the  
 United States  
 GEO 350 Geography of Canada  
 HON 302 Honors Group Tutorial II:  
 Canadian Studies Topics  
 HTY 111 Canada: From Cartier to Trudeau  
 HTY 460 Modern Canada  
 HTY 482 Canada and the American Economy  
 HTY 521 Canada and the United States, 1783-  
 Present  
 HTY 522 Canadian Economic History  
 INT 396 Field Experience (Internship in Ca-  
 nadian Studies)  
 INT 537 Evolution and Development of  
 Canadian Government and Politics  
 JBR 214 The Foreign Media  
 POS 241 Politics in Contemporary Societies  
 POS 243 Canadian Government and Politics  
 POS 252 United States-Canadian Relations  
 POS 387 International Law  
 POS 587 Problems in International Law  
 SOC 431 Canadian Society  
 SOC 442 Population and Society

### ICC 4—French Canada

CAN 101 Introduction to Canadian Studies\*  
 CAN 300 Seminar in Canadian Studies  
 CAN 401 Readings in Canadian Studies  
 ANT 457 North American French Cultures  
 and Societies  
 ANT 473 Historic Archeology  
 FRE 297 French May-Term  
 FRE 254 Popular Culture in French Canada  
 FRE 256 French Canadian Civilization  
 FRE 440 Franco-American Civilization  
 FRE 442 French Language of North America  
 FRE 452 The Novel of Quebec  
 FRE 456 Seminar in Quebec Studies  
 FRE 490 Topics in French  
 FRE 550 Seminar in French Canadian Litera-  
 ture and Language  
 FRE 552 Films, Video Drama and Literature  
 in French Canada

\*Required course for the Canadian Studies cluster. A minimum of three other courses ( nine credit hours) is required for the completion of the cluster. Courses at the 500 level are for graduate students and selected undergraduates. CAN 300 Seminar in Canadian Studies, may be substituted for a senior-level course in any of the clusters. To register for the Canadian Studies clusters, students must consult with their major advisor, their academic dean, and the Canadian-American Center at Canada House, 154 College Avenue.

FRE 597 Projects in French Canadian Literature  
 FRE 598 Projects in French Canadian Literature  
 GEO 214 Geography of Canada and the United States  
 HON 302 Honors Group Tutorial II:  
 Canadian Studies Topics  
 HTY 111 Canada: From Cartier to Trudeau  
 HTY 458 History of French Canada and Franco-Americans  
 HTY 459 Colonial Canada  
 HTY 460 Modern Canada  
 INT 396 Field Experience (Internship in Canadian Studies)

## Classical Studies

### Interdisciplinary Concentration

#### Faculty

Asst. Prof. Kristina M. Passman, Co-ordinator,  
 Foreign Language and Classics, 254 Little,  
 (2080)  
 Asst. Prof. Karen-edis Barzman, Art, 151 Carnegie (3252)  
 Assoc. Prof. Jay Bregmen, History, 200A Stevens (7808)  
 Assoc. Prof. Michael Howard, Philosophy, The Maples (3864)  
 Asst. Prof. Michael Palmer, Political Science, 31 N. Stevens (1879)  
 Prof. J. Norman Wilkinson, Theatre, 209 E. Annex (2405)  
 Assoc. Prof. John R. Wilson, English, 205 Neville Hall

#### Rationale

The classical period in Western history, defined as the period from the Bronze Age to the fall of the Roman empire in the 5th century C.E., comprises the "roots" of modern society. In order to understand where we are and where we are going, it is necessary to know where we have been. European and American literature, philosophy, law, religion, politics, language, and art have all been either directly or indirectly formed in reaction to Classical culture. By examination and study of Classical civilization, the student will develop a sense of how the ancients responded to the universal questions of human experience. Through an implicit comparison of the cultures of ancient Greece and Rome to our own, the student will also come to have a fuller understanding of the humanist and cultural impulses which have formed and

which continue to form our own experience. This course concentration is particularly useful to the student with interests in ancient history, in philosophy, art history, anthropology, literature, and political science. It will also prove useful to the student preparing for a career in law.

#### Requirements:

A minimum of 18 credits or 6 courses. The student who elects this concentration normally chooses Latin as a fulfillment of the language requirement. The advanced student may choose ancient Greek rather than Latin (as available), with permission of the instructor. The student will take *either* two semesters of Latin beyond the elementary level or two semesters of Greek at elementary level or above. In addition, the student will take HTY 101, Classical Civilization, and the remaining three courses in one or two areas listed below. The list below is flexible; new courses, special seminars, pertinent readings in upper level Honors courses, and independent study may be approved for Classical Studies.

#### Course Offerings

##### Art History:

ARH 251 Classical Art  
 ARH 361 Topics in Art History: Greek Art

##### Classics:

CLA 101 Greek Literature in English Translation  
 CLA 102 Latin Literature in English Translation  
 ENG 300 The Bible as Literature

##### Foreign Languages: English

FOL 231 Western Tradition in Literature:  
 Homer through Renaissance

##### Greek

GRE 101 Elementary Greek I  
 GRE 102 Elementary Greek II  
 GRE 203 Readings in Greek Literature I  
 GRE 204 Readings in Greek Literature II

##### History:

HTY 101 Classical Civilization  
 HTY 301 History of Greece  
 HTY 402 Roman History  
 HTY 433 Greek and Roman Mythology  
 HTY 434 Greek and Roman Heritage in America

##### Latin:

LAT 203 Readings in Latin Literature I  
 LAT 204 Readings in Latin Literature II  
 Upper level Latin as offered

**Philosophy:**

PHI 410 History of Ancient Philosophy

PHI 482 The New Testament and Early Christianity

**Political Science:**

POS 212 Introduction to Political Theory

POS 389 Classical Political Thought

**Theatre**

THE 112 Masterpieces of World Drama

**Developmental Disabilities****Interdisciplinary Concentration***Faculty*

Assoc. Prof. Barbara Csavinszky, Human Development, Coordinator, 32 Merrill Hall

Assoc. Prof. Cleo Berkun, Social Work, 201C Fernald Hall

Assoc. Prof. Dana Birnbaum, Child Development, 33 Merrill Hall

Assoc. Prof. Phyllis Brazee, Education, 205 Shibles Hall

Asst. Prof. Stephen Butterfield, Physical Education, 103 Lengyel

Assoc. Prof. Richard Cook, Nutrition, 25 Merrill Hall

Prof. William Dopheide, Comm. Disorders, 208 E. Annex

Asst. Prof. Patricia Edwards, Special Education, 106 Shibles Hall

Asst. Prof. Jane Fisher, Psychology, 368 Little Hall

Prof. Stanley Freeman, Education, 112 Shibles Hall

Assoc. Dean Elaine Gershman, UAP Coordinator, Psychology, 100 Stevens Hall

Assoc. Prof. Katheryn Grzelkowski, Sociology, 201B Fernald Hall

Prof. Walter Harris, Education, 151 Shibles Hall

Assoc. Prof. Donald Hayes, Psychology, 301 Little Hall

Asst. Prof. Laurie E. Hicks, Art, 157 Carnegie Hall

Asst. Prof. Marilyn Kertoy, Speech Communication, 330 Stevens Hall

Prof. Michael Lewis, Art, 104 Carnegie Hall

Prof. Shirley Oliver, Child Development, 12 Merrill Hall

Asst. Prof. Steven Ott, Public Administration, 9 N. Stevens Hall

Inst. Jill Perrone, Nursing, 160 College Ave.

Prof. John Pettit, Communication Disorders, Conley Speech and Hearing Center

Prof. Marisue Pickering, Communication Disorders, 209 Alumni Hall

Asst. Prof. David Samuelian, Human Services, 107 Caribou Hall, UC

Asst. Prof. Gary Schilmoeller, Child Development, 37 Merrill Hall

Asst. Prof. Pamela Schutz, Education, 301 Shibles

Assoc. Prof. Frank Setter, Human Services, 101 Caribou Hall, UC

Prof. Julia Watkins, Social Work, 105 Stevens Hall

Asst. Prof. Lucille Zeph, Special Education, 305 Shibles Hall

**The University Affiliated Program**

The University Affiliated Program (UAP) provides students with an opportunity to learn about developmental disabilities within an interdisciplinary academic concentration. Students declare this concentration in addition to their major field of study. The components of the program are: A common core of courses which includes one course in normal child behavior, a course in exceptionality and two or more courses elected from a list of approved courses offered by participating colleges, plus a series of seminars on disabilities and a practicum experience with Behavioral and Developmental Pediatrics at Eastern Maine Medical Center or with one of the UAP cooperating agencies. Through these experiences, students develop an appreciation of the many factors affecting development. They develop special skills and learn how their own specialty can operate with other disciplines to provide the most beneficial program for an individual with developmental disabilities.

The developmental disabilities course concentration is open to selected undergraduate students in the following departments and areas:

- Art Education / Art
- Child Development / Family Relations
- Elementary Education
- Food and Nutrition
- Health, Physical Education and Recreation
- Human Services
- Nursing
- Psychology
- Social Work
- Sociology

To apply for admission, consult with one of the above faculty from your department.

**Course Offerings**

- A. PREREQUISITES: Choose at least one normal child behavior course (Three credits).
- CHF 201 Introduction to Child Development 3
- PSY 323 Psychology of Childhood 3
- B. CORE: Choose at least one course—Three credits.
- SED 400 Survey of Exceptionality 3
- PSY 428 Psychology of the Exceptional Child 3
- C. ELECTIVES: Choose at least two electives for six credits. These must be outside the student's major.
- AED 171 The Teaching of Art 3
- CHF 331 Cognitive Development 3
- CHF 352 Strategies for Family Intervention 3
- CHF 433 Adolescence 3
- CHF 434 Adult Development and Aging 3
- CHF 435 Developmental Assessment 3
- HNF 101 Introduction to Food and Nutrition 3
- HNF 301 Life Cycle Nutrition 3
- HPR 256 Elementary School Physical Education 3
- HPR 270 Motor Development and Learning 3
- HPR 367 Mainstreaming in Physical Education/Recreation 3
- MUS 298 Special Subjects in Music: Introduction to Music Therapy 3
- PSY 308 Theories of Personality 3
- PSY 312 Abnormal Psychology 3
- PSY 324 Psychology of Adolescence 3
- SED 401 Introduction to Education of Severely Handicapped 3
- SOC 313 Deviant Behavior 3
- SOC 318 Sociology of the Family 3
- SOC 329 Sociology of Sex Roles 3
- SOC 337 Sociology of Mental Illness 3
- SOC 439 Sociology of Health Medicine 3
- SPC 130 Introduction to Communication Disorders 3
- SPC 454 Communication

- Development in Children 3
- SPC 380 Language and Speech Development 3
- SPC 388 Hearing Impairment 3
- SWK 320 Introduction to Social Work and Social Welfare 3
- SWK 440 Social Welfare Policy and Issues 3
- SWK 350 Human Behavior and the Social Environment 3
- D. PRACTICUM: Choose three to six credit hours of work.
- The experience in the University Affiliated Program (UAP) may be taken under a field experience or special problems designation depending upon the specific discipline and will include at least one lecture/ discussion seminar in developmental disabilities.
- E. TRANSCRIPTS: Satisfactory completion of the concentration will result in the concentration specifically being indicated on a student's transcript.

## Environmental Issues and Ecological Studies

### Interdisciplinary Concentration

#### Faculty

- Prof. Melvin Gershman, Microbiology and Animal and Veterinary Sciences, Coordinator, 302 Hitchner Hall
- Assoc. Prof. Christopher Cronan, Botany, 202 Deering Hall
- Prof. Ronald Davis, Botany, 217 Deering Hall
- Prof. John Dearborn, Zoology, 321 Murray Hall
- Prof. Malvern Gilmartin, Zoology, 306 Murray Hall
- Assoc. Prof. William Glanz, Zoology, 311 Murray Hall
- Prof. Rollin Glenn, Plants and Soils, 115 Deering Hall
- Prof. Bradford Hall, Geological Sciences, 110 Boardman Hall
- Assoc. Prof. Malcolm Hunter, Wildlife, 226 Nutting Hall
- Assoc. Prof. George Jacobson, Jr., Botany, 18 Deering Hall
- Prof. Peter Kleban, Physics, 222 Bennett Hall
- Prof. Fred Knight, Forestry, 208 Nutting Hall
- Prof. Irving Kornfield, Zoology, 215 Murray Hall
- Assoc. Prof. Bernard McAlice, Botany and Oceanography, 9 Deering Hall
- Assoc. Prof. Stephen Reiling, Agricultural Economics, 207 Winslow Hall

Assoc. Prof. Chet Rock, Civil Engineering, 457 Aubert Hall  
 Asst. Prof. Paul Roscoe, Anthropology, 40 S. Stevens Hall  
 Assoc. Prof. Edward Schriver, History, 115 Stevens Hall  
 Prof. Malcolm Shick, Zoology, 211 Murray Hall  
 Assoc. Prof. William TeBrake, History, 275B Stevens Hall  
 Asst. Prof. Warren Tomkiewicz, Education, 212 Shibles Hall  
 Prof. Robert Vadas, Botany and Oceanography, 209 Deering Hall

### Rationale

To cope with an increasing number of actual and potential environmental problems requires a well-informed citizenry. Environmental concerns are considered in a number of courses offered by the University. Some relate to social issues and some accentuate Ecology and Biology and involve various natural sciences.

As an introduction to the Environment and Ecology Concentration, all students are required to take ANV 250 (Our Environment) and ARE 371 (Introduction to Natural Resource Economics and Policy) or INT 219 (Introduction to Ecology). Science majors may substitute INT 319 (General Ecology) for INT 219. In addition, students will choose four courses from the list below for a minimum of 18 credit hours. It is recommended that the selection of offerings be made in consultation with the coordinator of the concentration and the student's major advisor.

### Course Offerings

Anthropology:  
 ANT 464 Cultural Ecology Biology:  
 BIO 468 Limnology Civil Engineering:  
 CIE 331 Fundamentals of Environmental Engineering Education:  
 ESC 444 Basic Field Ecology Forestry:  
 FTY 349 Principles of Forest Management Geological Sciences:  
 GES 101-102 Aspects of the Natural Environment History:  
 HTY 217 Environmental History of Europe  
 HTY 277 History of the Treatment of the American Environment Interdepartmental Listings:  
 INT 290 Nuclear War Microbiology:  
 MCB 400 Our Microbial World Oceanography:  
 OCE 501 Biological Oceanography Plants

and Soils:

PSS 144 Soil and Water Conservation Wildlife  
 WLM 320 Introduction to Wildlife Conservation Zoology:  
 ZOL 213 Introduction to Marine Science  
 ZOL 301 Natural History of the Maine Coast  
 ZOL 524 Population Biology  
 ZOL 525 Community Ecology  
 ZOL 585 Physiological Ecology  
 ZOL 586 Physiological Ecology Laboratory

## Franco-American Studies

### Interdisciplinary Concentration

#### Faculty

Asst. Prof. Raymond Pelletier, Foreign Languages, Coordinator, 266 Little Hall  
 Prof. Jacob Bennett, English, 313 Neville Hall  
 Prof. Stewart Doty, History, 170 Stevens Hall  
 Assoc. Prof. James Gallagher, Sociology, 201 Fernald Hall  
 Lecturer James Herlan, Foreign Languages, Little Hall  
 Assoc. Prof. Victor Konrad, Anthropology, Canada House  
 Dir. Yvon Labbe, Franco-American Affairs, 126 College Avenue  
 Professor Robert Rioux, Foreign Languages, 214 Little Hall  
 Professor Bernard Yvon, Education, 317 Shibles

### Rationale

The past decade witnessed the emergence on campuses throughout the nation of academic programs that document the contribution of America's ethnic communities to the creation of a multicultural society. In New England, and particularly in Maine where citizens of French-Canadian and Acadian descent number approximately 35 percent of the population, Franco-Americans provide a unique example of a cultural group that has been dedicated to keeping its language and culture alive for the past one hundred years. As such, Franco-Americans provide an essential key to understanding the region's cultural identity and diversity and a strong link to developing political and economic ties with French-speaking Canadians.

A program of Franco-American studies relates to North American history, to sociological, anthropological, linguistic, literary, and educational issues and is designed to integrate theories and methodologies from each of these disciplines. The initial focus of this course con-

centration is on the people of French-Canadian and Acadian ancestry in New England. As the student progresses through the concentration, options become available to relate cultural, linguistic, historical, and social characteristics, and educational policies to the mother country or to place them in the context of American society. All aspects of the rich past of Franco-American culture, ranging from the study of language and lifeways to the examination and analysis of contemporary issues, are aimed at creating a greater understanding and appreciation of the state and the region.

The participating faculty members in this course cluster are committed to the idea that a society can best be approached on its own terms and through an interdisciplinary curriculum. They are also committed to achieving a better understanding of America's multicultural society.

### Course Offerings

In order to qualify for a course concentration in Franco-American studies, a student must develop competency in the following areas:

#### A. Franco-American Culture and History

All students must earn six credits chosen from among the following courses:

ANT 457 North American French Cultures and Societies

FRE 440 Franco-American Civilization

FRE 442 French Language of North America

HTY 458 History of French Canada and Franco-Americans

#### B. French Language

Students are required to complete the FRE 203/204 sequence or the FRE 205/206 sequence for Franco-Americans fluent in French or to demonstrate comparable proficiency by examination. All students are strongly encouraged to go beyond this minimum level of proficiency by participating in the variety of courses and programs offered by the Department of Foreign Languages.

#### C. Franco-American Culture as it Relates to a Broader Range of Academic Disciplines

Students are required to take 12 semester hours outside their major from any of three of the following clusters, with no fewer than two courses chosen from each cluster. (For example, a history major will probably take at least two courses in the history cluster, but in order to satisfy the requirements for this concentration, he or she must also select two

courses from the French cluster and two courses from the Society and Culture clusters.)

### Education

EBI 380 Methods and Materials for Bilingual Instruction

EBI 390 Introduction to Bilingual Education

EBI 560 Advanced Studies in Bilingual Education

### Folklore

ANT 422 Folklore of Maine and the Maritime Provinces

ANT 423 Folksong

ANT 424 Narrative

ANT 425 Oral History and Folklore: Fieldwork

### French

FRE 256 French Canadian Civilization

FRE 452 The Novel of Quebec

FRE 456 Seminar in Quebec Studies

### Geography

GEO 210 Geography of Maine

GEO 215 Cultural Geography

GEO 301 Historical Geography of North America

### History

HTY 459 Colonial Canada

HTY 460 Modern Canada

HTY 475 American Social History I

HTY 476 American Social History II

### Language

INT 410 Introduction to the Study of Linguistics

INT 380 Sociolinguistics

ANT 481 Language and Culture

### Society and Culture

SOC 338 Race and Culture Conflict

ANT 439 Psychological Anthropology

ANT 468 Social Anthropology of Complex Societies

## Geography

### Interdisciplinary Concentration

#### Faculty

Asst. Prof. Stephen Hornsby, Anthropology,  
Coordinator, Canada House

Professor Marshall Ashley, Forestry, 208 Nutting Hall

Professor Richard Blanke, History, 115C Stevens Hall

Assoc. Prof. Robson Bonnicksen, Anthropology, 495 College Ave.

Professor Melvin Gershman, Animal and Veterinary Sciences and Microbiology, 302 Hitchner Hall

Professor Abul Huq, Economics, 240 Stevens Hall

Assoc. Prof. Victor Konrad, Anthropology, Canada House

Prof. Irving Kornfield, Zoology, 215 Murray Hall

Assoc. Prof. Stephen Reiling, Agricultural and Resource Economics, 207 Winslow Hall

Professor Walter Schoenberger, Political Science, 33 N. Stevens Hall

Assoc. Prof. Edward Schriver, History, 115A Stevens Hall

Prof. Thomas Taylor, Public Administration, 39 N. Stevens Hall

Assoc. Prof. William TeBrake, History, 275B Stevens Hall

Assoc. Prof. David Tyler, Civil Engineering, 120 Boardman Hall

Professor Claude Westfall, Engineering Technology, 202 E. Annex

(The above list represents faculty currently teaching courses included in the Geography Course Cluster. Changes occur from semester to semester and year to year.)

### Rationale

Geography is an established discipline at most American universities. The last 30 years have seen considerable growth of geography departments as the discipline moved from a focus on regional studies to the development of spatial and locational theory. The discipline, however, remains broadly based in earth sciences and humanities as well as in the social sciences. Geographers pursue research and teaching in areas as diverse as geomorphology, hydrology, transportation, urban planning, cultural ecology, man-environment relationships, and pre-history. Geography courses and degrees appeal to undergraduates seeking a general yet practical University education. Geography graduates find employment in such career fields as resource management, urban and regional planning, and environmental assessment, as well as in the traditional occupations of elementary and secondary school teaching.

Although the University of Maine does not offer either the B.A. or B.S. degree in geogra-

phy, a considerable number of geography and geography-related courses are taught on a regular basis. The Geography Course Cluster provides students interested in the field the opportunity to combine, with their major, a general or focused set of courses (minimum, 18 credit hours) in human geography. Students interested only in aspects of physical geography are urged to consider courses in geology and the Environmental Issues and Ecological Studies cluster.

GEO 201, Introduction to Human Geography, or GEO 210, Geography of Maine, should be taken by the interested student in the freshman or sophomore year. The student is also urged to discuss and plan course selection with the Coordinator, Assistant Professor Stephen Hornsby (Anthropology-Geography).

### Course Offerings

A. Core Curriculum. Three to six credit hours

1. Prerequisite

GEO 201 Introduction to Human Geography

GEO 210 Geography of Maine

GEO 215 Cultural Geography

2. Students are urged to select one of the following courses:

GEE 116 Cartographics

SVE 111 Plane Surveying

FOE 206 Photogrammetry and Remote Sensing

ANT 497 Departmental Projects (Field Experience in Geography - May term)

B. Elective Courses. Twelve to 15 credit hours, with no more than three credit hours below the graduate level.

Although it is possible to take a wide range of elective courses, most students will find it useful to select courses which lead to typical teaching and career orientations in geography. The elective courses are grouped to reflect such orientations.

1. Urban and Regional Planning

Careers in public administration, marketing, resource management and numerous other areas demand an understanding of human spatial and locational relationships, and an ability to predict how humans organize space. This knowledge is of particular importance in planning the growth of cities and their surrounding regions. The student interested in urban and regional planning should select from the following list of courses:



GEO 210 Geography of Maine  
 GEO 214 Geography of Canada and the United States  
 GEO 350 The Geography of Canada  
 ECO 444 Urban Economics  
 ECO 445 Regional Economics  
 POS 233 Urban Politics  
 ARE 474 Land Use Planning  
 PAA 580 City and Regional Planning

## 2. Cultural-Historical

Like historians, some geographers are concerned with the past, and, like anthropologists, others are involved in the study of different cultures. In both respects, a geographical perspective adds considerable breadth of knowledge on topics such as the spread of settlements, the diffusion of cultural traits, and the nature of past landscapes. Students, particularly those selecting majors in anthropology and history, can enrich and broaden their programs of study with courses in historical and cultural geography.

ANT 464 Cultural Ecology  
 ANT 475 Paleoenvironmental Archeology  
 HTY 277 History of the Treatment of the American Environment  
 GEO 210 Geography of Maine  
 GEO 214 Geography of Canada and the United States  
 GEO 215 Cultural Geography  
 GEO 301 Historical Geography of North America  
 GEO 302 Geographical Perspectives on Atlantic Canada  
 GEO 350 The Geography of Canada

Students may also include up to six credit hours of regional anthropology (ANT 422, ANT 441, ANT 442, ANT 451, ANT 453, ANT 454, ANT 460, ANT 471, ANT 472) and regional history (HTY 301, HTY 402, HTY 409, HTY 422, HTY 423, HTY 424, HTY 425, HTY 426, HTY 435, HTY 436, HTY 337, HTY 441, HTY 447, HTY 448, HTY 455, HTY 456)

## 3. Human Use of Earth

The human relationship with the environment is a matter of increasing concern to society. This theme has always been a major consideration of geography. The student interested in the human use of the earth, whether as a step to a career

in environmental resource management or to gain a broader understanding of the human place in the environment, is urged to select courses from the following:

GEO 214 Geography of Canada and the United States  
 GEO 215 Cultural Geography  
 INT 219 Introduction to Ecology  
 ANV 250 Our Environment  
 PSS 144 Soil and Water Conservation  
 BIO 260 Interaction Between Humans and Their Environment  
 ANT 475 Paleoenvironmental Archaeology  
 HTY 217 Environmental History of Europe  
 HTY 277 History of the Treatment of the American Environment  
 INT 319 General Ecology  
 ARE 371 Introduction to Natural Resource Economics and Policy  
 ARE 474 Land Use Planning  
 PSS 428 Landscape Design Problems  
 FTY 457 Forest Watershed Management

INT 500 Seminar on Quarternary Studies  
 RPM 554 Forest Recreation Planning  
 ARE 572 Agricultural Trade and Economic Growth

## 4. Rural Resource Management

In Maine, the wise management of rural lands with forests, agriculture, and recreation resources is of considerable value and increasing importance. Many new and interesting careers will be found in this area. For students interested in this field, a diverse knowledge of rural Maine's lands and occupants is essential. A selection of the following courses can provide such a background.

GEO 210 Geography of Maine  
 GEO 214 Geography of Canada and the United States  
 GEO 215 Cultural Geography  
 INT 224 Sociology of Rural Life  
 PSS 144 Soil and Water Conservation  
 ARE 371 Introduction to Natural Resource Economics and Policy  
 INT 324 Contemporary Rural Problems  
 INT 329 The Individual and the Community  
 ARE 471 Resource Economics  
 ARE 474 Land Use Planning  
 ARE 486 Government Policies Affecting Rural America

RPM 554 Forest Recreation Planning  
 ARE 572 Agricultural Trade and  
 Economic Growth

5. Locational Analysis of Economic Activities

One of the primary concerns of geography is that of predicting and explaining the location of economic activities. Factories, stores, warehouses, and other facilities, and the communication and transportation links between them, are not haphazardly placed on the landscape. There are definite reasons why these facilities are where they are, and a knowledge of these reasons is of considerable importance in such matters as industrial expansion, selecting the location of a new store, and planning a transportation system for a town. The following selection of courses address this area of concern.

GEO 210 Geography of Maine  
 GEO 214 Geography of Canada and the  
 United States  
 GEO 215 Cultural Geography  
 GEO 350 Geography of Canada  
 ECO 444 Urban Economics  
 ECO 445 Regional Economics  
 ARE 371 Introduction to Natural Resource  
 Economics and Policy  
 ARE 471 Resource Economics  
 ARE 474 Land Use Planning

6. Geopolitics

The partitioning of land, zoning, the distribution of electoral districts, and the division of the earth's surface into national, regional, and municipal territories all have political significance. The student of politics has much to gain from a clearer understanding of political geography. The following courses are useful in this regard.

GEO 210 Geography of Maine  
 GEO 214 Geography of Canada and the  
 United States  
 GEO 215 Cultural Geography  
 GEO 350 Geography of Canada  
 POS 223 Political Geography  
 POS 233 Urban Politics  
 ARE 474 Land Use Planning  
 ARE 486 Government Policies Affecting  
 Rural America  
 PAA 580 City and Regional Planning

7. Spatial Organization of Society  
 Human occupancy of the land and the

distribution of human groups are highly organized. For example, specific social class groups in the city reside in particular neighborhoods and maintain barriers and distance between themselves and other groups. The spatial organization of society is treated in the following courses:

GEO 210 Geography of Maine  
 GEO 214 Geography of Canada and the  
 United States  
 GEO 215 Cultural Geography  
 GEO 302 Geographical Perspectives on  
 Atlantic Canada  
 GEO 350 Geography of Canada  
 INT 224 Sociology of Rural Life  
 SOC 442 Population and Society  
 INT 324 Contemporary Rural Problems  
 INT 329 The Individual and the Community

## Latin American Studies

### Interdisciplinary Concentration

#### Faculty

Prof. James Acheson, Anthropology, Coordinator, 40B S. Stevens Hall  
 Professor Melvin Burke, Economics, 220 Stevens Hall  
 Assoc. Prof. Eugene DelVeccio, Foreign Languages, 250 Little Hall  
 Asst. Prof. Kathleen Higgin, History, Stevens Hall  
 Assoc. Prof. Laura Luszczynska, Foreign Languages, 216 Little Hall  
 Assoc. Prof. Kathleen N. March, Foreign Languages, 276 Little Hall  
 Assoc. Prof. James Troiano, Foreign Languages, 274 Little Hall

### Rationale

The Latin American course cluster offers a series of courses in foreign languages, anthropology, history and economics concerning Latin America designed to broaden the student's undergraduate education and increase his or her job opportunities.

Although North Americans and Latin Americans share the "New World," they have little understanding of each other. North Americans have reacted to Latin America either by ignoring it, or through the most unfortunate stereotypes.

Latin America cannot be ignored much longer. The area is rich in natural resources (most of the oil used in New England comes

from Venezuela). It also presents a huge market for U.S.-made goods. The area currently is undergoing rapid and sometimes violent social change, as witnessed by the ongoing events in Honduras and El Salvador. Spanish speakers recently have become the largest immigrant group in the United States; and Cuba's Castro is an acknowledged leader of all the countries in the "Third World."

The size and diversity of Latin America make it difficult to comprehend. Brazil alone is larger than the continental United States. Latin American communities range from sparkling modern cities like Caracas and Rio de Janeiro to thousands of rural, traditional hamlets in the Amazon Basin and Central America. Although Spanish and Portuguese are the predominant languages, there are hundreds of different Indian societies, totaling millions of people which have maintained their traditional languages and cultures.

Measured by North American standards, Latin America appears eccentric, inconsistent, and full of surprises. Measured by its own standards, it is orderly, consistent, and comprehensible.

The Latin American Course Cluster combines training in languages, literature, and social sciences to allow students to begin to deal with this very different and increasingly important part of the world. The faculty involved in this course cluster have spent substantial time in Latin America. Several are natives of Latin American countries.

### Course Offerings

A minimum of 18 hours are required for the Latin American Course Cluster.

#### A. Language Competence.

The student must demonstrate proficiency in Spanish at the intermediate level. Proficiency may be demonstrated either by examination or by completing SPA 203/204 with a mark of "B" or higher. Students will not be admitted to the program until they have completed SPA 101/102. Course work in intermediate Spanish (SPA 203/204) will be counted toward the Course Cluster, however. (In the near future Portuguese may be taught.)

#### B. Social Sciences and Literature.

In addition, the student is required to take at least one course in each of the following four areas:

#### History

HTY 447 Latin America: Under the Conquerors

HTY 448 Latin America: Reform and Revolution

HTY 452 Topics in Latin American History

#### Anthropology

ANT 453 Peoples and Cultures of Mesoamerica

ANT 467 Peasant Studies

#### Economics

ECO 438 Economic Development

ECO 436 Marxian Economics

#### Literature

SPA 307 Readings in Peninsular Literature

SPA 308 Readings in Spanish American Literature. Another more advanced course in Latin American literature may fulfill this requirement (SPA 408, SPA 409, SPA 410)

Additional courses in Spanish, Portuguese, Latin American Literature, History, and Anthropology are recommended.

## Legal Studies

### Interdisciplinary Concentration

#### Faculty

Prof. Erling Skorpen, Philosophy, Coordinator,  
4 The Maples

Assoc. Prof. Steven Barkan, Sociology, 201A  
Fernald Hall

Assoc. Prof. R. Brucher, English, 415 Neville  
Hall

Professor Edward Collins, Political Science, 5  
N. Stevens Hall

Assoc. Prof. Edward Lavery, Public Administration,  
1 N. Stevens Hall

Professor Eugene Mawhinney, Political  
Science, 138 N. Stevens Hall

Asst. Prof. Harlan J. Onsrud, Surveying Engineering,  
117A Boardman Hall

Asst. Prof. Robert Steele, Broadcasting, 100 East  
Annex

Professor Jefferson White, Philosophy, 11 The  
Maples

### Rationale

In antiquity, Socrates held that the laws were his "true parent." For then as now, laws help to constitute and regulate family, school, church, commercial, and governmental institutions. They therefore affect the lives of everyone throughout, although conversely human beings make the law. Legal foundations, devel-

opments, and effects are consequently of intrinsic interest and concern to many disciplines and their students. This interdisciplinary course concentration is accordingly designed not so much for the pre-law student, as for any student whose liberal education seeks to understand the formative bases of human civilization and culture.

### Course Offerings

The Legal Studies Curriculum is divided into two clusters as follows:

- A. Courses "About" Law (three to be selected for nine credits)
- ENG 229 Topics in Literature (Law)
  - PHI 444 Philosophy of Law I
  - PHI 445 Philosophy of Law II
  - POS 382 Introduction to Law
  - SOC 314 Law and Society
  - SVE 321 Cadastral Systems
- B. Courses "In" Law (two to be selected for six credits)
- BUA 220 The Legal Environment of Business
  - JBR 370 Law and Ethics: Telecommunications
  - JBR 375 Mass Media Law and Ethics
  - PAA 405 Administrative Law
  - POS 383 Constitutional Law
  - POS 384 Constitutional Law: Civil Liberties
  - PAA 410 Local Government Law
  - POS 387 International Law
  - SVE 221 Legal Aspects of Land Surveying
  - SVE 522 Environmental Law and Resource Regulation

## Linguistics

### Interdisciplinary Concentration

#### Faculty

- Assoc. Prof. Henry Munson, Anthropology, Coordinator, 36B S. Stevens Hall
- Assoc. Prof. Paul Bauschatz, English, 304 Neville Hall
- Professor Jacob Bennett, English, 313 Neville Hall
- Prof. Catherine J. Garvey, Psychology, 286 Little Hall
- Coop. Assoc. Prof. Sharon Jackiw, Foreign Languages, 24 Coburn Hall
- Asst. Prof. Marilyn Kertoy, Speech Communication, 330 Stevens Hall
- Asst. Prof. Mark Kuhn, Speech Communication, 325 Stevens Hall
- Asst. Prof. Rex Pyles, Foreign Languages, 270

Little Hall

Prof. Robert Rioux, Foreign Languages, 214 Little Hall

Professor Jefferson White, Philosophy, The Maples

### Rationale

Linguistics is the field of study concerned with language, both as a general human faculty and as manifested in particular languages. The discipline includes such topics as: the acquisition of language, its sounds, meaning, structure, social and cultural aspects, families and dialects, and change.

The linguistics program entails a minimum of 15 credit hours, as follows:

#### A. Core

At least one course must be completed in each of the following categories for a minimum total of nine credit hours.

##### 1. Introduction

INT 310 Introduction to the Study of Linguistics

##### 2. Language Structure

FOL 453 Phonology  
ENG 477 Modern Grammars

##### 3. Language in Context

INT 380 Sociolinguistics  
ANT 381 Language and Culture  
SPC 380 Language and Speech Development

#### B. Electives

Students may select courses from among the following which, when added to those in the core, will complete the total of 15 credit hours.

ENG 476 History of the English Language  
ENG 579 The Theory of Composition (also listed as SPC 579)

GER 403 History of the German Language  
FRE 420 French Phonetics

FRE 442 French Language of North America

FRE 499 Applied French Linguistics

FRE 500 History of the French Language

FRE 520 French Linguistics

COS 220 Introduction to Computer Science I

COS 221 Introduction to Computer Science II

COS 301 Programming Languages

COS 470 Introduction to Artificial Intelligence

MAT 241 Mathematical Logic

PHI 260 Philosophy of Language

- PHI 450 Logic
- PHI 463 Theory of Knowledge
- PSY 522 Social Development in Children
- SPC 256 The Social Process of Interpretation
- SPC 454 Communication Development in Children
- SPC 405 Women and Communication
- SPC 483 Anatomy and Physiology of the Speech Mechanism
- SPC 484 Introduction to Speech Science
- SPC 585 Children's Language Disorders

The enumeration here is not definitive; new courses, projects, special seminars, or pertinent reading in upper honors courses may be approved for this program.

*Note:* The three areas for B.A. distribution requirements are represented among the courses listed for this concentration. Working towards a concentration in linguistics is, therefore, compatible with satisfying distribution requirements for the B.A. degree.

Although one may fulfill the minimum requirements by taking five courses from Category A and none from Category B, it is expected that students will choose one or more of the elective courses.

## Marine Resources

### Interdisciplinary Concentration

#### Faculty

Professor Robert Bayer, Animal and Veterinary Sciences, Coordinator, Hitchner Hall

The Interdisciplinary Course Concentration in Marine Resources consists of an introductory "core" amounting to eight credit hours, plus an additional 10 or more credit hours of advanced courses, chosen to include at least TWO courses selected from ONE of two areas of specialization, as listed below, or other courses approved by the coordinator.

#### Course Offerings

(Course prerequisites are given in parentheses.)

#### MARINE RESOURCES CORE:

- ANV 220 Topics in Marine Resources 2
  - OCE 370 Introduction to Oceanography (Permission) 3
  - ARE 471 Resource Economics (ECO 110) 3
- OR

- INT 360 Economics and the Biology of Marine Fisheries Management (ECO 420, ZOL 204 or permission) 3

#### MARINE RESOURCE UTILIZATION:

- INT 319 General Ecology (1 year of college chemistry and 1 year of college biological science)
- ARE 371 Introduction to Natural Resource Economics and Policy
- ARE 577 Economics of Public Choice (ECO 420) 3
- MCB 515 Marine Bacteriology (General Chem., Gen. Micro.) 3
- MCB 520 Fish Diseases (MCB 300, 301 or permission) 4
- ANV 212 Maine Mariculture (permission)\* 3
- ZOL 470 Fishery Biology (ZOL 329, INT 319 or WLM 200) 3
- ANV 211 Aquaculture 3
- ANV 409 Shellfisheries Biology (ZOL 443, or permission) 3
- ZOL 573 Fisheries Science (ZOL 470 and 471 or permission) 2
- BOT 473 Biology of Algae (BIO 100, BOT 203) 4
- BOT 474 Aquatic Flowering Plants (BOT 464 or permission) 2
- BOT 475 Algal Growth and Seaweed Mariculture (BIO 100, 1 yr Biology and 1 yr Chemistry) 3
- BOT 503 Natural History and Ecology of Marine Algae (INT 319 or Bot 473 or equivalent) 4

#### MARINE TECHNOLOGY:

- AEN 469 Agricultural Process Engineering (MEE 230, 360, or CIE 350) 3
- AEN 550 Simulation of Biological and Physical Systems (MAT 126, Fortran) 3
- CIE 458 Coastal Engineering (CIE 350) 3
- CIE 558 Advanced Coastal Engineering (MAT 259) 3
- CIE 559 Numerical Modeling of Lake and Estuarine Processes (MAT 259) 3

In addition to the courses listed, Co-op Education and special problems (available in each department) may be included in the 10-credit hours of courses required beyond the core. However, inclusion of these courses requires the

*advance written approval of the Coordinator of the Concentration in Marine Resources.*

## Marxist/Socialist Studies

### Interdisciplinary Concentration

#### Faculty

Prof. Douglas Allen, Philosophy, Coordinator,  
The Maples

Prof. Robert Babcock, History, 200B Stevens  
Hall

Assoc. Prof. Steven Barkan, Sociology, 201 Fern-  
ald Hall

Prof. Richard Blanke, History, 115C Stevens  
Hall

Assoc. Prof. Robert A. Brinkley, English, 209  
Neville

Professor Melvin Burke, Economics, 220  
Stevens Hall

Asst. Prof. Valerie Carter, Sociology, 201 Fern-  
ald Hall

Asst. Prof. Jacques Ferland, History, 275C  
Stevens Hall

Assoc. Prof. Alexander Grab, History, 265A  
Stevens Hall

Professor Burton Hatlen, English, 309 Neville  
Hall

Assoc. Prof. Michael Howard, Philosophy, The  
Maples

Professor Abul Huq, Economics, 240 Stevens  
Hall

Asst. Prof. Ngo Vinh Long, History, 200C  
Stevens Hall

Prof. Mark A. Lutz, Economics, 250 Stevens  
Hall

Professor Kyriacos Markides, Sociology, 210  
Fernald Hall

Assoc. Prof. Virginia Nees-Hatlen, English, 311  
Neville Hall

Assoc. Prof. Jana Sawicki, Philosophy, The  
Maples

Professor Howard Schonberger, History, 265C  
Stevens Hall

Prof. Charles Scontras, Modern Society, 111  
East Annex

Assoc. Prof. James Warhola, Political Science,  
23 North Stevens

### Rationale

The Marxist/Socialist Course Cluster encourages students to look at the world from a Marxist/Socialist perspective. Many departments offer approaches which have their foundation in the work of such economic theorists as Adam Smith and such political philosophers as Thomas Hobbes and John Locke. Such ap-

proaches seem to assume that capitalist values are "natural," "according to human nature," progressive, just, or simply the only way that rational people would view the world. Marxism challenges such assumptions and judgments and such a world outlook.

As an approach to history and society, Marxism places primacy on the mode of production and the division of labor and sees class struggle as the primary force of historical development. Such an alternative Marxist/Socialist perspective allows students to take seriously such concepts as imperialism, analyzed as an outgrowth of capitalism on a global scale. Such an alternative perspective will examine various analyses of the state and will allow students to approach the state not as some "neutral" entity but as the result of class conflict and as basically reflecting the class interests of those who hold power in any society.

Finally, Marxism is an invitation to examine basic concepts of rationality and objectivity in a different light. Marxism rejects the claim by other approaches to be "value-free" and "neutral." The Marxist/Socialist alternative will maintain the unity of theory and practice and the position that all approaches, either explicitly or implicitly, reflect value assumptions and judgments and a specific world outlook.

### Course Offerings

The organizers of the Marxist/Socialist Course Cluster recognize that there are many courses offered at the University which allow a student to gain insight into various dimensions of Marxism, socialism, and anti-imperialism, and which are not presented from a Marxist or Socialist perspective.

The "core courses" approach their subject matter from a Marxist/Socialist perspective. The "elective courses" either do not deal primarily with Marxism, socialism, and anti-imperialism or they treat the theory or practice of Marxism/Socialism as an object of study but not necessarily from a Marxist/Socialist perspective.

All students who elect the Marxist/Socialist Course Cluster should take PHI 442, Marxist Philosophy: From Marx to Mao, and at least three other courses from the "core courses" and two courses from the "elective courses." In addition, these courses should be taken from at least three different disciplines.

### CORE COURSES:

#### Economics

ECO 110 Introduction to Economics

ECO 431 Contemporary Alternatives in Political Economy  
 ECO 436 Marxian Economics  
 ECO 438 Economic Development  
 ECO 570 Advanced Topics in Alternative Economic Theory

### History

HTY 467-368 20th Century U.S. History  
 HTY 473-374 American Diplomatic History

### Philosophy

PHI 106 Social Issues in Recent Religious and Philosophical Thought  
 PHI 442 Marxist Philosophy: From Marx to Mao  
 PHI 443 Twentieth Century Marxist Philosophy

### Sociology

SOC 343 Sociology of Work and Labor  
 SOC 460 Major Ideas in Sociology  
 ELECTIVE COURSES:

### Economics

ECO 435 History of Economic Thought  
 ECO 437 Comparative Economic Systems

### English

ENG 429 Topics in Literature: Race, Class, and Gender in 20th Century American Literature  
 ENG 453 The Works of Shakespeare  
 ENG 456 The English Romantics

### History

HTY 272 The Industrial Worker in America  
 HTY 407 The Age of Revolution, 1789-1860  
 HTY 409 Twentieth Century Europe, 1919 to Present  
 HTY 424 History of Russia II  
 HTY 441 History of Modern China  
 HTY 482 Canada and the American Economy  
 HTY 499 Contemporary Problems in History (The U.S. and Vietnam)

### Modern Society

MOY 102 Modern Society

### Philosophy

PHI 439 Feminist Theory  
 PHI 441 Philosophical Foundations of Social and Political Institutions: Hobbes to Marx  
 PHI 465 Topics in Philosophy: Freedom, Equality and Community  
 PHI 465 Topics in Philosophy: Democracy, State and Society

### Political Science

POS 336 The Communist Government of the Soviet Union  
 POS 478 Foreign Policy of the Soviet Union

### Sociology

SOC 101 Introduction to Sociology  
 SOC 202 Social Problems  
 SOC 313 Deviant Behavior  
 SOC 314 Law and Society

### Medieval Studies

#### Interdisciplinary Concentration

##### Faculty

Asst. Prof. Linne R. Mooney, English, Coordinator, 217 Neville Hall  
 Asst. Prof. Karen-Edis Barzman, Art History, 151 Carnegie Hall  
 Assoc. Prof. Cathleen Bauschatz, Foreign Languages, 252 Little Hall  
 Assoc. Prof. Paul Bauschatz, English, 403 Neville Hall  
 Prof. Jacob Bennett, English, 313 Neville Hall  
 Assoc. Prof. Jay Bregman, History, 115B Stevens Hall  
 Assoc. Prof. Evelyn Newlyn, English and Women's Studies, 125 Shibles Hall  
 Asst. Prof. Kristina Passman, Classics, 254 Little Hall  
 Prof. Robert Rioux, Foreign Languages, 214 Little Hall  
 Asst. Prof. Theresa Sears, Foreign Languages, 258 Little Hall  
 Assoc. Prof. William TeBrake, History, 275B Stevens Hall  
 Assoc. Prof. Reinhard Zollitsch, Foreign Languages, 262 Little Hall

#### Rationale

Among historic periods, the Middle Ages seem to offer the greatest contrast to our present age. This contrast may broaden our sense of the human condition and clarify the nature of our experience. The Middle Ages also constitute the earliest phase of our modern civilization in terms of language and art, historic awareness, religion, philosophy, and politics. By examining the Middle Ages from various humanistic points of view, we should develop a sense of both the variety and coherence of this period, and through this experience a fuller understanding of our own times.

#### Course Offerings

The Medieval Studies concentration consists of

a minimum of fifteen credit hours or five courses. The student who elects this concentration normally begins with an introduction to the Middle Ages by taking HTY 105 or HTY 202, only one of which may be included in the concentration. Thereafter, the student takes one other course in the History area, such as HTY 403 or HTY 404, and the remaining three courses in two or three of the other areas below in which medieval courses are offered. The enumeration of courses here is not definitive; new courses, special seminars, pertinent reading in upper honors courses, and independent studies may be approved for the concentration. Students are encouraged to explore as many different approaches to the Middle Ages as possible.

### English

ENG 231 (FOL 231) Western Tradition in Literature: Homer through the Renaissance  
 ENG 251 English Literature Survey: Beginnings Through Neoclassicism  
 ENG 451 Chaucer and Medieval Literature  
 ENG 476 History of the English Language  
 ENG 551 Medieval English Literature

### Foreign Languages and Classics

FRE 404 Medieval and Renaissance French Literature  
 FRE 504 Seminar in Medieval and Renaissance Literature  
 LAT 482 Medieval Latin  
 SPA 425 Medieval Spanish Literature

### History

HTY 105 History of European Civilization I  
 HTY 202 Medieval Civilization  
 HTY 402 Roman History  
 HTY 403 Early Middle Ages  
 HTY 404 Late Middle Ages  
 HTY 427 European Intellectual History I

### Philosophy

PHI 411 Medieval Philosophy  
 PHI 482 The New Testament and Early Christianity

### Peace Studies

#### Interdisciplinary Concentration

##### Faculty

Assoc. Prof. Michael Howard, Philosophy, Coordinator, The Maples

Assoc. Prof. Christina Baker, English, Dow  
 Assoc. Prof. John Battick, History, 275A Stevens  
 Prof. Edward Collins, Political Science, 15 North Stevens  
 Assoc. Prof. Kathryn Grzelkowski, Sociology, 201B Fernald  
 Prof. Abul M. Huq, Economics, 240 Stevens  
 Assoc. Prof. Naomi Jacobs, English, 215 Neville  
 Prof. Peter Kleban, Physics, 222 Bennett  
 Prof. Mark Lutz, Economics, 250 Stevens  
 Prof. Kyriacos Markides, Sociology, 210 Fernald  
 Prof. Ruth Nadelhaft, English, 115 Dow  
 Asst. Prof. Michael Palmer, Political Science, 31 North Stevens  
 Prof. Walter Schoenberger, Political Science, 33 North Stevens  
 Prof. Howard Schonberger, History, 265A Stevens  
 Prof. David Smith, History, 175 Stevens  
 Lect. Robert Whelan, English, Alumni Hall  
 Assoc. Prof. William Whitaker, Social Work, 201F Fernald  
 Asst. Prof. Stephanie Wood, History, 170 Stevens

#### Rationale:

The Peace Studies Program at the University of Maine focuses on research and study about basic issues confronting humankind as it moves toward to the twenty-first century, especially the problem of violence defined in psychological, economic, political and ecological terms. It seeks to understand violence and its causes, to explore short- and long-term strategies for eliminating the causes of violence and to develop skills for peaceful resolution of conflict. By encouraging individuals to act on their understanding of the causes of violence, it seeks the creation of a more peaceful society and world.

The program takes an interdisciplinary, global and internationalist approach to: threats of force and use of force in international relations, including the arms race and external involvement in civil wars; international law and organization; human rights, defined in the broadest sense; oppression of and discrimination against social groups based upon gender, race, class, religion, and nationality; political oppression in general and economic exploitation of developing countries; and the deterioration of the world environment.

The Peace Studies Program hopes to infuse concerns for peace into the campus community and, beyond the boundaries of the campus, to



join with the people of Maine in sharing information and skills in the pursuit of peace.

### Course Offerings:

The Peace Studies concentration consists of a minimum of 18 credits or 6 courses. At least 4 of the courses must be among those designated "core" courses, and must be chosen from at least 3 distinct departments. No more than 3 of the 6 minimum courses can be from the same department. Core courses are those that make the meaning, criteria, or conditions of peace the central theme. Courses which are important for an understanding of peace, but in which peace is not central, may be included in the course concentration, but are not core courses.

New courses are currently being reviewed for inclusion in the Peace Studies concentration.

### Core Courses

#### English

ENG 429 Topics in Literature: Literature of the Vietnam War (R. Whelen)

#### History

HTY 473 American Diplomatic History I (H. Schonberger)

HTY 474 American Diplomatic History II (H. Schonberger)

#### Interdisciplinary

INT 290 Nuclear War (P. Kleban, et al) (1 cr.)

#### Political Science

POS 373 International Relations (W. Schoenberger)

POS 387 International Law (E. Collins)

POS 388 World Order Through International Organization and Law (E. Collins)

#### Sociology

SOC 308 Problems of Violence and Terrorism (Markides)

SOC 338 Race and Culture Conflict (V. Carter)

### Elective Courses

#### Economics

ECO 430 Humanistic Economics (M. Lutz, A. Huq)

#### English

ENG 429 Topics in Literature: Utopian Literature (N. Jacobs)

#### History

HTY 280 Naval History (J. Battick)

HTY 467 Early 20th Century America, 1914-1945 (D. Smith)

#### Philosophy

PHI 106 Social Issues in Recent Religious and

Philosophical Thought (D. Allen)

PHI 443 Twentieth Century Marxist Philosophy (D. Allen)

#### Political Science

POS 121-122 Current World Problems (W. Schoenberger)

POS 573 Problems in International Politics (Schoenberger)

POS 587 Problems in International Law (Collins)

POS 594 Topics in Political Theory: Thucydides (Palmer)

#### Sociology and Social Work

SWK 375 Hunger as an Issue in Social Welfare (Whitaker)

SOC 369 Collective Behavior and Social Movements (S. Barkan)

SOC 465 Evolution, Revolution and the Future (K. Grzelkowski)

Students enrolled in the University College Liberal Studies program may initiate course work toward a Peace Studies Concentration by taking the following courses (not available to students enrolled in a baccalaureate degree program):

#### Core Course:

Eng 185A Introduction to Mythology (Nadelhaft/Baker)

#### Elective Courses:

HUM 201A Literature and the Exploration of Human Values (Nadelhaft)

ENG 255A Women in Literature (Nadelhaft)

To complete the concentration, students will need to transfer from Liberal Studies to a baccalaureate degree program. The above Liberal Studies courses will be evaluated on the basis of transfer policies of the college in which they are enrolled for a Bachelor's degree. If the courses are accepted by the college, they will count toward the completion of the concentration.

### Public Relations

#### Interdisciplinary Concentration

##### Faculty

Assoc. Prof. Warren Burns, Speech Communication, Coordinator, 340 Stevens Hall  
Assoc. Prof. Richard Brucher, English, 415 Neville Hall

Assoc. Prof. Arthur Guesman, Journalism, 107 Lord Hall

Assoc. Prof. Naomi Jacobs, English, 215 Neville Hall

Inst. Sheila Pechinski, Business Administration, 6B South Stevens

### Rationale

Through the Interdisciplinary Course Clusters program, UM students can build a concentration in Public Relations.

As public and private organizations have grown larger and more complex, the need to communicate with clients, constituents, and the general public has become more crucial. All organizations try to present themselves favorably to others, and most need to solicit acceptance of their ideas, services, and products. Some public relations concepts call simply for the presentation of a favorable image of the organization. Others actively attempt to shape public opinion in order to further the programs, ideals, and other interests of the organization. Individuals, staffs, and even entire departments now specialize in public relations, and a body of knowledge and skills have grown around the total concept.

The Public Relations Course Cluster provides students with a basic program for entering the broad field of public relations. Courses included in the program outlined below should help the student develop and apply communication skills. The cluster requires a minimum of 15 credits, distributed as follows:

### Course Offerings

#### A. Core

At least three graded courses must be completed in this category, one from each subcategory. Pass-fail grading is not acceptable, nor are grades below C-(Course prerequisites are given in parentheses).

1. Speech Communication in Public Relations  
SPC 257 Business and Professional Communication (SPC 102, 103 or 106)  
SPC 267 Public Relations: Oral Communication Strategies (SPC 257 or permission)
2. Journalism in Public Relations  
JBR 231 Reporting and Newswriting (ENG 101)  
JBR 250 Introduction to Advertising
3. English in Public Relations  
ENG 317 Technical Writing (ENG 101)  
ENG 417 Technical Writing and Editing (ENG 317 or permission)

#### B. Electives

To go beyond the 15-credit minimum, stu-

dents may choose courses from this category. The list is not definitive; new courses, seminars, field experiences, and other projects may be approved for the program.

- BUA 325 Principles of Management and Organization (6 credits in ECO and Junior standing)
- BUA 330 Personnel Management and Industrial Relations (6 credits in ECO, PSY 100 and Junior standing)
- BUA 326 Dynamics of Organization and Behavior (BUA 325)
- BUA 372 Advertising (BUA 370)(May not be combined with JBR 250)
- ENG 301 Advanced Composition (ENG 212 or permission)
- ENG 496 English Apprenticeship (Field Experience; 24 credits in ENG including JBR 232 Public Affairs Reporting (ENG 212 or 317 and permission)
- JBR 355 Advertising Copywriting and Layout (JBR 250)
- JBR 489 Seminar - Media Ethics and Issues (Senior JBR majors, or permission)
- PAA 200 Public Management (PAA 100 or POS 100)
- POS 358 Public Opinion (POS 100, Junior standing)
- SPC 277 Interviewing (SPC 102, 103 or 106)
- SPC 496 Field Experience in Speech Communication (speech communication majors only, with 2.5 in SPC, and 9 credits above 100 level in Speech Communication, and permission of committee)
- SPC 470 Communication in Organizations (Junior or Senior standing)

Although students may fulfill the minimum requirements by taking five courses from Category A and none from Category B, they are expected to choose one or more of the electives. *Students may take one course only from within their major.*

## Religious Studies

### Interdisciplinary Concentration

#### Faculty

- Assoc. Prof. Jay Bregman, History, Coordinator, 115B Stevens Hall
- Prof. Douglas Allen, Philosophy, The Maples
- Prof. Richard G. Emerick, Anthropology, 52AS Stevens Hall
- Prof. Burton N. Hatlen, English, 309 Neville Hall
- Prof. Kyriacos Markides, Sociology, 210 Fernald Hall

Assoc. Prof. Henry Munson, Anthropology, S.  
Stevens Hall

Assoc. Prof. John R. Wilson, English, 205  
Neville Hall

### Rationale

Traditionally, questions about the ultimate meaning of human existence have been posed in the form of religion. Courses included in the religious studies cluster are designed to help students understand what these questions are, what kind of answers people have found to them, and how societies have given institutional form to the world-views which emerge from the answers. A student who elects this cluster should develop an awareness of the broad range of religious phenomena and an ability to analyze and elucidate the significance of such phenomena. All students who elect this cluster should begin by taking PHI 105, Introduction to Religious Studies. Thereafter the student should take at least four courses from one of the following subclusters: i.e., four courses from "A," or four courses from "B," or four courses from "C," or four courses from "D." These courses should be taken from at least three different disciplines.

### Course Offerings

#### A. Religion in the Development of Western Civilization

PHI 108 Biblical Thought

PHI 411 Medieval Philosophy

PHI 482 The New Testament and Early Christianity

PHI 483 The Reformation and the Enlightenment

HTY 403/304 The Middle Ages

HTY 405 The Renaissance and Reformation

HTY 427/328 European Intellectual History

HTY 499 Contemporary Problems in History (Greek & Roman Religion & Mythology)

ENG 241 American Literature Survey: Beginnings Through Romanticism

ENG 457 Nineteenth Century Fiction, Poetry and Essay

#### B. Theoretical Perspectives on Religion

PHI 481 The Nature of Religious Experience

PHI 490 Topics in Religious Studies

ENG 429 Topics in Literature: The Traditional Theory of Literature

SOC 482 Sociology of Religion

#### C. Religion in the Non-Western World

PHI 486 Religions and Philosophies of the East: Hinduism

PHI 487 Religions and Philosophies of the East: Buddhism

HTY 435/336 History of China

HTY 437 History of Modern Japan

ANT 441 People and Cultures of the Pacific Islands

ANT 451 North American Indian Ethnology

ANT 453 Peoples and Cultures of Mesoamerica

ANT 454 Cultures and Societies of the Middle East

ANT 460 Peoples and Cultures of the Circumpolar Area

ANT 461 Islamic Fundamentalism

#### D. Religion in the Contemporary World

PHI 106 Social Issues in Recent Religious and Philosophical Thought

PHI 485 Recent Religious Thought

ENG 429 Topics in Literature: Tolkien and Modern Fantasy

### Business Administration (B.S. Degree)

Accounting  
Finance

Management  
Marketing

### Education ( B.S. Degree)

Elementary Education

Secondary Education

Art Education  
Physical Education  
and Recreation

### Engineering and Science (B. S. Degree)

Chemical Engineering

Chemistry  
Civil Engineering

Computer Engineering

Construction Management Technology

Electrical Engineering

Electrical Engineering Technology

Engineering Physics

Mechanical Engineering

Pulp & Paper Technology

Surveying Engineering

## School of Engineering Technology

### (B. S. Degree)

Construction Management Technology  
 Electrical Engineering Technology  
 Mechanical Engineering Technology

### (Associate Degree)

Civil Engineering Technology  
 Electrical Engineering Technology  
 Mechanical Engineering Technology

## Forest Resources (B.S. Degree)

Forest Engineering (jointly with College of Engineering and Science)  
 Forestry  
 Recreation and Park Management

Wildlife Management  
 Wood Technology  
 Forest Management Technology (Associate Degree)

## Life Sciences and Agriculture (B.S. Degree)

Agriculture  
 Animal Sciences (includes pre-vet)  
 Agribusiness and Resource Economics  
 Bio-Resource Engineering (jointly with College of Engineering & Science)  
 Biochemistry (including pre-med)  
 Biology (including pre-med)  
 Botany  
 Child Development/Family Relations  
 Entomology  
 Food and Nutrition

Food Science  
 Health and Family Life Education  
 Home Economics  
 Hotel, Restaurant and Tourism Administration  
 Landscape Horticulture  
 Microbiology (including pre-med)  
 Molecular and Cellular Biology  
 Natural Resources  
 Nursing  
 Plant & Soil Sciences  
 Production and Processing Technology

## Technical Division (Associate Degree)

Agricultural Mechanization Technology\*\*  
 Animal Agriculture Technology  
 Animal Medical Technology  
 Landscape and

Nursery Management  
 Merchandising  
 Resource & Business Management\*\*  
 Business Management

\*\*Two-plus-two-program. Qualified students may continue for two additional years to receive a baccalaureate degree.

## University College (Associate Degree)

Dental Hygiene  
 Health Information Technology  
 Hotel, Restaurant and Tourism Management  
 Human Services (Chemical Addiction Counseling, Child and Youth Services,

Developmental Disabilities, Gerontology, Mental Health Technology)  
 Legal Technology (One-year Certificate Program)  
 Dental Assisting  
 Liberal Studies

## Graduate Degree Programs

### Doctor of Philosophy

Biological Sciences  
 Chemical Engineering  
 Chemistry  
 Civil Engineering  
 Forest Resources  
 Geological Sciences  
 History  
 Individualized Programs

Nutritional Sciences  
 Oceanography  
 Physics  
 Plant Sciences  
 Psychology  
 Surveying Engineering  
 Wildlife  
 Zoology

### Doctor of Education

**Master of Arts with major in one of the following**

Economics*	Mathematics*
Education	Psychology
English*	Speech Communication*
French	Theatre*
History*	
Liberal Studies*	

\*Indicates non-thesis option.

**Master of Science with major in one of the following**

Agricultural and Resource Economics	Food Science
Animal Sciences	Forestry
Bio-Resource Engineering	Geological Sciences
Biochemistry	Human Development
Botany and Plant Pathology	Mechanical Engineering
Chemical Engineering	Microbiology
Chemistry	Oceanography
Civil Engineering	Physics
Community Development	Plant and Soil Sciences
Computer Science	Quaternary Studies
Education	Resource Utilization
Electrical Engineering	Surveying Engineering
Entomology	Wildlife Management
	Zoology

**Professional Programs**

Certificate of Advanced Study

**Master of Arts in Teaching with major in one of the following:**

French  
German  
Spanish

**Master of Business Administration****Master of Education****Master of Engineering****Master of Forestry****Master of Music****Master of Professional Studies with major in one of the following:**

Agricultural and Resource Economics	Biochemistry
Animal Sciences	Community Development
	Microbiology

**Master of Public Administration****Master of Science in Medical Technology****Master of Social Work****Accreditation**

The University of Maine is accredited by the New England Association of Schools and Colleges. In addition, many of the University of Maine's professional programs and departments are accredited by national professional associations, including:

Accreditation Board for Engineering and Technology  
American Assembly of Collegiate Schools of Business  
American Chemical Society  
American Dental Association Commission on Dental Accreditation  
American Home Economics Association  
American Psychological Association  
American Veterinary Medical Association  
Committee on Allied Health Education and Accreditation in cooperation with the American Medical Record Association  
Council on Social Work Education  
Council for Standards in Human Service Education  
National Association of Schools of Art and Design  
National Association of Schools of Music  
National Association of Schools of Public Affairs and Administration  
National Council for Accreditation of Teacher Education  
Society of American Foresters

**The Bureau of Public Administration**

The Bureau of Public Administration was established in 1965 by Act of the 102nd Maine Legislature for the purpose of improving the quality of public administration in the State of

Maine. As an integral part of the Department of Public Administration the bureau provides applied research on public policy/program issues, management training and development, and consultation services to assist Maine state and local governments. In addition, the bureau publishes reports, articles, newsletters and manuals related to the field of public administration as well as particular issues facing Maine's public administrators.

## Other Facilities and Services

### The Conferences and Institutes Division

Established in 1973, this office brings together groups of participants and qualified resource people to share information and ideas, develop new skills and insights, and seek solutions to current problems. Each year over 30,000 people participate in more than 300 conferences, meetings, seminars, workshops, short courses, institutes, and symposia. The office is located in Chadbourne Hall.

### The Canadian-American Center

The Canadian-American Center coordinates the broad range of Canadian and cross-border studies at the University of Maine. Located at 154 College Avenue, the Center houses seminar rooms, research space for visiting faculty and administrative offices of the University of Maine's National Resource Center for Canada.

### The Instructional Systems Center

The Instructional Systems Center is a service organization designed to assist faculty and staff with instruction and presentations. To achieve this end, the Center is organized into five divisions. The Instructional Development Division assists in writing objectives, test items, consultation on the preparation and use of audio, video, and graphic instructional materials. The Micro Division includes management of three general use microcomputer clusters (CAPS, Memorial Union, Fogler Library) and consultation to novice microcomputer users at these locations. In addition, this division assists students, faculty, and staff with personal purchases of microcomputers. The Equipment Division provides audio-visual equipment, e.g., slide projectors, video cassette players, etc.,

and repairs campus-owned AV equipment, including computers. The Product Division creates a variety of graphic, photographic, audio, and video instructional materials and consults with those seeking to produce these products. The Film Division serves as a resource for faculty who are trying to locate film or video titles for instructional use. Many titles appropriate for campus use may be found in the ISC Film/Video Library.

### The Libraries

The Raymond H. Fogler Library, on the Orono campus, faces the south end of the Mall with another entrance opposite the Memorial Union. It is the largest library in Maine. It contains an excellent collection of general materials to support undergraduate and graduate studies as well as rich and varied research collections including: 660,000 volumes, 5,200 periodical subscriptions, more than 1,000,000 microforms, and more than 1,450,000 U.S. and Canadian federal government publications. Specialized collections include Maine-related materials, sound recordings and music scores, maps, manuscripts, and educational materials (book and audiovisual) for teachers and students. Students and faculty have access to electronic databases for computerized literature searching in the Information Services Department and the Science and Engineering Center. Zenith and APPLE microcomputers are available for use at no charge.

The University College Library, located in Eastport Hall on the Bangor campus, contains a collection of books and audiovisual materials supporting the curriculum of the college. The library at the Ira C. Darling Center in Walpole houses a specialized collection of books, journals, and reprints devoted to Marine Studies.

### The University of Maine Museum of Art

The University of Maine Museum of Art is the new name for the University of Maine Art Collection, a vital visual arts institution on the Orono campus of the University of Maine system. Founded in 1946, the University of Maine Museum of Art is one of the earliest and most distinguished land grant University art collections in the United States. The permanent collection of over 4,500 works includes a wide variety of prints and paintings by such artists as George Inness, Daumier, Picasso, Sims,

Piranesi, Kollowitz, Wesselman, and Dine. The Museum's focus is on Modern and Contemporary nationally and internationally recognized artists.

The Museum mounts approximately six major shows a year in its two galleries, the 1938 Gallery and Carnegie Gallery. Work is also displayed in Hauck Gallery and the Graphics Gallery in the Memorial Union. In addition to exhibitions, work is displayed in the Campus Collection, a collection of work in a museum without walls - the university campus. Over 2,000 works of art are displayed in residential, academic and administrative buildings through the Campus Collection.

The only fine arts institution owned by the people of the State of Maine, the University of Maine Museum of Art offers its resources in outreach programming, from PEP (Public Exhibition Program) traveling shows, Maine Arts Dialogue, a program designed to unite those involved in the visual arts, to extensive museum education.

### Planetarium and Observatory

The planetarium and observatory are operated by the Physics and Astronomy Department for the benefit of students and the general public by a director and a staff of students from all areas of the University. The Planetarium on the second floor of Wingate Hall offers a variety of public star shows throughout the year that are free to University students and it is available for special group showings for departments, clubs and area schools. The observatory in the domed building next to the Memorial Union contains a vintage Alvan Clark refractor telescope, and everyone is welcome to stop in when staff operators open it on clear nights.

### The Hudson Museum

The Hudson Museum is located in the Maine Center for the Arts on the UM campus. The Anthropology Museum, formerly located in South Stevens Hall, has been incorporated into this new facility. The new museum's collection is still largely, but not exclusively, anthropological. The new facility is many times larger and the collection, already very extensive, can be much more adequately exhibited and its scope expanded. It will continue to function as a teaching and research aid not only for University students, but also for the community at large.

The Hudson Museum's permanent collec-

tion includes one of the finest assemblages of pre-Columbian Mexican and Central American materials in this country. The collection also includes materials from the Native Americans of the Northwest Coast area, Plains and Eastern Indians, Ecuador, the Arctic, Oceania, Asia and Africa. Visiting exhibits will be regularly brought to the museum to supplement the permanent collection. Regular hours are Tuesday-Friday, 9:00 to 4:00; Saturdays, 9:00 to 3:00; and Sundays 11:00 to 3:00. Admission is free for visitors, but donations are encouraged. Groups may expect a modest charge and admission fees may sometimes be charged for special exhibits. For further information call 581-1901.

### The Northeast Archives of Folklore and Oral History

The Northeast Archives of Folklore and Oral History, a part of the Anthropology Department, is located in the basement of South Stevens Hall. It is a research facility and a repository for tape recordings, transcripts of tapes and related photographs and manuscript material relevant to the folklore and folklife of Maine and the Maritime Provinces of Canada.

### Women in the Curriculum Program

The mission of the Women in the Curriculum Program (WIC) is to improve the quality of education for all students by helping to ensure that the experiences and perspectives of women are part of the University curricula. To this end the WIC office, which reports to the Vice President for Academic Affairs, administers an Interdisciplinary Concentration in Women's Studies and continues a longstanding effort toward curriculum integration, that is, the infusion of material on women into the University's existing courses so that they are sex and gender balanced.

To assist the Women's Studies program and the curriculum integration effort, the WIC office provides small grants for curriculum development and for research projects that are consistent with WIC goals. The WIC office is also responsible for implementing the University's nonsexist language policy, and shares with the Equal Opportunity office responsibility for efforts in aid of women's development.

Additional WIC programs include the weekly presentations in the WIC Lunch Series, the University's annual celebration of Wo-

men's History, the Maryann Hartman Awards to Maine women of achievement, guest speakers, and a variety of other projects and events intended to assist the university in providing a full education for its students.

### Services for Students with Disabilities (Onward Program)

Services for Students with Disabilities facilitates the education of students with disabilities by providing a point of coordination for any special services they may need while attending UM.

Some of the services provided or coordinated through Services for Students with Disabilities are: advising, special orientation to campus, readers, recorders, tutors as needed, the ordering of taped texts, classroom relocation, lift keys, priority registration, mediation and advocacy, as well as personal, educational, and vocational counseling.

Services for Students with Disabilities, located in the Onward Building, will be happy to supply further information and answer questions. Students with special needs are urged to contact the Counselor/Coordinator of Services for Students with Disabilities, Onward Building, UM, Orono, ME 04469. Phone (207) 581-2320.

### Office of University Retention Programs

The Office of Student Retention Programs, established in 1986, works to help students remain at the University of Maine until their educational goals are reached. It does so in several significant ways. First, it interviews students leaving school prematurely to ascertain the reasons for their departure. It also conducts other research on patterns of student withdrawal from school. Based on the results of this research, programs are developed and recommended for implementation.

Because of its importance to student retention, the quality of the first-year experience at the University receives special emphasis from this office. In this regard, it works with the University as a whole and with the separate colleges to improve this experience by easing the transition from high school to college and by enriching the first year with programs designed to make students aware of the full range of opportunities available at the University. Acting as a student advocate, the Office also works in conjunction with the colleges to im-

prove services, such as academic assistance and advising, which clearly have an impact on student inclination to achieve educational goals.

Additionally, the office is responsible for listening to student problems, helping students with them and assessing their significance to the ability of students to remain in school. Problem solving such as this can focus on the individual, but it can also focus on systemic causes and solutions to the attrition problem which affects a broad range of students.

In short, the Office of University Retention Programs addresses both University-wide and individual student programs which affect the rate at which students are able to realize academic success. By solving these problems, the office aims to improve the student success rate as well as improve the quality of the University experience.

### Office of Research and Public Service

This office has the responsibility for planning, coordinating and administering the program of organized research and public service of the University of Maine. The objective is accomplished through procedures designed to

- A. Coordinate the research and public service efforts of the colleges and other units of UM with the goal of developing effective inter-relationships between staff functions and projects.
- B. Develop long-range goals and objectives for the research and public service programs of UM and provide faculty and staff members with the opportunity to contribute to planning, establishing and implementing such goals.
- C. Provide increased opportunity for faculty and staff members to participate in programs of research and public service by promoting multidisciplinary and interdisciplinary approaches to solving identified problems. Comprehensive and timely information on grant support is made available on a continuing basis.

Following is a list of current organized research and public service units operating at UM.

### The Maine Agricultural Experiment Station

The Maine Agricultural Experiment Station has been undertaking research for Maine and its people for more than one hundred years. Orig-



inally devoted to research for Maine's farm community, now the Experiment Station has central responsibility in the state for research in agriculture, forest resources, and rural economic development. To accomplish this mission the Experiment Station maintains its offices and principal research laboratories at Orono. Additional research facilities include Aroostook Farm at Presque Isle, Highmoor Farm in Monmouth, Blueberry Hill Farm in Jonesboro, Witter Animal Science Center at Orono, and the DeMerritt Forest at Orono. More than one hundred scientists participate in research programs designed to apply the techniques of modern science to the needs of Maine. This commitment to relevance is seen in both applied and basic programs in agriculture, forestry, wildlife, human nutrition, food technology, fisheries and aquaculture, community economic development, plant and animal biology, and family living. Two public advisory committees, the University of Maine Agricultural Advisory Committee and the Forest Resources Research Advisory Committee, provide advice in the development and oversight of the research programs.

### Sponsored Programs Division

The Sponsored Programs Division provides support services to faculty and staff seeking extramural funding for research, teaching, or public service projects, and to those who direct extramurally funded projects. On behalf of the University, SPD oversees the submission of proposals and shares with the Principal Investigator or Project Director responsibility for the management of grants, contracts and cooperative agreements.

### The Faculty Research Fund

The University Trustees have set aside two permanent funds, the Dr. Thomas U. Coe Fund, and the William H. Weppler Fund for Faculty Research, the income to be used each year by the faculty for carrying on any scholarly activity. From time to time, some additional funds are made available to the Faculty Research Funds Committee for the same purpose.

### Faculty Summer Research Grants

This is a program of support to provide a limited number of grants to underwrite faculty research projects during the summer. Recipients are selected on the basis of information supplied in a proposal which explains the re-

search project to be conducted during the period for which the grant is made. The Research Fund Committee serves as a screening committee to evaluate the proposals.

### The Scientific Equipment and Book Fund Award

Once a year these funds are awarded to faculty members for the purchase of scientific equipment or books which will be used to stimulate or support a research project. Funds are allocated to faculty members of demonstrated research ability rather than to outfit a new faculty member with basic research equipment. The Faculty Research Funds Committee serves as a screening committee to evaluate the proposals.

### The Environmental Studies Center

This office provides leadership and focus to the University's research and public service activities dealing with land and water resources. Specific objectives are to design, organize, and administer a problem-oriented program of research; to determine the need for research information and to deliver that information in a form compatible with user needs, and to foster the training of students in land and water resources by involving them in the Center's activities. No courses or programs of study are offered; occasionally, topical seminars are held. Funded projects often are interdisciplinary and involve faculty and students from more than one academic department. Because it draws upon the research talents of faculty throughout the University, the Center's program is flexible and can be adjusted to meet changing needs.

### The University of Maine Center for Marine Studies

Approved by the Board of Trustees, September 28, 1977, and located on the Orono campus, the primary goal of this unit is to develop an internationally recognized center of excellence, emphasizing research and graduate studies. The center provides leadership in the development of quality research programs with emphasis on the Gulf of Maine, its related coastal zone, and other related cold water regions. The Center provides a focus for the development of planned programs. Units within the University which are components of the Center include the Joint Institutional Sea Grant Program, the Ira C. Darling Center at Walpole, Maine, the Maine Lobster Institute, the Migratory Fish Re-

search Institute, and the Maine Marine Advisory Program. The Center also provides access to marine research capabilities, including an 80-foot research vessel, that are located at other institutions in the region.

### The Ira C. Darling Center for Research, Teaching, and Service

The University's marine laboratory, a part of the Center for Marine Studies, is located six miles from the mouth of the Damariscotta River. Regional habitats range from marshes and tidal flats to rocky shores and subtidal rock walls. Deep-sea conditions can be reached 10-20 miles offshore. The center has 13,000 square feet of laboratory space and a wide variety of sampling and analytic equipment, including a scanning electron microscope, an elemental (CHN) analyzer, gas chromatographs, a scintillation counter, an image analysis system, and an atomic absorption spectrophotometer available for faculty and student marine research. Year-round dormitory space accommodates 12, and summer quarters are available for an additional 20. A steel and concrete pier provides berthing for vessels (one equipped with a hydraulic winch) and a number of outboard motor boats are used for inshore and nearshore field work. Through cooperative arrangements with other institutions, faculty and students have access to offshore and open ocean areas. The library contains several thousand volumes, more than 150 scientific journals, and an extensive reprint collection. Laboratory space for students and visiting investigators can be arranged.

### The Sea Grant College Program

This part of the Center for Marine Studies provides a focus for the University of Maine and other cooperating institutions on the important marine issues and the resource potential of the Gulf of Maine and its coastal boundary. Primarily a program of marine research, graduate education, and marine extension education, the Sea Grant College Program, in partnership with the University of New Hampshire, receives its primary funding through grants from the Office of Sea Grant, National Oceanic and Atmospheric Administration.

### Institute for Quaternary Studies

This is a global effort by faculty members with

joint appointments in the departments of Anthropology, Botany and Plant Pathology, History, and Geological Sciences, who have pooled their talents in studying the Quaternary Period. Their interdisciplinary projects relate the effects of glaciation to the physical, chemical, social, and economic conditions of the present and future.

### Center for the Study of the First Americans

The Center for the Study of the First Americans is an affiliate of the Institute for Quaternary Studies and is affiliated with the Department of Anthropology. It was created in 1981 to improve research, education, and information dissemination on Pleistocene prehistory of North and South America. The center recently has begun the "Peopling of the Americas" publication program which includes books and monographs, an annual journal called *Current Research in the Pleistocene* and a newspaper called the *Mammoth Trumpet*. Center professional staff conduct archaeological research at several North American sites, experimental research on stone and bone technology, and studies of Pleistocene human and non-human osteology and paleoecology.

### Laboratory for Surface Science and Technology

The Laboratory for Surface Science and Technology (LASST) is one of the University's major research units, and LASST coordinates research in a range of fundamental and applied areas relating to the properties of surfaces and interfaces of materials. Extensive laboratory facilities have been set up to support the research needs of LASST's faculty members, other University of Maine faculty, and state and regional industries. Although LASST is primarily a research organization, its research projects provide opportunities for both graduate and undergraduate students to acquire training and experience in a high technology program. Major research areas include surface crystallography, microwave acoustics, surface phase transitions, adsorption and catalysis, analytical methods, and adhesion.

### Migratory Fish Research Institute

Formed by faculty members with research interests in migratory fishes, the Institute's goal

is to stimulate, coordinate, and conduct basic and applied research on migratory fishes. It also fosters efforts to improve educational offerings in the biology of fishes. The Institute supports an active seminar series and awards research and travel grants to graduate students and young faculty members on a competitive basis. The Migratory Fish Research Institute is an interdisciplinary program, involving principally people from the departments of Entomology, Geology, Economics, Anthropology, Political Science, Botany, and Zoology. It is a component of the Center for Marine Studies.

### International Research and Educational Programs

The Office of International Research and Educational Programs was organized to provide a vehicle to foster increased short-term and long-term international research and development work among the faculty and staff of the University and to increase the number of qualified international students at the undergraduate and graduate levels at the University of Maine.

### The Department of Industrial Cooperation

This office coordinates specific task contracts between the University of Maine and outside agencies: government, corporations, and individuals.

### The Cooperative Extension Service

The University of Maine Cooperative Extension Service extends the resources of the University to the people of Maine wherever they live, an important responsibility of all land-grant colleges and universities. At work in Orono and in 16 county offices, more than 100 Extension faculty members and roughly 15,000 volunteers conduct educational programs to help Maine citizens solve problems at home, at work, on farms, and in communities. In addition, Extension administers the state's 4-H program, which involve more than 16,000 Maine young people in educational club, camp, and in-school activities. All Extension programs are based on research performed at the University of Maine and other land-grant institutions across the nation. Besides agents and volunteers, Extension personnel include state and area specialists, administrators, professionals, and paraprofessionals. County Extension As-

sociations sponsor Extension programs in each county. Maine's Cooperative Extension Service is part of a nationwide Extension system, supported by a three-way partnership involving the U.S. Department of Agriculture, the land-grant colleges and universities, and county governments.

### Center for Innovation and Entrepreneurship

The program identifies and responds to the commercialization needs of inventors and entrepreneurs and the technical needs of Maine business and industry by utilizing the resources available at the University of Maine.

### The Bureau of Labor Education

Established in 1966, the University of Maine's Bureau of Labor Education provides specialized educational opportunities and conducts practical research for Maine workers and their organizations. Program offerings and activities focus on leadership development, labor law, occupational health and safety, economics, and union administration. Through these activities, Maine workers are provided with information and knowledge necessary for making informed decisions regarding changing economic, political, and social conditions.

### The Pulp and Paper Foundation

Supported by private funding from 135 companies located in 25 states and several hundred individual donations, the foundation encourages a strong teaching and research program in chemical engineering, with a significant scholarship program available to qualified students.

### Office of International Natural Resources and Agriculture Programs and Title XII Officer

The Office focuses on natural resources conservation and agriculture primarily in developing countries stressing conservation of biological diversity, training, public awareness and education, research and inventories, and resource management. The program also assists faculty and students who seek involvement in international conservation and agricultural activities.

## Katahdin Area Health Education Center

The unit provides Continuing Education Division programs to health professionals; assists medical and nursing students at various universities to participate in clinical rotations with rural physicians and hospitals; develops educational programs for rural areas, and recruits minority students into the program.

## The Maine Lobster Institute

A cooperative program of research and education with the lobster industry, the Institute generates information about the Maine lobster which is used to help conserve and enhance the resource and ensure the continuance of this strong and healthy industry in Maine and adjacent areas. The Institute works with representatives of the industry to identify practical problems and generate their solutions.

## Maine Marine Advisory Program

The unit is a network of organizations working together toward a common goal: to promote the wise use, development, and conservation of northern New England's coastal and marine resources through research-based educational programs. By integrating the talents and resources of a variety of educational institutions and government agencies, it extends the impact of its programs and responds effectively to the needs of those dependent on marine resources.

## Franco-American Centre

The Centre serves as an advocate for Franco-Americans and provides a vehicle to stimulate the development of academic and nonacademic program offerings relevant to their history and life experience.

## Maine Council on Economic Education

A cooperative effort of the University of Maine and more than 100 business and labor groups combined with the University's College of Education, the Council serves to offer statewide programs of teacher training in economics; host workshops, and integrate economics education into school curricula.

## National Center for Geographic Information and Analysis

The world's first such center, the NCGIA serves as a computerized clearinghouse for geographic information which includes population distributions, ocean currents, endangered species, the distribution of pollutants, infectious diseases, and transportation and communication networks. The Center is run by a consortium consisting of the University of Maine, the University of California at Santa Barbara, and the State University of New York at Buffalo.

## Division of Student Affairs

### Center for Student Services

The staff works closely with individual students and student groups helping them solve problems relative to their personal, social, and academic concerns. They act as a resource to Student Government and other student organizations, assist students in the development and evaluation of student life policies, and serve in an advocacy capacity by working with students to speed up the administrative problem-solving process. The office also addresses specific student needs through the following sub units:

- Commuter/Non-Traditional Student Services
- Indian Programs and Minority Services
- International Student Program
- Judicial Affairs Office
- Memorial Union Program
- Student Activities and Organizations
- Substance Abuse Services

### Counseling Center

The Counseling Center's mission is to provide services and programs which promote the personal development and psychological well-being of students, and to encourage a University atmosphere which is conducive to growth and which maximizes students' educational attainments.

In order to carry out this mission, the Counseling Center is staffed by experienced, doctoral level counselors, psychologists and a psychiatric consultant. The staff provides a full range of counseling and mental health services to help students who are experiencing difficul-

ties in areas such as educational functioning and decision making, career selection, personal and emotional development, relationship difficulties, psychological disorders and emotional crises. These services are provided through individual and group counseling/therapy; educational/occupational library resources; interest, ability and personality testing; psychological and psychiatric evaluation and preventative and developmental programming. In addition to these services, Counseling Center staff also provide consultation and educational programming to the campus community.

All full-time students, freshmen through graduate, on the Orono campus are eligible for the services of the center free of charge. Referral services are provided to persons who are not eligible for service.

Counseling Center offices are located at 101 Fernald Hall and the Cutler Health Center. Students can make appointments at either location.

## Career Center

This office provides counseling and assistance to students who are involved in career planning and/or seeking employment. The program is designed to serve all students including undergraduate and graduate divisions as well as alumni.

Staff members provide individual counseling to help students explore career options, set career goals, and devise strategies for reaching these goals. SIGI PLUS, a computer guidance system, is also used to assist students with career decisions. Counselors are actively involved in outreach programming in residence halls, classes and organizations on campus. A Self-Help Career Lab is located within the office which contains extensive written and audio-visual materials on careers, employers, and graduate schools.

Special programs are sponsored by this office on an on-going basis. These programs are designed to help students make connections with employers, either for career information or for placement assistance. Examples of such programs include Career Day, the Maine Mentor Program, the Graduate School Fair, and the Maine Recruiting Consortium.

Employers from a variety of local and national firms conduct interviews on campus for graduating seniors. A number of organizations also interview underclass students on campus for summer positions and internships.

In addition, the office collects and publishes information regarding job openings for graduates. A job match and referral service is provided for students seeking part-time and summer jobs. Students are also encouraged to develop their own personalized job search and assistance is provided through individual counseling and group workshops such as "Discovering and Marketing your Skills," "Resume Writing" and "Interviewing Techniques."

## Office of Student Aid

The Office of Student Aid administers a variety of programs to help students finance their education when their own families' resources are inadequate. To enable the University to make a proper judgment as to the amount and kind of assistance a student needs, the Financial Aid Form (FAF) should be filed with the College Scholarship Service. The FAF is available at high schools, and the UM Office of Student Aid. Applications must be filed each year, whether or not the student has filed previously. Priority funding will be given to applications filed by March 1. Applications received after this date will be considered only after on-time applicants are processed and if funds are available.

*Note:* All aid applicants are considered without regard to age, sex, race, ethnic origin or physical ability except in those cases where the aid is intended to rectify prior or existing imbalance in minority or other group participation in the educational process.

Some of the financial aid programs are listed below:

*Supplementary Educational Opportunity Grants.* These grants are made available from federal funds to students who meet certain need standards. This source of aid is not repaid.

*Perkins Loans (formerly NDSL).* Amounts awarded are based on student need. No interest is charged on loans until repayment begins. Ordinarily a repayment period of 10 years is permitted at an interest charge of five percent of the unpaid balance beginning 9 months after graduation, 6 months for students who borrowed previous to July 1, 1987. Grace periods of three years on payment of principal or interest are allowed for military service, Peace Corps service and VISTA service. Also, no payments are required as long as the student remains at least a half-time student in a degree program at either the graduate or undergraduate level. Cancellation of the loan

amount, plus interest, is granted for those who become full-time teachers in elementary or secondary education in "deprived" areas and to teachers of the handicapped. Allowances are also made for teachers in Head Start programs and special circumstances for people in military service. Loans are awarded on the academic-year basis only and must be reapplied for each year. They are not automatically renewed.

*College Work-Study Program* (summer and academic year). With the assistance of federal funds, the University is able to provide many employment opportunities either on the campus or in various non-profit off-campus agencies. Location of employment is usually limited to within the State of Maine. Many jobs provide work experience directly related to the student's educational objective, also providing regular income for educational expenses. Students generally are limited to part-time work during the summer or other school vacations. Eligibility is based on financial need.

*Pell Grant Program*. Federal grants applied for directly to the U.S. Department of Education are available to students during their undergraduate years. The Financial Aid Form used for University application is also used for the Pell Grant. This type of aid is not repaid. All Pell Grant recipients are required to certify compliance with the Anti-Drug Abuse Act.

*University Scholarship*. This is gift aid, based primarily on need, but academic achievement or special donor requirements may be additional criteria. Scholarships awarded through the Office of Student Aid are primarily for undergraduates. Aid to graduate students is available through the Graduate School.

*University Grants*. This is gift aid offered through state appropriations to the University. This grant is awarded on the basis of financial need and does not require repayment.

*Regular Student Employment*. Information for on-campus employment opportunity is available at the Office of Student Aid and through individual UM departments.

*Guaranteed Student Loan Program*. Student bank loans for educational purposes are available with repayment after graduation. Contact your family bank, credit union or other lending institution for information.

### **Satisfactory Academic Progress for Federal Student Aid Recipients**

All student aid recipients must meet the University's policy of Satisfactory Academic

Progress to receive federal aid. Student's progress is measured by their grade point average (GPA) and the number of credits completed. Students also have a maximum time-frame in which to complete their academic program. The time-frame varies depending on the program of study. A student must meet both the minimum GPA requirement and have completed the required credit hours within established times to retain eligibility for federal financial aid. A brochure, *Academic Requirements for Students Receiving Federal Student Assistance*, outlines the policy in detail. The brochure is available from the Office of Student Aid.

### **International Student Program**

The University maintains an office to provide information and assistance to students who are not citizens of the United States. The International Student Program Office assists students in understanding the administrative regulations of the institution; local, state and national laws; and accepted standards of conduct expectations and reactions encountered by those in a new cultural environment.

This office is responsible for issuance of the U.S. Immigration I-20 or IAP-66 forms necessary for the international students to obtain student visas from the American consulate in their native country. All international students, including those with "F" student or "J" exchange student status, must report to the International Student Program Office as soon as convenient after arrival on campus. Advice concerning immigration regulations, necessary forms, etc. is available so that international students may remain in the United States as long as necessary to achieve their educational goals. Additionally, opportunities to assist American students in obtaining passports, student ID cards, and meeting and working with International students are offered through this office.

### **Office of Indian Programs and Minority Services**

The Office of Indian Programs and Minority Services was created by the University of Maine to facilitate the cultural and academic adjustment of its minority student body.

This office assists in recruitment and retention of minority students. It also works with other campus resources to provide support services such as academic advising, career

counseling, and financial aid assistance to minority students. In addition, programs are offered throughout the year that highlight the cultural diversity of the student population at the University of Maine.

## Student Health Service

The Student Health Service provides comprehensive health care to all University of Maine students. Outpatient services—including appointments with physicians and nurses, consultation with some medical specialists, laboratory studies, x-rays, physical therapy, and pharmacy—are all available at the Cutler Health Center on the Orono campus. Health education is an integral part of the Student Health Service and programs are provided at the Health Center as well as in dorms and fraternities on the Bangor and Orono campuses.

Most outpatient services provided at the Cutler Health Center are covered by the Comprehensive Fee. There is a reasonable charge for medications obtained at the pharmacy and for laboratory tests sent to referral (off-campus) laboratories. Part-time students who do not select the health service as one of the Comprehensive Fee options may use the Health Center on a fee-for-service basis. There is a charge for all students for hospitalization. This is not a Comprehensive Fee benefit. Students are also responsible for the cost of care provided off-campus.

For University employees, the Student Health Service provides only emergency first-aid and assistance with emergency medical referral.

## Religious Affairs

Eleven religious groups provide opportunities for religious programming, worship, study, conversation, and witness: Hillel Foundation for Jewish students, Maine Christian Association for Protestant students, St. George's Greek Orthodox Church for Greek Orthodox students, Our Lady of Wisdom Parish/Newman Center for Roman Catholic students, U.M. Student Fellowship (Pentecostal), United Methodist Church (Methodist), Redeemer Lutheran Church (Lutheran), Orono Friends (Quaker), and the Canterbury Club (Episcopal). The chaplains are available for counseling or instruction. The Intervarsity Christian Fellowship and Navigators, two approved student

organizations, meet weekly in the Memorial Union.

Questions concerning the above may be directed to the Office of the Dean of Student Activities, the Memorial Union.

The churches and synagogues of Orono, Old Town, and Bangor always welcome the attendance of University students. The Drummond Chapel, a small meditation room open to the University community, is located in the Memorial Union.

The Office of the Dean of Student Activities, Memorial Union, serves as a resource in the areas of religious affairs.

## National Student Exchange

The National Student Exchange (NSE) program offers students an opportunity to study in over 80 universities throughout the United States and its territories for a semester or academic year. The program provides an opportunity for students to experience a different academic environment while maintaining progress towards academic goals, expanding academic options, clarifying personal and professional goals, and seeing and experiencing the United States with its diversity of cultures,

Students who feel a need to grow personally, academically, culturally, and socially; who are adaptable to short-term exchange; and whose goals are consistent with the purposes of the NSE program are encouraged to explore this option. Applicants must be full-time students, at least sophomores, and maintain a minimum 2.5 GPA. For information and applications contact the NSE Coordinator, Center for Student Services, Memorial Union.

## Student Life

### Student Government

The University of Maine Student Government is the largest of its kind in the State of Maine. It is funded and controlled by students with the sole purpose of benefiting students through educational, cultural and social programs, events, and activities.

The Student Government is involved in literally hundreds of University policies and programs, from sponsoring food baskets for the hungry at Thanksgiving to working out rea-

sonable alcohol policy with various University officials.

The activities of student government are directed by an elected president and vice-president who appoint and coordinate a diverse administrative staff. There are six governing boards, many committees, and other divisions representing the needs of students and promoting student rights.

The Student Government receives monies from the Student Activity Fee. The Student Government Executive Budgetary Committee, as an advisory body, assists in budget matters and in disbursing funds to groups and interests requesting assistance.

The General Student Senate is the legislative unit of the Student Government and is under the leadership of the vice-president.

The six boards that help make up the Student Government are the Guest Lecture Series, the Off-Campus Board, the Residents on Campus, the Fraternity Board, the Student Legal Services Board, and the Panhellenic Council. All Board chairpersons hold seats in the Cabinet of the Student Government which is chaired by the President of Student Government. All Student Government committees and meetings are open to all students, as well as memberships to those committees.

#### **General Student Senate (GSS)**

The GSS has final approval over all Student Government matters. It is composed of 35 to 55 members, each elected by a specific constituency for a one-year term. The GSS deals with budget matters, Student Government Policy, recommendations to the University, and any matters affecting the students of UM.

#### **Guest Lecture Series (GLS)**

The Guest Lecture Series is a board of student government whose mandate is to promote a well rounded education by presenting lectures on diverse topics and subjects to the University community. GLS sponsors six to eight lectures each year and is also responsible for assisting various campus organizations and departments in bringing speakers of special interest through co-funding and other support.

#### **Residents on Campus (ROC)**

As the student governing body of the 22 residence halls and the three area Boards at U.M., the ROC's purpose is to coordinate and assist in the implementation of programs, policies and activities directly involving on-campus students.

#### **Off-Campus Board**

The Off-Campus Board was created to serve

the needs and interests of the undergraduate student housed off-campus. This is accomplished by providing functions such as frequent meetings, spaghetti dinners, concerts, a food co-op, a monthly newspaper, and other social events.

#### **Fraternities/Sororities**

The University of Maine Fraternity Board/Panhellenic Council are funded through Student Government and provide services for students and the community; marathons, blood banks and big brother/big sister programs all raise dollars and awareness for needed charities. Greek Week, a strong competitive intramural schedule and many social events highlight Greek life on campus.

#### **Association of Graduate Students**

Graduate Students have their own student government which is described in the Graduate School Catalog.

#### **Student Legal Services**

The Student Government funds this program which provides free legal advice to students on such issues as landlord-tenant relationships, divorce, small claims, personal injury, auto accidents, problems with the University, and many others. Full court representation is also available. The office is staffed by one attorney, two full-time paralegals and student paralegals.

Any University student who has paid an activity fee to the Student Government at the University of Maine shall be entitled to utilize the facilities of the Student Legal Services.

#### **Residency Requirement for First Year Students**

The University of Maine believes that living in campus residence halls is an educational opportunity that all first year students should experience. Campus residence halls provide students the opportunity to become part of a community and participate in a variety of educational experiences. To facilitate this experience, living in a residence hall is a requirement for all first year students who are under the age of 20, who do not live in the immediate area and who do not have exceptional circumstances which would prevent them from living on campus. For additional information on this policy, please contact the Department of Residential Life at (207) 581-4584.

#### **Public Affairs**

Public Affairs serves as the University of



Maine's official link with the media and is responsible for UM's major publications (including graphic arts and editing), photography and broadcast-related needs. The staff disseminates news releases, story leads, photos and print and broadcast material to the local, state, and national media, and responds to requests for information from newspapers, magazines, radio and television stations, and the general public. In addition the staff is involved in organizing press conferences, and generating and assisting in publicity for University of Maine events and activities. Public Affairs is responsible for UM's general information materials, directories, catalogs, bulletins, weekly calendar, and other publications. Public Affairs also assists UM departments and offices in their individual media counseling, publications, broadcasting (radio and television), photographic, graphic arts/design and editing needs. The Speakers Bureau, experts referral service and campus tours are also administered through Public Affairs.

### Office of Equal Opportunity

The Office of Equal Opportunity is responsible to assure the University's compliance with relevant federal and state equal opportunity laws and regulations as well as with University of Maine System nondiscrimination policies. This responsibility involves planning, policy development and advisement.

### Maine Center for the Arts

The Maine Center for the Arts, the cultural focus of the University of Maine and the surrounding region, was dedicated in September of 1986. The Center consists of the 1,629-seat Hutchins Concert Hall, the Hudson Museum, the Palmer Gallery, and the Bodwell Dining Area.

The Center presents a wide assortment of more than forty live performances during the academic year from September to May, as well as a summer series consisting of twelve to fifteen events. A full spectrum of performances is offered, ranging from classical music to bluegrass, from avant-garde dance to Broadway musicals, jazz to folk and ethnic music, comedy to family entertainment, and much more. In addition to the regular season of events, the Concert Hall is also available for rent by major promoters who have brought still other types of performers to the University of Maine Campus.

Past performances have featured Isaac Stern and Yo Yo Ma, Arlo Guthrie, Jean Redpath, the Royal Winnipeg Ballet, the Peking Acrobats, Marcel Marceau, Leontyne Price, Rudolf Nureyev, Johnny Winter, Greg Allman, the Modern Jazz Quartet, Peter, Paul and Mary, Dana Carvey, Dennis Miller, Kris Kristofferson, Lee Greenwood, and many others.

Students are encouraged to experience a wide variety of performances to enhance their overall education at the University of Maine. The Comprehensive Fee makes it possible for UM students to attend some performances at no cost, and substantial discounts are also often offered to UM students.

In addition, students can benefit from Master Classes which are often offered in conjunction with performances by visiting world-class artists in many disciplines.

Tickets for all events are available at the Box Office, located in the lobby of the Maine Center for the Arts. The Box Office is open weekdays from 10:00 a.m. to 3:00 p.m. and one and one-half hours before every performance. The phone number for ticket orders is (207) 581-1755.

### Computing and Data Processing Services

Located in the Computing Center, this group provides support for instructional, research, consulting and administrative needs of the University community. The Computer Science and other departments provide relevant academic offerings. The staff of the Computing Center develops and maintains programming systems and applied programs, conducts short courses and workshops, and provides programming assistance.

University facilities include an IBM 3090 processor with 64 million bytes of main storage. The current configuration includes more than 1500 telecommunications ports and more than 10 billion bytes of disk storage. Five tape drives are available: densities of 6250/1600/800 bpi all are supported. The base operating system is VM/370. CMS provides interactive and batch facilities while DOS/VSE with CICS provides transaction processing as well as batch capabilities. A number of minicomputers including a VAX 11/780 also are connected to the system. Through BITNET, Maine systems connect to educational institutions throughout the world.



# Academic Information

## Questions on Policy

Policies set forth in this publication provide specific guidance for students at the University of Maine. It is the responsibility of each student to be familiar with these policies which govern their courses of study. Questions concerning material in the catalog should be directed to the student's academic advisor or to the dean of the appropriate college.

## Responsibilities

It is the responsibility of the student to fulfill all academic requirements required to achieve his or her selected educational objective. It is the responsibility of the faculty and staff to advise and assist the student in this effort.

## Immunization Law

The State of Maine requires all students born after 1956 to furnish proof of immunization against measles, rubella, tetanus, and diphtheria. Proof of immunization must be on file at Cutler Health Center prior to finalization of registration. Students should forward proof of immunization to Cutler Health Center as soon as possible after notification of admission.

## Registration

Undergraduates at the University of Maine will register in accordance with the following procedures:

### First-Year Students

All first-year students are required to attend both orientation sessions held during the summer and in the fall immediately prior to the start of classes. The dates of these sessions are furnished to new students and their parents.

Registration for the fall semester occurs during the summer orientation period in consultation with representatives from the faculty.

### Upperclass students

Upperclass students who transfer to the University of Maine will contact the dean of their college after admission to register for the upcoming semester.

All currently active students who plan to return to UM will meet with their advisor.

Academic advisors are assigned to all students to assist in planning their educational programs to ensure they're meeting graduation requirements, to provide counsel and guidance in academic work, and to advise with study or classwork problems. Each student is, however, ultimately responsible for satisfying degree requirements.

## Course Numbering System

Courses numbered 0-99: Associate degree, vocational courses or other courses not normally transferable toward a baccalaureate degree.

Courses numbered 100-299: Associate and/or lower level baccalaureate degree.

Courses numbered 300-499: Upper level baccalaureate courses; with appropriate qualification and permission, may be taken for graduate credit.

Courses numbered 500-599: Graduate level courses; with appropriate qualification and permission, may be taken for undergraduate credit.

Courses numbered 600-699: Graduate level courses.

## Grading System

Letter grades on a scale of A to E are given by faculty at the University. Faculty may grant plus and minus grades. For purposes of comparison, these letter grades carry the following numerical values:

A = 4.00; A- = 3.67

B+ = 3.33; B = 3.00; B- = 2.67

C+ = 2.33; C = 2.00; C- = 1.67

D+ = 1.33; D = 1.00; D- = 0.67

Passing undergraduate grades: A, Excellent; B, Good; C, Satisfactory; D, Low-level passing, below the average required for graduation; P, Passed for degree credit, only on a Pass/Fail basis.

Failing grades: E, Failed. F, Failed a pass/fail course (Does not count in grade point average.) L, Stopped attending, (calculates as "E" on transcript.)

Progress grade: R, final grade deferred (primarily for thesis).

Non-credit grades: W, dropped without penalty.

Incomplete grades: A grade of incomplete must be made up at the discretion of the instructor, however, this action must be taken no later than one calendar year from the end of the semester in which the student was registered for the work. At that time an incomplete grade will automatically change to an "E". Any incomplete grades remaining on a student's record at the time of graduation will automatically change to an "E".

The degree hours are the sum of the course credit hours of those courses which may be counted toward a degree, provided a passing grade has been received.

The accumulative average is the quality point divided by the total attempted hours, carried to two decimal points. The quality points are the number of credit hours taken multiplied by the numerical value of the letter grade. The total hours are the sum of the course credit hours from all courses attempted except those taken on a Pass-Fail basis. Pass-Fail registrations do not affect the grade point average.

Grade reports are sent in the student's name to an address designated by the student. (Campus addresses are not normally considered valid grading addresses.) A student's academic performance is considered confidential information and written permission of the student is normally required to fulfill inquiries by persons outside the administrative or academic community of the University of Maine.

Considerable care is taken to ensure that all grades entered on a student's permanent record are accurate. Any student who, upon receipt of a semester final grade report, suspects an error, should contact his or her instructor without delay. Records are considered to be correct if a student does not report errors to the Registrar's Office within six months of the completion of a course.

## Academic Requirements

Students are advised that they must meet the specific academic requirements as shown in the University catalog in effect at the time of their initial matriculation. In the event that a student is absent from the University for two or more years during a program of instruction, the academic requirements shown in the catalog in effect at the time of re-matriculation will normally apply.

## Academic Probation, Suspension, Dismissal

The Committee on Academic Standing meets to determine which students are not making satisfactory progress. Those students not meeting academic requirements are placed on probation, or suspended, or dismissed.

### Academic Probation

Academic Probation signifies unsatisfactory performance that does not warrant suspension or dismissal but does indicate that the student's academic future is in question.

Academic probation is determined generally by the following scale:

Total Hours	Minimum Accumulative Average*
0-30	1.7
31-60	1.8
61-90	1.9
91 and above	2.0

### Remedial Probation

Associate degree students may be placed on Remedial Probation. While in this status, they must pursue a directed program of remedial courses. No degree credit will be granted for this work.

### Academic Suspension

Academic Suspension indicates that a student

\*Most associate degree programs require 1.8, 1.9 and 2.0 at the end of the first, second, and third semesters respectively. In individual situations, the dean of a college may place a student on probation for unsatisfactory performance even though his/her accumulative average exceeds the above listed minimums.

is separated from the University for one semester with return guaranteed upon application for readmission.

Suspension is the usual academic action when a student's performance in a single semester is poor (usually under 1.0) or when required courses have been failed with an otherwise satisfactory record.

## Academic Dismissal

Academic Dismissal indicates that a student is separated from the University for a minimum of one semester. Return is not guaranteed; a student must file an application for readmission. Students dismissed twice from the University are not ordinarily allowed to return.

Dismissal is the usual action when a student fails to make normal progress toward graduation. Situations that lead to academic dismissal are:

1. Failure to maintain an accumulative grade-point average at a level necessary to make acceptable progress towards the accumulative grade-point average required by the college for graduation.
2. First-year students who receive a GPA below 1.0;
3. Students on probation who fail to improve in the subsequent semester, or
4. Upperclass students readmitted following suspension or dismissal and who show no improvement.

## Provisional Dismissal

First-year students and first semester Transfer Students who are experiencing academic difficulties may be placed in a Provisional Dismissal Status. This status requires the student to discuss his or her academic record with the Dean of the College to determine whether the student will continue in classes during the following semester.

## Forgiveness Policy

Associate Deans may re-evaluate the first semester transcript of students placed on Provisional Dismissal even though the student is allowed to continue without a break in enrollment. Normally such re-evaluation will be done at the end of the second semester, and will

be reserved for students whose GPA for that semester is 2.0 or above.

## During Suspension or Dismissal

Students under dismissal or suspension may not register for a course or courses in any division of the University for credit. They may, with the approval of the dean of the college from which they have been dismissed or suspended and the Vice President for Academic Affairs, take a course or courses on a non-credit basis for remedial purposes. Students under dismissal or suspension who register for a course or courses at other institutions should be aware that credit so obtained will not ordinarily be accepted by the University of Maine if and when the student is readmitted.

## Appeal Policy

If a student wishes to appeal a decision of the Committee on Academic Standing, he or she may appeal to a Subcommittee comprised of the dean of the student's college (or designated representative) and the Vice President for Academic Affairs (or designated representative). If the decision of these two individuals is unsatisfactory to the student, he/she may make a final appeal to the Committee on Academic Standing as a whole. The decision of the Committee as a whole will be final.

## Graduation

Each college sets its own graduation requirements in terms of grades or grade points. Candidates for associate and baccalaureate degrees must: (a) receive passing grades in all courses required by the major department, (b) accumulate the number of degree hours specified by the college in which the student is registered, and (c) achieve an accumulative average of not less than 2.0.

To be considered for graduation, a student must complete an Application for Degree or Certificate form during the final semester. These forms are available in the Registrar's Office. If application is made, but no degree is conferred, another application must be submitted prior to the next commencement. A minimum residence of one year is required for the attainment of any bachelor's degree. This reg-

ulation refers to the senior year. Two exceptions to this regulation were approved by the Trustees in 1978: 1. Exceptions may be made for students who have already completed three or more years at the University of Maine who may be given permission by their academic dean, when there is sufficient and valid reason, to complete the senior year elsewhere under the general supervision of their dean's office. 2. Students who have completed a minimum of three years of work at the University of Maine and who have been admitted to an accredited professional school of medicine, dentistry, veterinary medicine, or divinity may qualify for the appropriate bachelor's degree at the University of Maine upon receipt of the professional degree, provided that their collegiate dean at the University of Maine approves. This policy is retroactive. Inquiries about degrees awarded under this exception should be addressed to the Registrar.

Baccalaureate Degrees with distinction are conferred at commencement for the following attainments in rank: Seniors having an average grade of 3.50 or above will be graduated with Highest Distinction, 3.25 to 3.49 with High Distinction and 3.00 to 3.24 with Distinction if they meet the criteria listed below.

These criteria state that the average grade is based on the students work on the Orono campus and must include 60 hours or 50% of the

total degree hours required in the student's program of study, whichever is greater. A minimum of at least 15 credit hours by the senior year must be taken at the University of Maine for the attainment of any associate degree.

Degrees with Honors, with High Honors, or with Highest Honors are awarded to seniors who successfully complete the Honors Program.

From the graduating seniors in December and May, the two highest ranking baccalaureate degree candidates are designated class valedictorian (highest) and salutatorian (next highest). For May graduates, this rank is based upon the first seven semesters of full-time attendance, all of which must have been in resident instruction at the University of Maine.

Students who have declared a double major or a double major across-college lines must satisfy the requirements for each major prior to the award of the appropriate degree.

Students who have taken sufficient courses outside of their primary major to qualify for a second degree must have at least 150 degree hours prior to the award of the second degree if they are in one of the colleges that require 120 hours for graduation. Students in colleges which require more than 120 hours for graduation must have 30 hours beyond their normal degree requirements to be awarded a double degree.



# Financial Information

## General Information

The University expects the student to be financially responsible. All accounts are carried in the name of the student. Bills and statements are mailed to the student, not the parent. All charges are payable in full no later than the first day of class for each semester. After that, a \$25.00 late fee is assessed. After the fourth week of classes students with accounts that have not been paid or deferred to financial aid will have their class registrations for the semester cancelled. Financially delinquent students will not be allowed to register for courses and academic records will be withheld until all financial obligations to the University have been satisfied.

The financial requirements of the University, changing costs, state and legislative action and other matters may require an adjustment of these charges and expenses. The University reserves the right to make such adjustments to the estimated charges and expenses as may from time to time be necessary in the opinion of the Board of Trustees up to the date of final registration for a given academic term. The applicant acknowledges this reservation and agrees to the financial terms and conditions of the University by the submission of an application or by registration.

## Invoices and Statements

Semester bills are mailed to the student's home address approximately 45 days before the start of a semester. Charges are calculated using pre-registrations, room sign-up information, and data supplied by the Admissions Office.

## Schedule of Charges

### Application Fee

A nonrefundable application fee of \$15.00 must accompany each application.

### Matriculation Fee

A one-time fee of \$15.00 is required of each student who elects to pursue a degree program.

## New Student Fee

All new students (freshmen and transfers) are charged a one-time New Student Fee of \$45.00. Students who reside in a residence hall during the New Student Orientation program are billed accordingly for those services.

## Tuition

### Undergraduate and Associate Maine

**Residents \$56.00 per credit hour.**

**Non-Residents \$158.00 per credit hour.**

Non-Resident students enrolled under the New England Board of Higher Education Exchange Program are billed at 25 percent above the Maine Resident rate.

## Room and Board

Regular Residence Halls	Semester	Year
21-meal plan	\$1695.00	\$3390.00
14-meal plan	\$1665.00	\$3330.00

### Colvin Hall

Coop-Housing	Semester	Year
21-meal plan	\$1425.00	\$2850.00

York Village (Room Only)	Semester	Year
	\$ 842.50	\$1685.00

Commuter, York Village and Chadbourne Hall Meal Plans	Semester
5 meal plan (any 5 meals 7 days a week)	\$ 330.50
10 meal plan (any 10 meals 7 days a week)	\$ 642.50
14 meal plan (any 14 meals 7 days a week)	\$ 822.50
21 meal plan (any 21 meals 7 days a week)	\$ 852.50

## Mandatory Fees

A mandatory student activity fee of \$17.50 per semester, a communication fee of \$6.00 per semester and a recreation fee of \$7.50 per semester are charged to all students enrolled for six or more credit hours.

A mandatory comprehensive fee of \$100.00 per semester is charged to all students enrolled for 12 (twelve) or more credit hours. Students enrolled for at least 6 credit hours but less than 12 credit hours will be assessed a comprehensive fee at the rate of \$8.33 per credit hour. Stu-

dents enrolled for less than 6 credit hours will not be assessed the comprehensive fee.

### Yearbook (Optional)

Students electing to purchase a yearbook will be billed for the yearbook on the Fall semester invoice.

### Insurance Fee

A student health insurance plan is an excellent way for students to safeguard against medical expenses. All enrolled students are eligible to participate. The charge for this insurance coverage is \$298.00 per year.

### Student Health Fee

The student health fee provides outpatient services at the Cutler Health Center including physician, nurse and physical therapy visits as well as on-premises lab testing and X-rays. Students who are enrolled for 12 (twelve) or more credit hours receive this coverage as part of their comprehensive fee.

Students enrolled for 6 through 11 credit hours have the option of selecting the health care coverage, at no additional cost, as part of their comprehensive fee.

Students enrolled for 1 through 5 credit hours may, for a \$50.00 part-time fee, voluntarily subscribe to the health care program.

### Late Fee

A \$25.00 late fee will be assessed to students who register for class and/or pay their bills after the first day of class. To avoid being charged the late fee students who have not received a bill should contact the Business Office before the start of classes for an estimation of charges.

### Books and Supplies

The cost of books and supplies depends on the courses in which a student is enrolled. Books and supplies are not billed on the semester invoice. They must be paid to the University Bookstore at the time of purchase. Average semester expenses total \$200.00.

### Course Fees

Course fees are charged in several courses. The amounts are listed in the Schedule of Classes.

The invoices for course fees are mailed to the student approximately four (4) weeks after the beginning of each semester. Course fees for courses dropped after the second week of classes are not retracted.

### Applied Music Fees

The fees for students registered in applied courses in music are indicated in the Music section of the catalog. These are billed after the beginning of the semester.

### Acceptance Deposits

Students accepted to the University of Maine for the fall semester will be requested to submit a \$150.00 non-refundable acceptance deposit by the Candidates Reply Date of May 1. Deposits received prior to May 1 are considered non-refundable deposits. Students accepted after May 1 will be requested to submit the non-refundable confirmation deposit within two weeks of notification. The acceptance deposit is credited to the student's account in the University Business Office.

Students accepted to the University of Maine for the spring semester will be requested to submit a \$150.00 non-refundable deposit by January 1. Deposits received prior to January 1 are considered non-refundable.

### Withdrawal From The University

Students who are considering withdrawal from the University should report to the Center for Student Services, Memorial Union for information about the correct procedure. Returning students electing to live in residence halls for the next academic year must sign up and pay a \$75.00 room deposit during the latter part of the Spring Semester. The deposit is credited to the Fall Semester bill. If the room reservation is cancelled on or before June 1, the deposit is refundable. The room deposit is forfeited if the cancellation is received later than June 1.

### Refunds

Students leaving the University before the end of a semester may be eligible for a refund.

#### A. Tuition

Tuition will be refunded according to the scale and provisions set forth below for students withdrawing during the first four (4) weeks of a term.

1. Scale: The period of attendance is



counted for the first day of classes and includes weekends and holidays. The refund will be calculated as of the date the student notifies the Registrar of withdrawal.

1st week	100%
2nd week	75%
3rd week	50%
4th week	25%

No refund is made after the 4th week.

## 2. Provisions:

- (1) In no case will tuition be reduced or refunded because of voluntary absence from classes
- (2) Tuition adjustments attributable to involuntary absence, e.g., extended illness will be processed on a case by case basis.

## B. Fees

University fees are not refundable.

## C. Room and Board

Room and board refunds are made in accordance with the Residence and Dining annual contract. The annual contracts must be signed by each student living in a residence hall. No refund will be made for withdrawals occurring less than 14 days prior to the end of a semester.

## Add-Drop Refund Policy

Students will be given financial credit for courses which are dropped during the Add-Drop period only (the first two weeks of classes). No financial adjustments will be made to students' accounts for courses dropped after this period.

## Installment Plan

For parents and students who find it more convenient to make monthly payments, the University of Maine at Orono offers a monthly payment plan administered by Academic Management Services, 50 Vision Boulevard, East Providence, R. I. 02914. This plan enables the student or parents to pay all or a portion of their annual charges in equal installments. The fee for this option is \$45.00 per year. An application for the installment plan may be obtained from the Business Office, Alumni Hall.

## Rules Governing Residency

### Original Classification

A student is classified as a resident or a non-

resident for tuition purposes at the time of admission to the University. The decision, made by the Director of Admissions, is based upon information furnished by the student's application and any other relevant information. No student once having registered as an out-of-state student is eligible for resident classification in the University, or in any college thereof, unless he or she has been a bona fide domiciliary of the state for at least a year immediately prior to registration for the term for which resident status is claimed. This requirement does not prejudice the right of a student admitted on a non-resident basis to be placed thereafter on a resident basis provided he or she has acquired a bona fide domicile of a year's duration within the state.

### Change of Classification

For University purposes, a student does not acquire a domicile in Maine until he or she has been here for at least one year primarily as a permanent resident and not merely as a student. If the student is enrolled for a full academic program, as defined by the University, it will be presumed that the student is in Maine for educational purposes and the burden will be on the student to prove otherwise. In general, members of the Armed Forces and their dependents are normally granted in-state tuition rates during the period when they are on active duty within the State of Maine.

Subject to the provisions of the preceding paragraph, the domicile of an unmarried minor follows that of the parents or legally appointed guardian. The bona fide year round domicile of the father, if living, otherwise that of the mother, is the domicile of such a minor, but if the father and the mother have separate places of residence, the minor takes the domicile of the parent with whom he or she lives or to whom he or she has been assigned by court order. If neither of the parents are living, the unmarried minor takes the domicile of his or her legally appointed guardian.

Subject to the provisions of the first paragraph, an adult student, defined for the purposes of these rules is one who is either married or 18 years of age or older, will be classified as a resident of Maine if he or she has completed 12 consecutive months of domicile in Maine immediately preceding registration for the term for which residents status is claimed.

Subject to the provisions of the first paragraph, if a non-resident student has a spouse who has a residence in Maine, the student shall be deemed to have a residence in Maine.

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### Original Classification

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resident for tuition purposes at the time of admission to the University. The decision, made by the Director of Admissions, is based upon information furnished by the student's application and any other relevant information. No student once having registered as an out-of-state student is eligible for resident classification in the University, or in any college thereof, unless he or she has been a bona fide domiciliary of the state for at least a year immediately prior to registration for the term for which resident status is claimed. This requirement does not prejudice the right of a student admitted on a non-resident basis to be placed thereafter on a resident basis provided he or she has acquired a bona fide domicile of a year's duration within the state.

### Change of Classification

For University purposes, a student does not acquire a domicile in Maine until he or she has been here for at least one year primarily as a permanent resident and not merely as a student. If the student is enrolled for a full academic program, as defined by the University, it will be presumed that the student is in Maine for educational purposes and the burden will be on the student to prove otherwise. In general, members of the Armed Forces and their dependents are normally granted in-state tuition rates during the period when they are on active duty within the State of Maine.

Subject to the provisions of the preceding paragraph, the domicile of an unmarried minor follows that of the parents or legally appointed guardian. The bona fide year round domicile of the father, if living, otherwise that of the mother, is the domicile of such a minor, but if the father and the mother have separate places of residence, the minor takes the domicile of the parent with whom he or she lives or to whom he or she has been assigned by court order. If neither of the parents are living, the unmarried minor takes the domicile of his or her legally appointed guardian.

Subject to the provisions of the first paragraph, an adult student, defined for the purposes of these rules is one who is either married or 18 years of age or older, will be classified as a resident of Maine if he or she has completed 12 consecutive months of domicile in Maine immediately preceding registration for the term for which residents status is claimed.

Subject to the provisions of the first paragraph, if a non-resident student has a spouse who has a residence in Maine, the student shall be deemed to have a residence in Maine.

**Appeal Procedure**

To change resident status, the following procedures are to be followed:

Submit a "Request for change of residence status" form to the Assistant Vice President for Administrative Services. If the Assistant Vice President for Administrative Service's decision is considered incorrect, the student may appeal the Assistant Vice President's decision in the following order:

1. President
2. Treasurer, University of Maine, Chancellor's Office (This decision must be considered final).

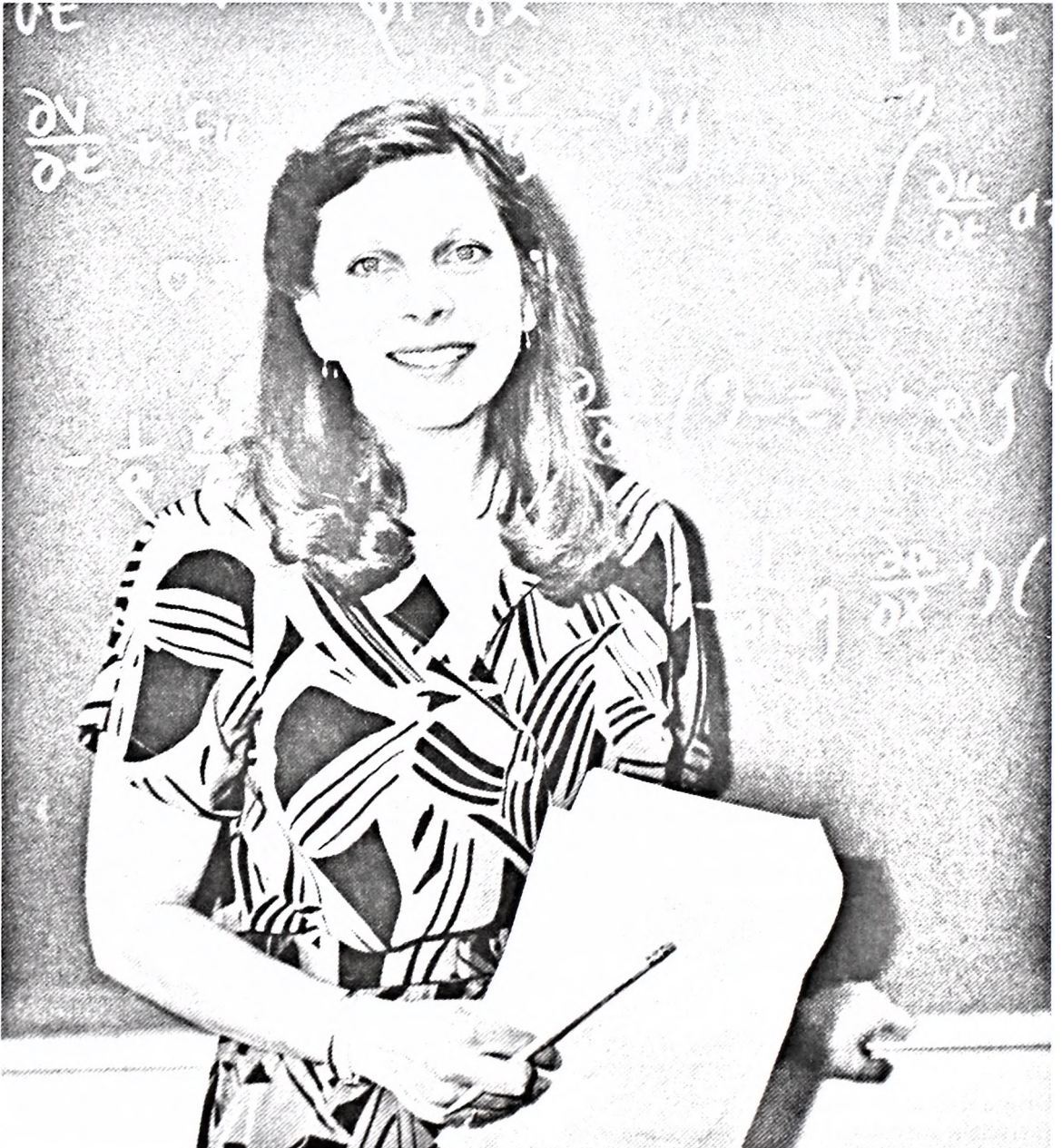
In the event that the Assistant Vice President for Administrative Services possesses facts or

information indicating a change of status from resident to non-resident, the student shall be informed in writing of the change in status and will be given an opportunity to present facts in opposition to the change. The student may appeal the Assistant Vice President's decision as set forth in the preceding paragraph.

No application will be considered for change after September 1 for the fall semester and January 1 for the spring semester.

All changes approved during a semester will be effective for the beginning of the next semester; none are retroactive.

In all cases the University reserves the right to make the final decision as to the resident status for tuition purposes.



# Admission

## Admissions Staff

*Director:* William J. Munsey

*Associate Directors:* Albert F. Hackett, Samory Raschid

*Assistant Directors:* Holly L. Chase, Susan A. Darcy, Kimberly Johnston, Alan D. Whittemore

*Admission Counselor:* Wayne A. Lobley

## Enrollment Management

### Enrollment Management Staff

*Assistant Vice President for Enrollment Management:* Joyce D. Henckler

*Director of Marketing Media:* Pamela Dumas Serfes

*Staff Assistant:* Janet Boucouvalas

The University invites applications from prospective degree candidates without regard to race, color, creed, sex, national origin, handicap or age. The University seeks candidates whose academic credentials, scholastic achievement and motivation indicate promise of success in the University environment.

All correspondence concerning undergraduate admission should be addressed to the Admissions Office, Chadbourne Hall, University of Maine, Orono, ME 04469.

Candidates for admission to the Graduate School should contact the Dean of the Graduate School, 2 Winslow Hall, University of Maine, Orono, ME 04469.

To arrange a campus visit, interview or tour, contact the Admissions Office at (207) 581-1561.

The University of Maine belongs to the National Association of College Admission Counselors, and as such subscribes to the Statement of Principles of Good Practice. Accredited by the New England Association of Schools and Colleges, the University maintains standards of academic excellence and encourages the efforts of secondary schools and colleges to maintain or achieve regional accreditation to provide a measure of academic standards for the admission of degree candidates.

The approval of candidates for admission to University degree programs is on a selective basis. The University notifies candidates between January and mid-April for Fall semester enrollment and between November and early January for Spring semester enrollment. Deadline dates for the application and supporting

academic documents is recommended as a guide to students who also seek University housing and consideration for financial aid. Candidates applying for the fall semester are advised to submit the application and supporting academic documents by February 1. Spring semester applicants are advised to submit the University application and supporting academic documents by November 1. Candidates approved for admission prior to the completion of the academic year are accepted contingent upon successful completion of all academic work and the receipt of a final transcript of grades. The University reserves the right to terminate the acceptance of degree candidates if applicants fail to achieve academic success in course work, or the capacity of the University to provide academic and student support services for the student has been reached.

## Early Notification

Prospective first-year candidates with outstanding academic records are encouraged to apply for Early Notification. December 15 is the deadline to submit the application and all required academic credentials for Early Notification consideration. Successful candidates will be notified in January of the senior year in high school. Confirmation to enroll at the University will require payment of the non-refundable deposit of \$150.00 by May 1. Deposits received prior to May 1 are considered non-refundable deposits.

## International Candidates

Prospective students who are not citizens of the United States are invited to apply for admission as first year or transfer degree candidates. Candidates are required to submit the completed International Admissions Application and an application fee of U.S. \$15.00 payable by an international bank draft or money order. Please submit official or certified photocopies of *all* educational records, the results of the College Board Scholastic Aptitude Test (S.A.T.), and the results of the Test of English as a Foreign Language (T.O.E.F.L.), if English is not the candidate's language. The completed Financial Documentation form and certified

documentation of adequate finances are required before an admissions decision is rendered. Candidates must submit the application, application fee and all required documents by February 1. Any financial documents not in English *must be accompanied by certified English translations*. Educational records must include subjects studied by year, the number of weekly lecture and laboratory hours in each subject, grades, marks or percentages earned in year-end examinations, as well as copies of diplomas, titles, degrees, and certificates. Final documentation must certify that the candidate has adequate funds for study at the University; the documentation must be officially certified or notarized and be less than one year old.

International candidates should contact the Admissions Office for the International Application Packet and assistance with the admissions process. The University is authorized under federal law to enroll non-immigrant alien students.

### Permanent Resident Candidates:

Candidates who are permanent residents of the United States, as evidenced by the resident alien card issued by the United States Immigration and Naturalization Service, must submit a photocopy of *both sides* of their permanent resident card at the time of application. This is required to document the candidate's status with the I.N.S.

### Scholastic Aptitude Test (SAT)

The University of Maine College Board Code is 3916. Candidates for admission are required to submit test results of the Scholastic Aptitude Test (SAT). The ACT examination will be accepted in lieu of the SAT. Candidates for admission to associate degree programs in University College are advised to review the admission and testing requirements of University College programs found in a later section of this catalog. Candidates applying for admission must submit SAT or ACT Test results no later than February 1. Test scores submitted after February 1 may delay the reviewing and notification process for prospective students.

Arrangements to take the College Board SAT should be made with the local high school guidance office. Registration must be completed at least six weeks before the test date.

The College Board will administer tests on each of the following dates during 1989-90.

Saturday, October 14, 1989\*  
 Saturday, December 2, 1989  
 Saturday, January 27, 1990  
 Saturday, March 31, 1990 (SAT only)  
 Saturday, May 5, 1990  
 Saturday, June 2, 1990

Please forward official test results from the Education Testing Service.

### Test of English as a Foreign Language (T.O.E.F.L.)

Candidates whose native language is not English are required to document their proficiency in English by submitting test results from the International Test of English as a foreign Language (T.O.E.F.L.). Permanent residents of the United States (as evidenced by the resident alien card) may be evaluated on a case by case basis depending upon the number of years they have lived in the United States and their fluency in the English language. Candidates who have attended high schools or colleges in the United States may be evaluated based on their academic performance and the length of time they have attended school or college in the United States. In all instances the T.O.E.F.L. is preferred and may be required of any candidate.

### Achievement Tests

College Board Achievement Tests are not required of candidates applying to the University. The Departments of English and Mathematics administer on-campus placement examinations for the purpose of appropriate registration in introductory level courses. The Department of Foreign Languages and Classics offers the Foreign Language Placement Examination for purposes of both placement and credit. Placement testing is available during New Student Orientation and at the beginning of each academic semester.

### Advanced Standing

#### Advanced Placement

The University recognizes advanced academic work completed in secondary schools by

\*SAT only in California, Florida, Georgia, Hawaii, Illinois, No. Carolina, So. Carolina and Texas.

means of Advanced Placement Tests. Candidates interested in advanced placement and credit must take one or more of the Advanced Placement Tests administered by The College Board. Credit is granted for scores of 3, 4, and 5.

### **CLEP (College Level Examination Program)**

CLEP is a national program of credit-by-examination that offers, primarily to the older adult student, the opportunity to obtain academic recognition for college level achievement. Information on the policy of granting credit for CLEP examinations is available from the Admissions Office, the Continuing Education Division and the Office of Testing and Research.

### **Credit by Examination (Academic Departments)**

Students who show evidence of advanced knowledge may be exempt from certain courses and requirements if they pass examinations developed by the academic department. A student who successfully passes such an examination earns course credit as well as exemption from the course. Whether or not students may challenge by exam any particular course or courses is the decision of the unit (department, school, or college) which has immediate academic authority for the course or courses. Students interested in credit by examination should contact the department chair or unit head for further information and fee structure.

### **Mathematics Placement Examination**

Any student planning to register in mathematics courses MAT 111, MAT 112, MAT 113, MAT 122, MAT 123, MAT 126 or MAT 142A is required to take and successfully pass the mathematics qualifying examination administered by the Department of Mathematics. Examinations are administered during New Student Orientation or during the first week of classes.

## **Academic Credit for Prior Learning**

### **Quality Control Principles**

Undergraduate credit for prior learning in any academic discipline may be awarded only by recommendation of regular faculty in that discipline.

To assure that standards are maintained and

that the process assures academic quality, a representative council, appointed by the president, will be responsible for policy and procedure development and monitoring.

Credit may be awarded for demonstrated learning related to specific courses or knowledge and skills incorporating a broad spectrum within a discipline. The academic teaching unit in the related discipline will be the final arbiter for the granting of prior learning credit.

Prior learning credit may be awarded for up to a maximum of 24 semester credit hours in any four year undergraduate degree program and up to a maximum of 12 semester credit hours in a two year undergraduate program. Colleges may elect to establish a lower limit. Nothing in this policy shall apply to transfer of credit from other accredited post-secondary institutions.

### **Procedures**

Any registered student may submit a proposal for prior learning credit for review by a designated learning assessment counselor.

Three methods of learning assessment that may be used include: 1) Written "challenge" examinations; 2) National standard course equivalency recommendations such as the American Council on Education (ACE), National Guide, and 3) Evaluation of portfolio documentation.

### **Written examinations:**

Academic departments may award credit on the basis of challenge examinations prepared by and administered by faculty.

Academic departments may award academic credit using the College Level Examination Program (CLEP).

There is a standard examination fee charged any student who takes the CLEP exam. There is also a charge for the awarding of credit by challenge examination.

### **National Standard Course Equivalency Recommendations**

At the University of Maine, after completing prior learning counseling, a student may submit evidence of the completion of courses which have been reviewed by national bodies such as the American Council on Education for which credit has been recommended. Faculty assessors will review the relevancy of the courses to the student's academic program and award academic credit when appropriate.

In no case will academic credit be awarded in excess of that recommended by the national

body. The college will determine the applicability of the credit to the student's academic goals.

A fee will be charged for processing and researching the course equivalences. No fee will be charged for the credit.

### **Portfolio Assessment**

Any registered student may submit a portfolio documenting college level learning experiences from professional activities, vocational endeavors and significant research or travel that involve college level learning.

Prior to submitting the portfolio, the student may be required to attend a portfolio development seminar or course.

Assessment will be conducted by faculty representing the academic areas in which credit is being requested. Faculty assessors will be selected from appropriate academic departments as recommended by the dean.

An assessment fee will be charged for the assessment process separate and a part from the fee charged for the portfolio development seminar or course. The fee will be related to the cost of the process and not to the amount of credit applied for or awarded. There will be no separate charge for the credit.

### **Administration**

The Vice President for Academic Affairs is responsible for administering the demand for services.

Counseling students and preparing them for the assessment process will be the responsibility of regular advising and counseling personnel. Special training for the counselors will be provided.

Faculty serving on the assessment teams will be compensated appropriately.

There will be an information brochure prepared for students. A copy of the guidelines will be furnished to all personnel who are in contact with students.

Credit awarded will be accepted for degree credit through regularly established procedures for course credit. Pre-approval of the type of credit will be secured from the appropriate department prior to the portfolio review.

The academic department and the dean will determine amount and type of academic credit assessed by the prior learning process that will be accepted toward their degree programs.

## **Early Admission (Junior Year)**

The Admissions Office may consider for early admission high school candidates who have not completed the requirements for the high school diploma. Upon the recommendation of the high school principal and guidance counselor, the University will consider candidates who have demonstrated outstanding academic achievement and whose motivation and matu-





nity reflect a strong desire to pursue a University degree program. Candidates must have completed a minimum three years of college preparatory subjects in high school and submit test results of the Scholastic Aptitude Test or the ACT examination. Candidates are requested to arrange an on campus interview and will also be required to have the support and endorsement of their parents or legal guardian.

## Deferred Admission

It is the policy of the University of Maine to permit approved degree candidates to defer University enrollment for up to one year. The intent of this deferred degree status is to allow students the opportunity to seek employment as a means of saving funds for college or the opportunity to travel and take a "break" from academic study. Deferred admission is not approved for candidates who seek to enroll at any other college, university, or postgraduate year of secondary school study. Candidates approved for deferred admission will be required to submit a non-refundable deposit of \$150 which will be held on account by the University Business Office. Candidates requesting deferred enrollment status must make their request in writing to the Admissions Office prior to August 1 for fall semester enrollment and prior to January 1 for spring semester enrollment.

## Deferred Admission (Active Military Duty)

Candidates approved for admission to the University of Maine who enter active military duty for a period of time which exceeds one year may request deferred enrollment. Upon receipt of correspondence from military candidates, review will be considered on an individual basis. Request must be received by August 1, for candidates who applied for the fall semester and by January 1 for the spring semester.

## Admission to Continuing Education Courses

The University of Maine offers a variety of academic programs through the Continuing Edu-

cation Division. Categories of enrollment in Continuing Education include:

1. Degree Students: Candidates for admission to degree status through the Continuing Education Division must meet all entrance requirements for either undergraduate or graduate degree enrollment. Applications must be filed with the undergraduate Admissions Office or the Graduate School.
2. Non-degree Students: Students interested in taking CED courses for personal or professional enrichment are advised to contact the CED office in Chadbourne Hall for class schedules and registration information.
3. Bachelor of University Studies: The Continuing Education Division offers, through University College, the Bachelor of University Studies degree. Course offerings are through the CED department. Interested candidates should contact the CED Office for more detailed information regarding entrance requirements.

Information and registration materials may be obtained by writing the Director, Continuing Education, Chadbourne Hall, University of Maine, Orono, ME 04469.

## Readmission

Former University of Maine degree candidates planning to return to the campus to resume undergraduate work must contact the Academic Dean of the undergraduate college in which the candidate plans to seek readmission as a degree candidate. Candidates will be notified by the Dean's office of the readmission decision.

## Transfer Candidates

Each academic year the University of Maine enrolls transfer candidates who have successfully completed academic work at colleges and universities from throughout the United States and abroad. Transfer candidates must be in good standing both academically and in terms of student behavior to be considered for transfer admission. Students who have financial indebtedness (unpaid bills) at any other post secondary institutions at the time of application, and thus are unable to secure official transcripts of prior work will not be considered for transfer admission until such time as an official transcript or transcripts have been received in

the Admissions Office. Official transcripts are records mailed directly to the Admissions Office from previous schools or colleges attended.

The admission of transfer students to the University of Maine is determined by the availability of openings in undergraduate degree programs and the competitive academic credentials submitted by candidates.

Candidates applying for transfer consideration are required to have a minimum 2.0 grade point average (on a 4.0 scale). It should be noted that meeting the minimum grade point average does not guarantee transfer acceptance to the University of Maine.

Candidates who desire to transfer to the University of Maine from another college or university of recognized standing, are encouraged to file application with the Admissions Office by November 1 for spring semester and March 1 for fall semester. Applications received after the recommended deadline dates are reviewed based on the available openings within academic colleges and the capability of all university departments to complete work with required documents in a timely manner. Applications must include a statement of the names and addresses of all schools and colleges previously attended. Transfer candidates who have successfully completed a minimum of one year of transferable college course work commensurate with the intended academic field of study at the University, are not required to take the SAT test, if the examination was not previously completed by the candidate. If completed, the SAT or ACT scores should be included on the high school transcript.

Applicants must arrange for official college transcripts to be forwarded from previously attended colleges and universities to the Director of Admissions, University of Maine, Orono, ME 04469. Student copies of academic transcripts are not accepted as official documents.

The following statement was approved by the University of Maine System Board of Trustees on March 25, 1985. The statement serves as current University policy throughout the University of Maine System.

"A student who has been suspended for either academic or disciplinary reasons by one campus of the University of Maine shall not be admitted as a matriculated student by the same or another campus for the next academic semester nor thereafter until the conditions established for termination of that suspension have been met; a student who has been dismissed for either academic or disciplinary reasons by one campus of the University of Maine

shall not be admitted as a matriculated student by the same or another campus for the next academic semester not thereafter until the conditions of the following sentences are satisfied."

A student who has been dismissed or suspended, seeking admission after dismissal or an exception to this policy, shall file a written petition with, and shall interview with the Director of Admission or a designee after filing an application for admission with the Admissions Office. In the petition and interview the student shall present clear and convincing reasons to justify admission as a matriculating student to the campus that satisfactorily negate the likelihood of any repetition of the conduct or conditions which led to such dismissal or suspension."

The evaluation of prior academic work is completed through the academic dean's office of the candidate's undergraduate college after candidates have been approved for admission to the University. Evaluations are normally completed during the spring and summer months once the final transcript has been received. Transcript evaluation for candidates entering the spring semester (January) may be delayed pending the receipt of final records.

Trustee policy is to provide the maximum opportunity for transfer within the University of Maine System. When a student is accepted for transfer within the University of Maine, all undergraduate degree credits obtained at any unit of the system will be transferrable to any other unit, but will not be automatically applied to the specific academic degree program to which the student has entered. Each student will be expected to meet the established requirements of the academic program into which transfer is effected, and appropriate application of that credit is the responsibility of the particular academic unit. To determine which courses are transferrable for degree program credit, students should consult with the academic dean's office or their academic advisor prior to registration.

## Enrollment of Non-Degree Students

Students who wish to enroll in University courses as a non-degree student are required to register through the Continuing Education/Summer Session Office for both day and evening classes. Registration for classes is com-

pleted on a space available basis. Interested students are advised to check with the Continuing Education Office or the academic college or department to determine if any academic pre-requisites are required for course enrollment. Students enrolled in a non-degree status are not eligible to receive financial assistance to meet financial obligations.

## New England Regional Student Program

New England's public state universities and colleges are working cooperatively to increase the number and variety of educational opportunities for college-bound students. Under this cooperative program, qualified New England residents are given preferred admission to New England state universities and colleges in specific academic programs not available in their home states. Students accepted in these programs are also granted the benefit of tuition reduction which is lower than that charged out-of-state students. This plan makes available to the residents of the region a wider variety of academic programs without additional funds to duplicate specialized staff and expensive facilities in each state.

Each New England public institution of higher education involved in the regional student program has designated which of its academic majors are to be offered on a regional basis and maintain control over their own courses and programs.

Undergraduate programs begin during the student's first year of enrollment at the University. Enrolled students who change their major and thus become eligible for the regional major must notify the Registrar's Office at the University. Tuition reduction under the regional program takes effect the semester following notification.

Information may be obtained from any local high school guidance office in New England or from the New England Board of Higher Education, 45 Temple Place, Boston, MA 02111.

## Acceptance Deposit

Students accepted to the University of Maine for the fall semester will be requested to submit a \$150.00 non-refundable acceptance deposit by the Candidates Reply Date of May 1.

Deposits received prior to May 1 are considered non-refundable deposits. Students accepted after May 1 will be requested to submit the non-refundable confirmation deposit within two weeks of notification. The acceptance deposit is credited to the student's account in the University Business Office.

Students accepted to the University of Maine for the spring semester will be requested to submit a \$150.00 non-refundable deposit by January 1. Deposits received prior to January 1 are considered non-refundable.

## Financial Aid and Scholarships

All applicants for financial aid are required to file the Financial Aid Form (FAF) with the College Scholarship Service annually and send the appropriate tax information to the Office of Student Aid. The FAF application is available in each local high school guidance office in the late fall. Requests for financial assistance will be reviewed by the Office of Student Aid after candidates have been approved for admission to the University. The on-time application deadline to file for aid consideration is March 1.

Mailing of the FAF to the College Scholarship Service by mid February is recommended to meet the March 1 deadline. University based financial aid funds are awarded for the academic year (September to May) and, as such, candidates applying for January admission who do not file the FAF by March 1 of the previous spring may be restricted to the PELL Grant and the Stafford Loan (GSL) if financial qualifications have been met.

The University holds membership in the College Scholarship Service (CSS) of the College Board. Participants in CSS subscribe to the principle that the amount of financial aid granted should be based upon financial need. The College Scholarship Service assists colleges and universities and other agencies in determining the family financial contribution to meet college expenses.

Information and FAF forms are available at the Office of Student Aid for upperclass students.

A brochure entitled *Financial Assistance 1990-91* is available, upon request, from the Director of Student Aid or from the Admissions Office. Detailed descriptions of all types of financial aid programs are included. Further in-

formation may be found in this catalog in the section entitled "Office of Student Aid."

## Academic Entrance Requirements

Academic course requirements for admission to the University are established by each undergraduate college. The academic courses listed within each college represent the years of high school study required for admission to the University. Students are expected to complete a college preparatory curriculum which brings to the University classroom developed skills in writing, reading comprehension, reasoning, mathematics, the natural sciences, history and social sciences, foreign languages and the fine arts.

Candidates out of high school who did not complete requirements for the high school diploma must present evidence of successful passage of the General Equivalency Diploma (GED) as approved by the Department of Education.

### College of Arts and Humanities

Subject	Years of Study
English	4
Foreign Language (one language)	2
Algebra (I and II)	2
Plane Geometry	1
History/Social Science	1
Science (Lab)	1
Electives(Academic)	6
Recommended:	
Computer Science	1
Fine Arts	1

### College of Social and Behavioral Sciences

Subject	Years of Study
English	4
Foreign Language (one language)	2
Algebra (I and II)	2
Plane Geometry	1
History/Social Science	1
Science (Lab)	1
Electives (Academic)	6
Recommended:	
Computer Science	1
Fine Arts	1

## College of Sciences

With the reorganization of the science departments into the new College of Sciences effective July 1, 1989, the college will offer at the undergraduate level both the B.S. (Bachelor of Science) and B.A. (Bachelor of Arts) degree programs. Students are encouraged to review degree requirements in the specific academic disciplines within the College of Sciences. Candidates applying to the College of Sciences for admission in September 1990, are advised to have completed the following academic courses.

Academic Courses (required of all candidates);	Years of Study
English	4
Algebra (I and II)	2
Plane Geometry	1
History/Social Sciences	1
Laboratory Sciences	1

### B.S. degree candidates (required or recommended subjects)

Laboratory Sciences: One additional year in either chemistry or physics is required.

Foreign Language: Recommend 2 years of study in one foreign language.)

Computer Science: One year of study is recommended.

Fine Arts; One year of study is recommended.

Mathematics; A senior year of college preparatory mathematics is recommended.

### B.A. degree candidates (required or recommended subjects)

Laboratory Sciences; Recommended: 1 additional year of laboratory science. Foreign Language: Required: 2 years of study in one foreign language Computer Science; Recommended: 1 year of study Fine Arts; Recommended: 1 year of study Mathematics; Recommended: 1 senior year of college preparatory mathematics *Note: Although not required for entrance in September 1990, students are encouraged, for both the BS and BA degree programs, to have at least three years of high school science, four years of mathematics, and two years of one foreign language.*

## The Bangor Campus (University College)

Admission to associate degree programs in University College varies with academic pro-

grams. Candidates should review the University College section of the catalog for more detailed information.

### College of Business Administration

Subject	Years of Study
English	4
Algebra (I and II)	2
Plane Geometry	1
Senior Mathematics*	1
History/Social Science	1
Academic Electives	8
Recommended:	
Computer Science	1
Fine Arts	1

\*A senior year mathematics course is strongly recommended as preparation for students planning to pursue the baccalaureate degree in business administration.

### College of Education

Subject	Years of Study
English	4
Three units from one and two units from another of the following:*	5
Foreign Languages	
Mathematics (College Preparatory)	
Natural and Physical Sciences	
History/Social Studies	1
Academic Electives	6
Recommended:	
Computer Science	1
Fine Arts	1

\*Natural and Physical Sciences, two units of College Preparatory Mathematics and Foreign Languages are strongly recommended. Algebra I, II and Plane Geometry are required if you wish to prepare for a teaching career in mathematics or science.

### College of Engineering and Technology

Subject	Years of Study
English	4
Foreign Language (2 units recommended in one language, but not required.)	2
Algebra (I and II)	2
Plane Geometry	1
Trigonometry	1/2
Physics	1
Chemistry	1
History/Social Studies	1
Academic Electives	4

Recommended:	
Computer Science	1
Fine Arts	1
Advanced or Senior Mathematics	1

Prior to enrollment in analytic geometry and calculus, engineering candidates must take and successfully pass the mathematics qualifying examination administered by the Department of Mathematics. Examinations are administered during New Student Orientation or during the first week of classes.

### School of Engineering Technology

Subject	Years of Study
English	4
Foreign Language (2 units recommended in one language, but not required.)	2
Algebra(I and II)	2
Plane Geometry	1
Trigonometry	1/2
Physics	1
Chemistry (recommended)	1
History/Social Studies	1
Academic Electives	4 1/2
Computer Science (1 unit)	
Fine Arts (1 unit)	

### College of Forest Resources

#### Four-Year Degree Programs

Subject	Years of Study
English	4
Algebra (I and II)	2
Plane Geometry	1
Trigonometry, (or its equivalent) for Forest Engineering candidates	1/2
Lab Sciences	2
Biology	1
Chemistry or Pysics	1
Biology	1
Chemistry or Physics	1
History/Social Science	1
Academic Electives	5
Recommended:	
Trigonometry	1/2
Computer Science	1
Fine Arts	1
Total units	18

#### Two-Year Degree Programs

##### Forest Management Technology

Subject	Years of Study
English	4
Algebra (I and II)	2
Plane Geometry	1

Laboratory Sciences (Biology strongly recommended)	2
History/Social Studies	1

Students who contemplate continuation in a four-year baccalaureate degree curriculum must first complete the two-year associate degree program at a grade point average of 2.50 or higher, and must satisfy entrance requirements to the desired baccalaureate program.

### College of Applied Sciences and Agriculture

Subject	Years of Study
English	4
Algebra (I and II)	2
Plane Geometry	1
Trigonometry (Or its equivalent;	
Bio-Resource Engineering candidates only)/2	
Science (chemistry or physics preferred)	2
History/Social Science	1
Academic Electives	5 1/2-6
Total units	16

### School of Human Development

Subject	Years of Study
English	4
Algebra I and II	2
Plane Geometry	1
Science* (chemistry preferred)	1
History/Social Sciences	1
Academic Electives	7
Recommended:	
Computer Science	1
Fine Arts	1

\*Chemistry required for majors in Human Nutrition and Foods, Health and Family Life Education and Merchandising and Consumer Resources.

### School of Nursing

Subject	Years of Study
English	4
Algebra (I and II)	2
Plane Geometry	1

Biology (Lab)	1
Chemistry (Lab)	1
History/Social Science	1
Academic Electives	4
Recommended:	
Computer Science	1
Fine Arts	1

### Technical Division of College of Applied Sciences and Agriculture

Candidates for admission to a two-year, Technical Division program in the College of Applied Sciences and Agriculture must have graduated from high school or have received a GED certificate and completed the College Board Scholastic Aptitude Test. Candidates should have two units of high school math, one of which must be algebra. The high school math requirement may be fulfilled by non-credit developmental courses at the University. High school chemistry is recommended but not required of students enrolling in the Animal Medical Technology program. Students who contemplate continuation in a regular four-year, baccalaureate degree curriculum must first complete the two-year, associate degree program with a grade point average of 2.50 or higher, and must satisfy entrance requirements to the desired baccalaureate degree program.

### Music Audition (School of Performing Arts)

Candidates seeking admission to music degree programs will be contacted by the Music Department regarding required music audition. Once the application for admission has been reviewed and candidates have been approved for admission to the University.

Non-music majors interested in music organizations are encouraged to contact the Music Department for information concerning participation in chorus, band, orchestra, and other music programs.

# Abbreviations and Symbols

AER Aerospace Studies	EDV Education—Vocational
BRE Bio-Resource Engineering	EDW Education—Workshop
ARE Agribusiness and Resource Economics	EMA Education—Mathematics
ANV Animal and Veterinary Sciences	EML Education—Middle Level
ANT Anthropology	ERL Education—Methods
ART Art	ESC Education—Science
ASA Applied Science and Agriculture	ESS Education—Social Studies
AED Art Education	HED Education—Higher Education
ARH Art History	INM Education—Instructional Media
ARS ARTS-Religious Studies(SM)	SED Education—Special Education
AST Astronomy	STT Education—Student Teaching
BCH Biochemistry	ELE Electrical Engineering
BIO Biology	EET Electrical Engineering Technology
BOT Botany and Plant Pathology	ENG English
BUS Business Management	ENT Entomology
BUA Business Administration	FAA Food Agriculture and Applied Science
CAN Canadian/ American Studies	FOS Food Science
CHE Chemical Engineering	FOL Foreign Languages
CHY Chemistry	FOE Forest Engineering
CHF Child Development and Family Relationships	FMT Forest Management Technology
CIE Civil Engineering	FOR Forest Resources
CET Civil Engineering Technology	FTY Forestry
CLA Classics	FRE French
CLD Clothing, Textiles and Design	FSB Freshman Book Course
COS Computer Science	FSA Freshman Seminar in Advising
DAN Dance	GEE General Engineering
DEA Dental Assisting	GET General Engineering Technology
DEH Dental Hygiene	GEO Geography
DSE Developmental Studies/English	GES Geological Sciences
DSI Developmental Studies/Individual	GER German
DSM Developmental Studies/Mathematics	GRR Graduate Readings
DSR Developmental Studies/Reading	GRE Greek
DSS Developmental Studies/Study Skills	HIT Health Information Technology
DRA Drama	HPR Health, Physical Education and Recreation
ECE Early Childhood Development	HTY History
EAS Earth Sciences	HEC Home Economics
ECY Ecology	HNF Human Nutrition and Foods
ECO Economics	HON Honors
CEC Education—Counselor Education	HOM Consumer Studies, Housing and Management
EAD Education—Administration	HRT Hotel/Restaurant and Tourism
EAE Education—Adult Education	HUD Human Development
EBI Education—Bilingual	HUS Human Services
EDA Education—Measurement and Evaluation	HUM Humanities
EDB/EPT Education—Basic Professional Courses	IND Independent Studies
EDC Education—Curriculum and Instructional Materials	IEI Intensive English Institute
EDG Education—General	INT Interdepartmental Listing
EDF Education—Curriculum and foundations	ITA Italian
EDH/EDL/EDM Education—History and Philosophy	JMC Journalism and Mass Communication
EDS Education—Seminar, Research and Thesis	LAT Latin
EDU Education	LET Legal Technology
	LIB Liberal Studies
	LNM Landscape and Nursery Management
	MAT Mathematics

MEE Mechanical Engineering  
 MET Mechanical Engineering Technology  
 MCB Microbiology  
 MIS Military Science  
 MOY Modern Society  
 MUS Music  
 MUE Music—Education  
 MUH Music—History  
 MUL Music—Literature  
 MUO Music—Organizations  
 MUP Music—Performance  
 MUY Music—Theory  
 NAV Naval Science  
 NRC Natural Resources  
 NUR Nursing  
 NFS Nutrition and Food Science  
 OCE Oceanography  
 ONE Onward—English  
 ONI Onward—Independent  
 ONM Onward—Mathematics  
 ONO Onward—Orientation  
 ONR Onward—Reading  
 ONS Onward—Science  
 PHI Philosophy  
 PEG Physical Education  
 PHY Physics  
 PSS Plant and Soil Sciences  
 POS Political Science  
 PSY Psychology  
 PAA Public Administration  
 PPA Pulp and Paper  
 QUS Quaternary Studies  
 RPM Recreation and Park Management  
 RUS Russian  
 SCI Science  
 SSC Social Science  
 SWK Social Work  
 SOC Sociology  
 SPA Spanish  
 SPS Special Seminars  
 SPE Speech  
 SPC Speech Communication  
 SVE Surveying Engineering  
 TSO Technology and Society Project  
 THE Theatre  
 WLM Wildlife Management  
 WRE Writing Experience  
 WRI Writing Intensive  
 WSI Women's Studies  
 WTY Wood Technology  
 ZOL Zoology

#### Interdepartmental Listings

*Departments listing the course are shown in parentheses.*

INT 143 Tropical Agriculture (PSS)  
 INT 120A Basic and Pathogenic Microbiology  
 (ANV, MCB)

INT 151A Essays on Human Ecology (BIO,  
 ENG)  
 INT 211 Machine Tool Laboratory II and Weld-  
 ing (AEN, MET)  
 INT 219 Introduction to Ecology (BOT, ZOL)  
 INT 224 Sociology of Rural Life (ARE, SOC,  
 SWK)  
 INT 233 Introduction to Engineering (CHE)  
 INT 250 Forum on Food (HUD)  
 INT 265 Meat Technology (ANV, FOS)  
 INT 290 Nuclear War (PHI, PHY, ZOL)  
 INT 319 General Ecology (BOT, ZOL)  
 INT 324 Contemporary Rural Problems (ARE,  
 SOC, SWK)  
 INT 329 The Individual and the Community  
 (ARE, SOC, SWK)  
 INT 360 Economics and Biology of Marine  
 Fisheries Management (ECO, ZOL)  
 INT 375 Field Studies in Ecology (BOT, FOR,  
 OCE, ZOL)  
 INT 380 Pesticides and the Environment (ENT,  
 PSS)  
 INT 385 Computer Hardware Theory (ELE)  
 INT 396 Field Experience (PAA, POS)  
 INT 398 Undergraduate Research Participation  
 (CHE, CHY, ELE)  
 INT 410 Introduction to the Study of Linguis-  
 tics (ANT, ENG, FOL)  
 INT 414 Women in Society (ANT)  
 INT 420 Ecology Laboratory and Field Course  
 (ZOL)  
 INT 438 Food Microbiology (FOS, MCB)  
 INT 444 Integrated Farming Systems (ARE,  
 PSS)  
 INT 445 Agricultural Ecology (PSS)  
 INT 450 Agricultural Pest Ecology (BOT, ENT,  
 PSS)  
 INT 454 Optical Communications (ELE, PHY)  
 INT 458 Culture and Economic Change (ANT,  
 ECO)  
 INT 476 School and Society Study Tour (HUD)  
 INT 480 Sociolinguistics (ANT, SOC, SPC)  
 INT 485 Human Factors Engineering (MEE,  
 PSY)  
 INT 500 Seminar in Quaternary Studies (ANT,  
 BOT, GES, PSS)  
 INT 501 Discourse Analysis (ANT, PSY, SPC)  
 INT 510 Marine Invertebrate Zoology (OCE)  
 INT 530 Econometrics (ARE, ECO)  
 INT 537 The Evolution and Development of  
 Canadian Government and Politics (HTY)  
 INT 539 Ice Ages and Mankind (ANT, BOT,  
 QUS)  
 INT 545 Late Quaternary Paleoecology (BOT)  
 INT 552 Behavior Genetics (PSY, ZOL)  
 INT 563 Marine Benthic Ecology (BOT, OCE,  
 ZOL)  
 INT 640 Seminar in Ecology (BOT, WLM, ZOL)



# College of Arts and Humanities

Edward B. Lavery, *Acting Dean*

## General Information

The College of Arts and Humanities is dedicated to those values and traditions central to the concept of a liberal arts education. It provides training in the knowledge and habits of mind essential to a wide range of careers, to advanced study in its representative disciplines, and to work in the social and natural sciences. The college's various programs of study lead majors and non-majors to participate in and understand the forms, images, and documents through which the human spirit and human society have evolved. Such education gives students an enlightened sense of themselves, their heritage, and their world and prepares them for responsible and active citizenship.

There are 7 departments within the college, offering a total of 15 undergraduate degrees. Unless otherwise noted, all degrees are the B.A. (Bachelor of Arts). The department of music also offers the Bachelor of Music in Performance and in Education.

Art: Art (Studio, Art History, Art Education)

English: English

Foreign Languages and Classics: French, German, Spanish, Russian, Latin, Modern Languages, Romance Languages, International Affairs

History: History, International Affairs

Music: Music (B.A., B.M. Perf., B.M. Ed.)

Philosophy: Philosophy

Theatre/Dance: Theatre

## Degree Requirements

Requirements for the B.A. degree are described in a separate section of this catalog dealing with all B.A. degrees at the University of Maine. Questions pertaining to degree programs in the College of Arts and Humanities should be directed to the appropriate department chair.

## Entrance Requirements

Admission requirements for the College of Arts and Humanities are the same as those for the University and are described elsewhere in this catalog.

## Bachelor of Arts Degree: Requirements, Rules and Regulations, and Special Programs

### Requirements for the B.A. Degree

#### Entrance Requirements

Information on requirements for admission to the University, as well as specific academic preparation necessary for entrance into the a B.A. degree program, is given in full in the Admission section of this catalogue. All deficiencies in entrance requirements must be made up before registering for the junior year.

NOTE: For admission to a B.A. degree program, two years of the same high school foreign language is required. Students who have not fulfilled this entrance requirement must take two semesters (six hours) of a foreign language here for no credit.

#### Academic Advising

The University of Maine is committed to fostering and maintaining a positive relationship between students and their academic advisors. To facilitate the freshman advising experience, all first-year bachelor of arts degree students participate in an advising program for both residential and off-campus students. Residential freshmen will have an opportunity, through their registration for FSA 199 (Freshman Seminar in Advising), to meet on a regular basis with their own advisor and with their own student advising assistant in their respective residential halls. Nonresidential freshmen also will enroll in FSA 199 and will meet on a regular basis with their advisor and their student advising assistant. Students will normally continue with the same advisor during their sophomore year.

In addition to the Collective Advising Program, there are two seminars available for first-year students: FSA 197, Orientation to the College Experience; and FSA 198, Academic and Career Explorations Planning. Both are

offered once a week for one credit, and are graded on a pass/fail basis. The first semester is an important time to sign up for one of these two seminars.

All freshmen will have the opportunity to participate in academic orientation programs conducted in the summer and just prior to the fall semester. These orientations are intended to provide students with knowledge and skills of use in making a successful academic adjustment to college life.

Upon the completion of 53 degree hours (usually during the student's fourth semester), students declare a major; the faculty in the department in which the major is located become responsible for approving her or his course registration during the final two years of academic study.

Special advising options are available, as follows:

**A. Pre-Law Advising.** A comprehensive advising service is available for students interested in attending law school upon graduation from the University. Recognizing that there is no set pattern of undergraduate courses required by law schools, students will be encouraged to give attention to the "Statement on Prelegal Education" of the Association of American Law Schools, which emphasizes the development of basic skills and insights involving education for "comprehension and expression in words, critical understanding of the human institutions and values with which the law deals, and creative power in thinking." Students will be aided in the selection of courses, furnished information on careers in law, the requirements of different law schools, the nature of the Law School Admission Test, when to take it and how to interpret results, and advised of the range of schools to which their records and scores might indicate successful application. Catalogues of a large number of law schools are available. A Pre-Law Society of students meets many times during the year. For further information contact Professor Eugene A. Mawhinney, Pre-Law Advisor, 13B North Stevens Hall.

**B. Premedical, Predental and other Health Professions Advising.** Students interested in medical and dental schools, as well as any other health professions schools, should register in their freshman year with the Health Professions Committee, Chairperson Howard Patterson, 285 or 330 Aubert Hall. This committee provides liaison between the University and medically-related professional schools and works closely with students during the appli-

cation process. Specific information on pre-medical, predental, and preoptometry curricula is provided elsewhere in this catalog (refer to index).

## Bachelor of Arts Degree Requirements

The B.A. degree requirements are designed to ensure that by the end of a student's college career she or he will have been exposed not only to the required courses for the major, but also to a broad range of subjects.

**A. College Composition.** During the first two years, students must demonstrate satisfactory completion of ENG 101, College Composition, with a grade of "C" or above. This may be done in a variety of ways, depending upon the results of a one-hour placement examination which is administered to *all* incoming freshmen during New Student Orientation.

1. Students whose test results indicate readiness for ENG 101 should register for a division of ENG 101 in the appropriate semester, and will receive credit for the College Composition requirement when they have fulfilled course objectives with a grade of "C" or above;
2. Students who score exceptionally well on the placement examination may receive credit by examination for the College Composition requirement and will be so informed by their academic advisors at registration. The credit hours thus earned count towards the 120 credit hours required for graduation;
3. Students whose examinations indicate that they do not meet minimum entrance standards for ENG 101 will be required to enroll in (and pass) ENG 001 as a prerequisite to ENG 101. The credit hours earned in ENG 001 *do not count* towards the 120 credit hours required for graduation.

Additional writing requirements are discussed in the section on distribution requirements which follows.

**B. Distribution Requirements.** Students must distribute some of their course work among each of three areas, as follows:

### Area I

Social Sciences	12 credits
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### Area II

Arts (visual and performing) and Humanities	15 credits
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**Area III**

Natural Sciences and Mathematics	11 Credits
	38
ENG 101 College Composition	3
TOTAL	41

In addition, the following requirements must be met:

1. *Area II (Arts (visual and performing) and Humanities)*: At least three, but not more than six credit hours of the fifteen required in Area II must be taken from the list of courses meeting area requirements in the Visual and Performing Arts. At least nine, but not more than twelve credit hours of the fifteen must be taken from the list of courses meeting requirements in the Humanities.
2. *Area III (Natural Sciences and Mathematics)*: Of the eleven credit hours required in Area III, at least one course must include an associated laboratory. Additionally, a two-semester sequence in a single discipline must be taken from an approved list (e.g., GES 101, 102).
3. *Upper Level Credits*: A minimum of six credit hours in Area I (Social Sciences) and a minimum of six credit hours in Area II (Arts and Humanities) must be taken in upper level courses. Upper level courses are designated as such in each area's listing of courses.

Many individual courses are designated as fulfilling a requirement in one of the three areas indicated above. Students are advised to meet their distribution requirements by taking courses *outside* their own major and as widely distributed as possible throughout the three areas. *A complete listing of courses by area requirement is available in the Office of Student Academic Services and Special Programs, Stevens Hall.*

C. *Credits Outside the Major*: Of the 120 credit hours required for graduation, 72 credit hours are required *outside* the major. If a particular major requires courses in another discipline, either within the same department or in another department, those credit hours may still count towards the 72 hours.

D. *Writing Skills*: In addition to ENG 101, each student is required to take two writing courses, one specified as a "writing experience" course and the other as a "writing intensive" course. Courses which meet these requirements are indicated as such in each area's list of courses. The requirement may be fulfilled with courses from any of the three areas. During the junior year, all B.A. degree students will have to demonstrate writing proficiency in their major.

E. *Foreign and International Perspectives*: Each

student must take at least one, three-credit course which places its primary emphasis on a foreign and/or international perspective, as designated in each area's list of courses. Note: A course designated as "Writing Experience" or "Writing Intensive" may at the same time satisfy credit hour requirements in one of the three general areas, credit hour requirements for a major, and Foreign and/or International Perspectives course requirements. Likewise, a course emphasizing a foreign or international perspective may at the same time satisfy credit hour requirements in one of the three general areas, credit requirements for a major, and Writing-Experience or Writing- Intensive course requirements.

### Requirements in Fulfillment of the Major

On the completion of 53 degree hours, students, in conference with their advisor and with the approval of their dean, select their major subject. The department in which the major subject falls becomes for administrative purposes the student's major department. The major curriculum is the nucleus of related courses selected by the student as representing her or his chief field of interest or major subject. The minimum number of credit hours acceptable for a major, as well as specific course requirements for a given major, are set by the department in which the major resides.

### Foreign Language Requirements

Most departments that offer the B.A. degree have special language requirements or recommendations for B.A. degree students, as follows:

*Note*: Intermediate level proficiency means the equivalent of two semesters of an intermediate level language course; e.g. SPA 203, 204.

ANTHROPOLOGY: Intermediate language proficiency strongly recommended

ART: Intermediate level French or German is required for students who major in art history;

CHEMISTRY: One year of either French, German, or Russian

COMPUTER SCIENCE: The intermediate level of a foreign language is strongly recommended;

ENGLISH: Proficiency at the intermediate level  
GEOLOGY: Students contemplating graduate

work are strongly encouraged to take either French, German, or Russian;

**HISTORY:** Students majoring in History are required to demonstrate intermediate level proficiency in a foreign language through course work or examination;

**JOURNALISM AND MASS COMMUNICATION:** Proficiency at the intermediate level

**MATHEMATICS:** The intermediate level of a foreign language is strongly recommended;

**MUSIC:** One year of a foreign language which can be either the continuation of the language taken in high school or a new language;

**PHILOSOPHY:** One year of a foreign language is recommended for the B.A. degree, two years for those going on to graduate study.

**PHYSICS:** One year of a foreign language is recommended for the B.A. degree, two years for those contemplating graduate study;

**POLITICAL SCIENCE:** At least one year of a modern foreign language beyond the intermediate level for students majoring in international affairs.

**SOCIOLOGY:** Recommended if considering graduate study

**SOCIAL WORK:** Recommended if considering graduate study

**SPEECH COMMUNICATION:** A foreign language course may be elected by the student to meet one of the department's outside requirements;

**ZOOLOGY:** Proficiency at the intermediate level.

In addition, students may elect to fulfill one or more of the B.A. distribution requirements with a foreign language chosen from an approved list.

Students who have presented two years of a high school foreign language for admission will *not* receive credit for an *elementary* course in that particular language unless *five* years have passed between high school graduation and *admission* to a college or University. It is recommended that these students take:

1. An intermediate or advanced course in the high school language (credits earned in those courses count towards the advanced course credits in the humanities category),

OR

2. An elementary course in a new language (credits earned here count towards the introductory course credits in the humanities category).

Any language course (except for elementary courses in the student's high school foreign lan-

guage) can, of course, be taken for credit as an elective. Credits are awarded on a semester basis.

Finding the appropriate level at which to take a language course is essential for success. During New Student Orientation, the Foreign Language Placement Examination will be given to all incoming freshmen for purposes of both placement and credit.

Credit by examination can be achieved as follows:

1. If the score on the Foreign Language Placement Examination is sufficiently high (see following table), the student will receive three hours of degree credit equivalent to the first semester of the intermediate course.
2. As an incentive to continue language study, a student is eligible to receive an additional three credit hours equivalent to the second semester of the intermediate course by skipping an intermediate course and passing with a grade of "B" or better two semesters of language study beyond the intermediate level. For example, a student who scores 580 on the French examination would receive three credits equivalent to French 203. The student would then have the choice of taking French 204, or skipping French 204 and taking FRE 205 and FRE 209 or 210, or an advanced course. A student who completes, for example, a three-hour French course above the intermediate level with a "B" grade or better will receive an additional three credit hours equivalent to French 204. **STUDENTS TAKING FRENCH 203 OR 204 FOR CREDIT CANNOT RECEIVE CREDIT FOR THESE COURSES BY EXAMINATION.**
3. The student who scores extremely high (see following table) will receive six hours of credit equivalent to the intermediate course. It is recommended that these students continue to take advanced courses in the language for which they have demonstrated considerable proficiency.

Exam	Score Range	
	3 Hrs. Credit	6 Hrs. Credit
French	550-670	680 and above
German	560-670	680 and above
Latin	560-670	680 and above
Russian	560-690	700 and above
Spanish	550-710	720 and above

The Foreign Languages and Classics Department accepts Advanced Placement Examinations in Foreign Languages and Literature for degree credit. Scores of four and five on

either examination will receive six credits; scores of three will receive three credits.

Students who did not have two years of the same language in high school are admitted to a B.A. degree program on a "CONDITIONAL" status. They are required to take two semesters (six hours) of the same foreign language without degree credit to remove this "CONDITIONAL" status. Students are expected to make up this deficiency during their first year at the University of Maine.

## Graduation Requirements

In order to graduate, students must be in good academic standing, i.e., not on an academic action, and must have no outstanding deficiencies (check student handbook for specific details). In addition, the following requirements must be satisfied:

1. Minimum completion of 120 degree hours, with an accumulative grade point average of 2.0 ("C" average) in the major and overall. (NOTE: in computing averages, each hour of "A" is multiplied by 4, "B" by 3, "C" by 2, "D" by 1, and "E" by 0)
2. Seventy-two hours of course work outside the major field
3. Satisfactory work in written English, as demonstrated by proficiency examination
4. Satisfactory completion of all distribution requirements
5. Satisfactory completion of writing experience, writing intensive, and foreign/international perspectives course requirements.
6. Satisfactory completion of requirements for the major.

## Rules Pertaining to Credit for the B.A. Degree

The following is a listing of rules and regulations which pertain to the granting of credit towards the required 120 hours for the B.A. degree (this is *not* meant to be an all-inclusive list).

### Away Status

Students wishing to register for "Away" status must be in good academic standing and must obtain *prior approval* from their academic advisor and dean (approval and registration forms are available in the Office of Student Academic

Services and Special Programs, Stevens Hall). Course equivalencies should be determined *prior* to registration. For further details, check the Student Handbook.

Before students pursue Summer Session courses in *any* institution (including UM), they must be in good academic standing and secure the approval of their dean and the chairperson of the student's major department *if they expect degree credit for such work*. A prior approval form is available in the Office of Student Academic Services and Special Programs, Stevens Hall.

### Military Science

B.A. degree students do not receive degree credit for military science courses (Air Force, Army, or Navy ROTC) until they are in their junior and/or senior year. A maximum of 10 hours of advanced level military science courses may count towards the 120 degree hour requirement.

### Pass/Fail

Students who have achieved sophomore standing and who have an accumulative grade point average of 2.0 or better are eligible to take one course a semester on a "Pass/Fail" basis. However, courses which are required for the B.A. degree and courses taken in one's major field or closely related fields may not be taken on a "Pass/Fail" basis. A grade of "D" or better is graded as a "Pass." Although "Pass" grades are not used in computing grade point averages, the credit thus earned is counted for degree credit. The "Pass/Fail" option may be added, deleted, or changed from one course to another only during the first two weeks of the Add-Drop period.

### Physical Education

B.A. degree students may receive credits for PHE 101 and PHE 102 (Physical Education) as an elective course. Students may earn up to two credits in Physical Education (HPR/PHE) *skills* courses applicable towards the 120 total needed for graduation. Physical Education is *not* required for graduation. NOTE: Many Physical Education courses are designated as HPR (Health and Physical Recreation).

### Problems Courses

Field experience, practica, and independent study (readings, etc.) are normally taken in the

student's major. Problem courses, practica, and independent study courses *outside* the student's major, and especially outside the student's college, require special prior permission from the academic advisor and dean. A maximum of 12 credit hours in practica or field experience may be counted towards the 120-hour degree requirement.

## Transfer Credit

All students who transfer to University of Maine from another institution must earn a minimum of 30 hours of "Orono" courses to qualify for the B.A. degree. Degree credit will normally be allowed for courses in which grades of "C" or above have been received. Evaluation of such courses for approval of degree credit and possible equivalency rests with the Dean of the student's college.

A number of agreements have been formalized with other institutions for the acceptance of transfer degree credit. One example is the *Bangor Theological Seminary*. Regularly enrolled students in B.A. degree programs may register for courses at the Bangor Theological Seminary, not to exceed six credit hours per semester, without payment of additional fees. A like privilege is extended to students regularly enrolled at the Bangor Theological Seminary. Such registrations must have the approval of the academic deans of both institutions and the instructors involved. Credit for courses so taken will be considered a part of the student's program at the institution where enrolled.

While enrolled at the Bangor Theological Seminary a student may, with the approval of the dean and the admissions office, take courses at the University of Maine on the established fee basis for such courses. Work so taken, if it does not substitute for or duplicate courses taken in the Seminary program, may be counted as advanced standing credit toward the degree in the event a student later registers for a degree program at the University.

Examples of other institutions where formalized agreements exist are: College of the Atlantic; University College; Canadian universities; University of Salzburg; Denmark International Studies, University of Copenhagen, and miscellaneous other overseas institutions. Specific details are available through the Registrar's Office or the Office of Student Academic Services and Special Programs, Stevens Hall.

## Degree Options

In addition to traditional programs leading to a single four-year degree in a specified subject area, a variety of options exist.

### Double Major

Double majors are permitted between most disciplines at the University of Maine. The requirements for meeting the double major state that a student must meet all requirements of two separate and distinct disciplines. Students also may obtain a double major or double degrees *across* colleges by satisfying the requirements for both colleges and majors. Students intending to become candidates for double majors or degrees across colleges must declare their intent to the deans of both colleges no later than the beginning of their junior year.

### Dual Degree Program in Engineering Technology and Arts and Humanities, Social and Behavioral Sciences, or Sciences (ASSET)

The faculty of the three colleges listed above, along with Engineering Technology faculty, have explored ways to integrate studies in the humanities, social sciences, science, and technology at the University of Maine. The objective is to provide opportunities for students to develop expertise in technology and engineering techniques and to build strong, coherent backgrounds in the liberal arts and sciences, thus enabling students to understand the complex relationships between technology and human affairs. To meet this objective, dual degree programs have been instituted. The programs, open to highly qualified students (minimum combined SAT score of 1100), will require a major a B.A. discipline and a major or minor in a specific area of engineering technology:

1. A five-year program, requiring 150 credit hours, will lead to both the Bachelor of Arts degree and the Technology degree.
2. A four-year program, requiring 135 credit hours, will lead to a Bachelor of Arts degree and an Associate Degree in an area of Engineering Technology.

For further information, contact the appropriate dean's office.

## Bachelor of Arts in Special Studies (BASS)

A limited number of B.A. degree students are permitted to construct for themselves special "majors" other than those presently existing. Such students might: (1) be from such groups as the Onward Program, (2) have special backgrounds such as the military, business, the ministry, etc; (3) be especially gifted in such things as mathematics, computer science, physics, or languages, political experience, law, etc., and for whom the traditional major unduly restricts their unusual and unique abilities. The program is centered in the Office of Student Academic Services and Special Programs, and is administered by a Special Studies Committee appointed by the Dean. It is limited to approximately 50 students, who will declare a BASS major at the usual time in their sophomore year. All B.A. degree requirements must be met. Additionally, students must have been in the program for their last 28 hours, and at least 60 hours must be taken in upper level courses.

## Interdisciplinary Course Concentrations (ICC'S)

The purpose of the Interdisciplinary Course Concentration is to provide students with the opportunity to integrate substantive material and understandings across several formal disciplines, thus to broaden their perceptions in a systematic and controlled fashion. Like the major, the concentration is directed toward a special learning goal rather than to a special category of student. All students who are in good standing are invited to declare an interdisciplinary course concentration (i.e., fully matriculated students neither on probation or any other form of limited academic acceptance). To receive interdisciplinary credit a student must earn at least a 2.0 ("C") in each course in a given concentration. Successful completion of an ICC is noted on the student's transcript.

Students intending to declare an Interdisciplinary Course Concentration should do so during the second semester of their sophomore year. In some cases it may be desirable to declare a concentration earlier, and permission may be granted to declare a concentration later in a student's undergraduate career. A form for declaring an ICC may be obtained from the Office of Student Academic Services and Special Programs, Stevens Hall.

The following is a list of the Interdisciplinary Course Concentrations available along with the Faculty Coordinator for the concentration.

*Canadian Studies*, Assoc. Prof. Victor Konrad,  
Canada House

*Classical Studies*, Asst. Prof. Kristina Passman,  
Little Hall

*Developmental Disabilities*, Prof. Barbara  
Czavinszky, Merrill Hall

*Environmental Issues and Ecological Studies*, Prof.  
Melvin Gershman, Hitchner Hall

*Franco-American Studies*, Asst. Prof. Raymond  
Pelletier, Little Hall

*Geography*, Asst. Prof. Stephen Hornsby,  
Canada House

*Latin American Studies*, Prof. James Acheson, S.  
Stevens Hall

*Legal Studies*, Prof. Erling Skorpen, The Maples

*Linguistics*, Assoc. Prof. Henry Munson, S.  
Stevens Hall

*Marine Resources*, Prof. Robert Bayer, Hitchner  
Hall

*Marxist-Socialist Studies*, Prof. Douglas Allen,  
The Maples

*Medieval Studies*, Asst. Prof. Linne Mooney,  
Neville Hall

*Peace Studies*, Assoc. Prof. Michael Howard,  
The Maples

*Public Relations*, Assoc. Prof. Warren Burns,  
Stevens Hall

*Religious Studies*, Assoc. Prof. Jay Bregman,  
Stevens Hall

For descriptions of each of the above programs, including participating faculty, program descriptions and course selections, refer to the index.

## International Affairs

A major in international affairs is available, with concentrations in anthropology, economics, foreign languages, history, or political science. For complete information, refer to "International Affairs" in the index.

## Medical Technology

A degree in medical technology is offered by the Zoology Department in the College of Sciences in cooperation with the Eastern Maine Medical Center, Bangor and the Maine Medical Center, Portland. Students electing this program spend three years at the University of Maine, following which they undergo a period of 12 months in training at one of the previously

mentioned hospitals. Students receive the degree of bachelor of arts when they have satisfactorily completed the program.

The work at the University also meets entrance requirements of other schools of medical technology which are not affiliated with the University of Maine. A special examination is given nationally, and a certificate in medical technology issued when this examination is passed.

For further information, see the description of Zoology.

### Provisional Certificates for Teachers

Certification for secondary school teaching may be earned by students registered in a B.A. degree program. Twenty-four hours of basic work (EDB 202, EDB 221, EDB 204, SED 400, one methods course, a practicum experience, one curriculum course, a student teaching seminar, and student teaching) meets the professional subject requirements for the General Secondary Provisional Certificate, which must be renewed after two years. One full semester of student teaching is required for certification.

In addition to the 24 hours in professional courses, completion of a 36-hour concentration in one academic subject commonly taught in secondary schools is required.

All students must have an overall grade point average of at least 2.5 to enter student teaching.

Students planning on teacher certification should ascertain in advance whether their planned area of academic concentration is acceptable. *Because students must meet both the State and College of Education requirements, it is recommended that students wishing to become certified should contact the College of Education early in their academic career.* Information may be obtained in the dean's office in the College of Education.

### Premedical, Predental, and Preoptometry Studies

Medical, dental, and optometry colleges in general desire students who are not only well prepared in the sciences and mathematics but who also are broadly educated. To the first point, they require certain courses in biology, chemistry, mathematics, and physics; to the second, they recommend a liberal background in the humanities and the social sciences. In order to meet the minimum requirements of

most medical, dental, and optometry schools, students choosing to obtain a B.A. degree should plan, with the aid of their advisors, to include the following specific courses within the framework of their major program, all to be completed before the senior year:

CHY 111/112 General Chemistry	8
OR	
CHY 113/114 Chemical Principles	8
CHY 251/252 Organic Chemistry	
Lecture	6
CHY 253/254 Organic Chemistry	
Laboratory	4
Two Sem. English Composition or	
Literature	6
PHY 111/112 General Physics	8
OR	
PHY 121/122 Physics for En-	
gineers and Physical Scientists	8
BIO 100 Basic Biology	4
AND	
ZOL 204 Animal Biology	4

Most medical, dental, and optometry schools will accept advanced placement in lieu of one or more of these subjects.

Chemistry and Biology should be taken in the freshman year.

Many medical, dental, and optometry schools require or recommend certain additional courses. Among those most commonly listed are the following:

- Calculus
- Psychology
- Microbiology
- Physiology
- Principles of Genetics
- Quantitative Analysis
- Comparative Anatomy
- Biochemistry
- Physical Chemistry
- Computer Science

Although most premedical, predental, and preoptometry students major in a science, they may major in any of the non-science departments according to their interests. The student would be well advised, however, to take a program during the first two years that will allow the greatest possible freedom of choice in later selecting an undergraduate major. The freshman year specimen curricula given for majors in chemistry, physics, or zoology will leave many options open. Those who major in a non-science department and meet only the minimum science and mathematics requirements should achieve superior grades in order to demonstrate their proficiency in these critical sub-



jects. Students interested in medical, dental, and optometry schools should register at the beginning of their freshman year with the Health Professions Committee (Chairman Howard Patterson, 285 Aubert Hall). This committee provides liaison between the University and medical, dental, and optometry professional schools and works closely with students during the application process. Applicants should take the appropriate admissions test during the spring semester of their junior year.

Students should be familiar with the admission policies of professional schools to which they plan to apply. They also must meet the requirements of the undergraduate college and department in which they plan to major.

## Special/Support Programs

In addition to the various degree options listed above, several support programs have been developed to provide additional assistance and flexibility to B.A. degree students in designing their academic curriculum and augmenting their horizons, as follows:

### Honors Program

Freshmen of marked academic ability are invited to apply for admission to the University Honors Program. The work of the freshman and sophomore years, under the direction of staff drawn from all colleges of the University, provides the stimulus and guidance which should enable a superior student to begin building a balanced view of the liberal arts and sciences and to lay the foundation for the more specialized work which is to come. The Honors Program reaches its peak in a project which is written during the senior year and treats of some special area within the student's major field. Students may be admitted at any stage of the Honors Program up to the opening of the junior year. HON 101, 102, 201, 202, and 301 are taken in common with students of all colleges within the University. These courses, plus HON 498 and 499, constitute the core of the Honors Program. Formal recognition is conferred following a successful completion of the Honors Program, in the form of graduation honors of three grades: honors, high honors, highest honors.

The Honors Committee of each college consists of faculty currently teaching in the program, as well as departmental representatives

selected by the Chairs and ratified by the Dean. The principal duties of this committee are to serve on Senior Thesis Examinations and to serve as a liaison between departments and the Honors Program. Each college has its own Honors Secretary.

## Projects in Learning

Projects-in-Learning consists of several component programs which are experimental in nature, and are designed to offer to qualified students an opportunity to explore in depth subjects not normally dealt with in the curriculum:

1. *Independent Study (IND 200)* is available to students with an accumulative point average of 2.5 or better and with second semester freshman standing or above. Independent study projects are arranged between the instructor and student. An instructor helps the student shape a project, and is available for guidance at all times; however, emphasis is on the word *independent* and the student is encouraged to work on his or her own. Independent study projects can be used to satisfy major requirements with the prior approval of the department head.

2. *Special Seminar (SPS) Program.* Each semester, seminars dealing with topics not covered in depth in regular courses are offered to students who have an accumulative point average of 2.0 or better, and have second semester freshman standing or above. Emphasis is placed on topics of concern to interested students and faculty and range from those dealing with contemporary social problems to those designed to explore the unusual and provocative. Special seminars carry degree credit but do not satisfy any University, college or departmental requirements.

The Projects-in-Learning Program is directed by a supervisory committee which must approve all project work. Students, faculty, and administrators are encouraged to formulate and submit imaginative proposals to the committee which consists of four faculty members and four students. Eligible students may take the freshman seminar and up to four "projects" in their last three and one half years but not more than one each semester. All projects work is graded "Pass" or "Fail."

Information on Projects-in-Learning may be obtained from any Projects-in-Learning Committee member or from the Office of Student

Academic Services and Special Programs, Stevens Hall.

## Cooperative Education

Cooperative Education/Field Experience at the University of Maine includes many forms of experiential learning opportunities that relate to the student's academic objectives and supplement classroom theory. Cooperative Education provides a year or more of practical work experience integrated with eight semesters of classroom courses. The work can be alternated with class work on a part-time basis or full-time during the school term. Field experience is a general term applied to many types of experiential learning.

All work-learning experiences are eligible for credit under the specific requirements of each academic department. To receive credit, a student must register for the course prior to completing the experience and it must relate to the student's academic major. Most departments require junior to senior standing for the awarding of credit. The Cooperative Education Office is located in Wingate Hall, Orono, 581-1344.

## Study Abroad

Students who are in good academic standing are encouraged to consider study abroad. A variety of opportunities are available for spending a year, a semester, or shorter periods (e.g. a summer) studying in a foreign country. Study abroad is especially popular as a junior-year option, but programs exist which are appropriate to other levels. Programs are available in a wide variety of English-speaking and non-English speaking countries, including Canada, France, Austria, Germany, Brazil, Spain, Australia, and the British Isles.

In the case of study abroad programs sponsored by the University of Maine, students will register for the appropriate UM course. Academic credit for such courses will be awarded in the same manner as for any other UM course. In cases where the student registers for study in another institution (e.g. a foreign university or a study abroad program offered by another accredited American university) the student should register for "Away Status". In these cases, credit will be transferred from the host institution according to policies set by the dean and the chair of the student's major department; such transferred credit is not normally

included in calculating a student's grade point average.

Students who are interested in study abroad options should contact the Study Abroad Office on the third floor of Alumni Hall. It is necessary to discuss plans for foreign study with the student's advisor and with the dean's office, to insure that the intended study will be appropriate to the student's overall academic

## University Affiliated Program (UAP)

A University Affiliated Program with the Department of Pediatrics at Eastern Maine Medical Center and several colleges at the University of Maine is available to qualified undergraduate and graduate students. This program provides students with an opportunity to learn about developmental disabilities within an interdisciplinary context. The key features of the program are: (1) a practicum experience in the Behavioral Child Developmental Pediatrics Program at Eastern Maine Medical Center or with one of the cooperating agencies, and (2) a series of seminars given by professionals who work with disabilities, such as: child development specialists, educational specialists, nutritionists, pediatricians, physical therapists, psychologists, psychiatrists, social workers, and speech therapists.

Through these experiences, students will develop an appreciation of the many factors affecting development. Students will develop special skills, but will also see how their own specialty can cooperate with other disciplines to provide the most beneficial treatment program for an individual.

Undergraduate students majoring in Art/Art Education, Child Development/Family Relations, Education, Food and Nutrition, Health and Human Services, Nursing, Psychology, Physical Education and Recreation, Sociology, and Social Work are eligible. Students will be selected after having satisfactorily completed a sequence of basic courses in Developmental Disabilities and after having met specific department requirements for the UAP. Undergraduates participate in a practicum and in an interdisciplinary seminar series (see Interdisciplinary Concentration in Developmental Disabilities).

Graduate students in Child Development, Human Nutrition, Psychology, Special Education, and Speech Communication are eligible.

Each graduate student will participate in an individually designed practicum specific to his or her discipline. Students will be selected on

the basis of interest and background. In conjunction with the practicum, students will participate in an interdisciplinary seminar series.

## Art

Professors Lewis (Chairperson), Hartgen (Emeritus); Associate Professors Decker, De Moulpied, Ghiz, Groce, Linehan; Assistant Professors Barzman, Hicks, Rushing, Shepard

### The B. A. Degree

The Art Department, as part of the College of Arts and Humanities, offers the opportunity to study studio art and art history within a strong liberal arts curriculum. It also is possible to complete requirements for art teacher certification.

### Studio

The Art Department offers the B. A. degree in art with a concentration on studio art. The concentration consists of 36 credit hours in studio art (ART) and 12 credit hours in art history (ARH). It also is possible for interested students to take an enriched studio option (48 hours in studio, 12 hours in art history). The emphasis of the art program is creative studio work in the areas of drawing, painting, printmaking and sculpture. Elective studio work occasionally is available in photography and graphic arts. Art history is seen as necessary to intelligent studio development, as is the socializing of the student to the attitudes, philosophies, language, etc., of the contemporary art world.

The studio degree can lead to (1) specialized work as an artist in one of the fine art areas, (2) graduate study in studio art, (3) art related jobs in commercial art, layout, or design. It should be noted, however, that in this specific area we do not offer a specialized program of study.

### Art History

The Art Department also offers the B. A. degree in art with a concentration on the history of art. Through study of the chief artistic achievements of the human race from ancient times to the present in introductory and intermediate survey courses, the concentration develops in-

sight into the nature of architecture, sculpture, painting, and other arts, their interconnections, and relation to their social context. Advanced courses develop a critical understanding of art, explore methodologies for its interpretation and evaluation in the historical context, and offer the exploration of special problems. Recognizing that art is essentially a visual rather than verbal experience, two studio courses are required in order to provide insight into the artist's point of view and special problems confronting the artist in the making of art. The concentration is part of an appropriate preparation for a career in museums, galleries, art libraries, art education, journalism and other art related contexts, and for further study of art at the graduate level.

The concentration in art history consists of 30 credit hours in art history (ARH) and 6 credit hours in studio art (ART). The following courses are required:

ARH 155/156 Art History I and II	6
ARH 352 Materials and Methods in Art History	3
ART 101 Drawing I	3
ART 121 Basic 3-D Design	3
	<u>15</u>

Seven additional elective courses in art history (ARH)\* are required, at least one of which must be at the ARH 300 level or higher. In addition, the seven courses must be selected from at least five of the following six divisions in the history of art: Classical, Medieval, Renaissance, Baroque and 18th Century, 19th Century, and 20th Century.

TOTAL CREDITS	<u>21</u> 36
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It is also required that the major acquire intermediate level proficiency in a foreign language, preferably German or French.

### The B. S. Degree: Art Education

Majors in art education follow a curriculum developed in cooperation with the College of Education leading to certification as an art teaching specialist in the State of Maine, grades K-12. This course of study includes: 33 hours of College of Education requirements; 27 hours of professional education and art education requirements; 33 hours of art studio (27 in required courses, six in studio electives); 15 hours of art history, including Art Theory and Criticism (ARH 351); and 18 hours of liberal arts electives. In order to complete the 126 credit hours required for graduation, art education students must take 9 hours of course work during May terms, summer sessions, or as an overload (over 15 hours per semester).

### Options in Art Education

Art education today is a field of research, study, and practice which has expanded beyond public school art teaching. Undergraduate study in art education not only prepares a student for teaching certification, but also for graduate work in specialized areas of art education and related fields of study. Some art education majors choose careers in museum education, art therapy, community arts education, arts administration, or other fields which involve working closely with people and art. The Art Department offers several options within the

basic course of study in art education. Among these are an enriched studio option, and the Developmental Disabilities Interdisciplinary Concentration in affiliation with the Behavioral and Developmental Pediatrics Center at Eastern Maine Medical Center and its cooperating agencies. (See the University Affiliated Program, UAP in Index.) This concentration offers art and art education students an opportunity to develop understanding of the complex factors affecting the developmentally disabled. Students choosing this option may be preparing to work with mainstreamed students in public schools or to go on for graduate study in art therapy. The Developmental Disabilities concentration requires 15 hours of courses in both normal and abnormal development and a three credit hour practicum at EMMC or a cooperating agency. These courses are counted as liberal arts electives.

The final option is for students in the B. A. program in the Art Department who may wish to prepare for certification as an art teaching specialist in the State of Maine, K-12. Such students may take the 27 hours of professional education and art education requirements, including student teaching. These are counted towards electives in the B. A. program. Often, students selecting this option must take their student teaching in a ninth semester.

## Specimen Curriculum for B. A. Degree in Art: Studio

Freshman Year			
First Semester		Second Semester	
ART 101 Drawing I	3	ART 102 Drawing II	3
ART 111 Basic 2-D Design	3 OR	ART 121 Basic 3-D Design	3 OR
ART 121 Basic 3-D Design	(3)	ART 111 Basic 2-D Design	(3)
Distribution Requirements, Area I, II or III	6	Distribution Requirements, Area I, II, or III	6
Elective or ENG 101	3	Elective or ENG 101	3
	<u>15</u>		<u>15</u>
Sophomore Year			
First Semester		Second Semester	
ART 221 Introduction to Sculpture	3 OR	ART 221 Introduction to Sculpture	3 OR
ART 201 Intermediate Drawing*	(3) OR	ART 202 Figure Drawing*	(3)
ART 241 Introduction to Printmaking	(3)	ART 234 Basic Painting II	3
ART 233 Basic Painting I	3	ARH 156 Art History II	3
ARH 155 Art History I	3	Distribution Requirements, Area I, II, or III	6
Distribution Requirements, Area I, II, or III	6		<u>15</u>
	<u>15</u>		

\*ART 221 is required, and may be taken in either the Fall or Spring semester. Either ART 201 or ART 202 is required in the alternate semester.

Junior Year			
First Semester		Second Semester	
ART 241 Introduction to Printmaking	3	ART 321/333 Advanced Studio Problems	3 OR
ARH Art History	3	ART 242 Intermediate Printmaking I	(3)
Distribution Requirements, Area I, II, or III	5	ARH 262 Modern Art	3
Electives	4	Electives	6
	<u>15</u>	Distribution Requirements, Area I, II or III	<u>3</u>
			<u>15</u>

Senior Year			
First Semester		Second Semester	
ART 321/333 Advanced Studio Problems	3	ART Elective (e. g., ART 282, 321, 333, 341, 397, e. g.)	3
Electives	<u>12</u>	Electives	<u>12</u>
	<u>15</u>		<u>15</u>

### Specimen Curriculum for B. A. Degree in Art: Art History

Freshman Year			
First Semester		Second Semester	
ARH 155 Art History I	3	ARH 156 Art History II	3
Distribution Requirements, Area I, II, or III	6	Distribution Requirements, Area I, II or III	6
Electives or ENG 101	6	Electives	6
	<u>15</u>		<u>15</u>

Sophomore Year			
First Semester		Second Semester	
ARH 162-263 Art History	3	ARH 162-263 Art History	3
ART 101 Drawing I	3	ART 121 Basic 3-D Design	3
Distribution Requirements, Area I, II or III	6	Distribution Requirements, Area I, II or III	6
Elective	3	Elective	3
	<u>15</u>		<u>15</u>

Junior Year			
First Semester		Second Semester*	
ARH 162-263, 361, 397-498	6	ARH 162-263, 361, 397-498	6
Distribution Requirements, Area I, II or III	3	Electives	4
Electives	6	Distribution Requirements, Area I, II or III	5
	<u>15</u>		<u>15</u>

\*Junior Year English Proficiency must be satisfied this semester

Senior Year			
First Semester		Second Semester	
ARH 351 Art Theory and Criticism	3	ARH 352 Materials and Methods in Art History	3
Electives	<u>12</u>	Electives	<u>12</u>
	<u>15</u>		<u>15</u>

## Specimen Curriculum for B. S. Degree in Art Education

Freshman Year			
First Semester		Second Semester	
ART 101 Drawing I	3	ART 102 Drawing II	3
ART 111 Basic 2-D Design	3	ART 121 Basic 3-D Design	3
ARH 155 Art History I	3	ARH 156 Art History II	3
HTY 105 History of European Civilization I	3	HTY 106 History of European Civilization II	3
ENG 101 Freshman Composition	3	ENG English Elective	3
	<u>15</u>		<u>15</u>

Sophomore Year			
First Semester		Second Semester	
ART 233 Basic Painting I*	3	ART 234 Basic Painting II**	3
EDB 202 The American School	3	EDB 221 Educational Psychology	3
AED 271 Teaching Materials for Art Education	3	Math or Science Requirement	3
Math or Science Requirement	3	Theater or Music Course	3
ENG English Elective	3	SPC 102 Fundamentals of Interpersonal Communication	3
	<u>15</u>	OR	-
		SPC 103 Fundamentals of Public Communication	-
			<u>15</u>

\*Students wishing to stress sculpture take ART 221 instead of ART 233.

\*\*Students wishing to stress sculpture take ART 321 instead of ART 234.

Junior Year			
First Semester		Second Semester	
ART 221 Introduction to Sculpture	3 OR	ART 221 Introduction to Sculpture	3 OR
ART 201 Intermediate Drawing*		ART 202 Figure Drawing	
ART 241 Introduction to Printmaking	3	ART Studio Elective**	3
ARH 351 Art Theory and Criticism	3	ARH 262 Modern Art	3
AED 372 Foundations and Curriculum in Art Education	3	AED 373 Curriculum and Methods in Art Education	3
PSY 100 General Psychology	3	PSY 323 Child Psychology	3 OR
	<u>15</u>	PSY 324 Psychology of Adolescence	
			<u>15</u>

\*Take either ART 201 or 202, but not both. ART 233 should be taken here by sculpture students.

\*\*ART 234 for sculpture students.

Senior Year			
First Semester		Second Semester	
ARH Art History	3	STT 494 Full Day Student Teaching**	12
ART Art Elective*	3		
Electives (Liberal Arts)	9		
	<u>15</u>		

\*Choose 1 from among ART 282, 321, 333 etc. , or courses from other departments with Art Chairperson's approval.

\*\*In order to complete the 126 credit hours required for graduation, art education students must take 9 hours of course work during May terms, summer sessions, or as an overload (over 15 hours per semester).

**Courses in Art**

Most studio courses require that the student purchase a basic supply of necessary tools and equipment.

The Art Department utilizes a collection of 35,000 slides, 10,000 reproductions, and 4,200 original works of art in its teaching programs. There is also a year-round program of exhibitions in the many galleries on campus sponsored by the University of Maine Museum of Art.

**Courses in Art****ART 101 Drawing I**

The fundamentals of drawing: creative exercises exploring the principles of line, value, texture, space, and form. Various media and their relationship to expression and composition are also stressed. Lab 6. Cr 3.

**ART 102 Drawing II**

A continuation of the fundamentals of drawing. Prerequisite: ART 101. Lab 6. Cr 3.

**ART 111 Basic 2-D Design**

Fundamentals of 2-D design through studio experience. Emphasis on pure design. Analysis of design, their relationships and organization and basic perceptual and aesthetic aspects of color. Lab 6. Cr 3.

**ART 121 Basic 3-D Design**

Study of 3-D design principles. Learning fundamentals through studio exercises in form and space utilizing basic media and techniques. Lab 6. Cr 3.

**ART 131 Fundamentals of Painting I**

Basic introductions to the painting art. Exercises in color, technique and composition. Studio and outdoor subjects. All media. Prerequisite: ART 102 or permission. (Not open to art majors). Lab 6. Cr 3.

**ART 132 Fundamentals of Painting II**

Exercises in color, technique, and composition. Studio and outdoor subjects, all media. Prerequisite: ART 131 or permission. (not open to art majors). Lab 6. Cr 3.

**ART 161 Basic Photography**

Fundamentals of black and white photography, including film processing, printing and print control, camera basics, exposure, photographic history, lighting, and the art of photography. Prerequisite: Art majors must have advisors' permission; Arts and Humanities credit. Cr 3.

**ART 201 Intermediate Drawing**

Advanced study of the unique characteristics of various drawing media charcoal, conte, pencil, ink, silverpoint. Stress will be on the ability to create imaginative and expressive compositions. Prerequisite: ART 102. Lab 6. Cr 3.

**ART 202 Figure Drawing**

Creative drawing based on the human figure. Stress is on understanding the basics of form and structure in human anatomy and incorporating this understanding with technical and aesthetic mastery of drawing concepts. Prerequisite: ART 102. Lab 6. Cr 3.

**ART 211 Graphic Design I**

The design of booklets, catalogs, magazines, newspapers, posters, etc. Exercises in lettering and layout. Prerequisite: ART 111 or permission. Lab 6. (Given on sufficient demand.) Cr 3.

**ART 212 Graphic Design II**

The design of booklets, catalogs, magazines, newspaper, posters etc. Exercises in lettering and layout. Prerequisite: ART 211 or permission. Lab 6. Cr 3.

**ART 221 Introduction to Sculpture**

Study of sculpture form and expression (control and understanding of spatial relationships). Deals with the manipulation of space and materials through bending, forging, carving, casting, and joining. In addition, the students are expected to familiarize themselves with the machines and tools of sculpture. Prerequisite: ART 121. Lab 6. Cr 3.

**ART 233 Basic Painting I**

Exploration of various painting concepts. Stress on composition, color, technical mastery of media, and creative imagination. Prerequisite: ART 102, ART 111. Lab 6. Cr 3.

**ART 234 Basic Painting II**

Exploration of various painting concepts stress on composition, color technical mastery of media, and creative imagination. Prerequisite: ART 233. Lab 6. Cr 3.

**ART 241 Introduction to Printmaking**

The fundamentals of intaglio and lithographic printing will be discussed, analyzed and investigated through studio experiences. Emphasis will be on mastery of technical, aesthetic and expressive elements. Prerequisite: ART 102, ART 111. Lab 6. Cr 3.

**ART 242 Intermediate Printmaking I**

Study of intermediate studio techniques in intaglio and lithography through creative pro-

duction. Emphasis is on technical and conceptual advancement. Concentration in either intaglio or lithography (student's choice). Prerequisite: ART 241. Lab 6. Cr 3.

**ART 281 Art Materials and Techniques**

Materials, methods, and techniques for the professional artist-craftsman. Examination, comparison, and testing of materials and processes of painting, graphics, sculpture, etc. Prerequisite: ART 102 or permission. Primarily for art majors. Lec 2, Lab 1. Cr 3.

**ART 282 Introduction to Filmmaking I**

Elementary techniques of filmmaking as an expressive art form. Study of the camera and its function, lighting, editing, composition, sound, and film continuity and structure. Stress on the aesthetics of film through study of some outstanding examples of past and present classics. (Student must pay cost of film and processing; other equipment supplied.) Permission. Lab 6. Cr 3.

**ART 283 Introduction to Filmmaking II**

Elementary techniques of filmmaking as an expressive art form. Study of the camera and its function, lighting, editing, composition, sounds, and film continuity and structure. Stress on the aesthetics of film through study of some outstanding examples of past and present classics. (Student must pay cost of film and processing; other equipment supplied.) Permission. Lab 6. Cr 3.

**ART 321 Advanced Studio Problems in Sculpture I**

Advanced, guided study, for the student who has completed introductory and secondary level courses in a 3-D media. Special problems in technique and creative production. Understanding interdependency of thought and material in artistic expression. Prerequisite: ART 221. Lab 6. Cr 3.

**ART 333 Advanced Studio Problems in Painting**

Advanced, guided study for the student who has completed introductory and secondary level courses in painting. Special problems in technique and creative production. Understanding interdependency of thought and material in artistic expression. Prerequisite: ART 234. Lab 6. Cr 3.

**ART 341 Intermediate Printmaking II**

Study of intermediate studio techniques in either intaglio or lithography (student's choice) through creative production. Considerable em-

phasis is on technical and conceptual advancement. Prerequisite: ART 241. Lab 6. Cr 3.

**ART 342 Advanced Printmaking**

Study of advanced studio techniques in various printing media. Stress is on mastery of technical, aesthetic, and expressive elements. Prerequisite: ART 242. Lab 6. Cr 3.

**ART 397 Independent Study in Art**

Advanced independent study or research projects in art and related areas. Prerequisite: Juniors and seniors only, and permission of the instructor. Cr Ar.

**ART 398 Directed Study in Art**

Advanced independent study of research projects in art and related areas. Cr Ar.

**ART 496 Field Experience in Art**

Students engaged in professional activities related to their academic major area of study may apply for supervision and credit for the project. Prerequisite: Seniors and/or permission. Cr Ar.

**ART 497 Independent Study in Studio Art**

Advanced studio tutorial in painting, sculpture, printmaking, or related areas. Independent studio research on problems designed by the student. Prerequisite: Permission only. Cr Ar.

**ART 498 Directed Study in Studio Art**

Advanced studio tutorial in painting, or related areas. Independent studio research on problems designed by the student. Prerequisite: Permission only. Cr Ar.

**Courses in Art Education**

**AED 171 The Teaching of Art**

Current approaches, methods and materials for the teaching of art in the elementary grades. Art Education theory and curricula taught in conjunction with general art knowledge and experiences. Junior or senior elementary education majors only; or permission. (Not open to art education majors.) Lec 2, Lab 1. Cr 3.

**AED 271 Teaching Materials for Art Education**

Introduction of educational materials and media for use in art curricula. Exploration of newer media and technologies for art education, including film, video, and computers. Required for art education majors. Open to non-art majors by permission only. Lec 1, Lab 2. Cr 3.



**AED 372 Foundations and Curriculum in Art Education**

Historical, philosophical, psychological, and sociological foundations of art education; critical examination of current research, trends and issues in art education; introduction to art curricula approaches and development; theories of child art; observation of art classes. Art education majors only. Lec 2, Lab 1. Cr 3.

**AED 373 Curriculum and Methods in Art Education**

Exploration, development, and evaluation of curricula and instructional methods in art education; includes instructional planning and practicum experience. Prerequisite: AED 372. Art education majors only. Lec 2, Lab 1. Cr 3.

**AED 375 Art Education Workshop and Laboratory**

Plan of study, projects and credit arranged. Limited to art education majors. Cr Ar.

**AED 496 Field Experience in Art Education**

Students involved in pre-professional activities with art education in schools or community agencies may apply for supervision and credit for the project. Prerequisite: AED 271, AED 372, AED 373 or permission. Cr Ar.

**AED 497 Independent Study in Art Education**

Advanced projects, readings, or seminars in art education. Topic and form of study to be determined by student in consultation with faculty member. Prerequisite: AED 271, AED 372, AED 373 or equivalents and permission. Cr Ar.

**AED 498 Directed Study in Art Education**

Advanced projects, readings, or seminars in art education. Topic and form of study to be determined by student in consultation with faculty member. Prerequisite: AED 271, AED 372, AED 373 or equivalents and permission. Cr Ar.

**AED 574 Topics in Art Education**

Advanced seminar and workshop with research projects in art education and related areas. Specific topic to be announced or arranged. The course may be repeated for credit once if a different topic is treated. Prerequisite: Art teaching experience. Cr 3.

**Courses in Art History****ARH 151 Principles of Two-Dimensional Art**

An analysis of the fundamental premises underlying such two-dimensional art forms as painting, drawing and printmaking. Not an

historical survey, although masterpieces are studied. Lec 3. Cr 3.

**ARH 152 Principles of Three-Dimensional Art**

An analysis of the fundamental premises underlying such three-dimensional art forms as architecture and sculpture. Not an historical survey, although masterpieces are studied. Lec 3. Cr 3.

**ARH 155 Art History I**

Introductory survey of painting, sculpture, architecture, and other arts in their various contexts from the Upper Paleolithic and Ancient World to the end of the Middle Ages. Lec 3. Cr 3.

**ARH 156 Art History II**

Introductory survey of painting, sculpture, architecture, and other arts in their various contexts from the Renaissance to the present. Lec 3. Cr 3.

**ARH 162 Modern Architecture and Design**

A broad survey of modern European and American architecture and design. Historical building systems and decorations are investigated in terms of their relationship to 20th century achievements in building and engineering. The aesthetic and social ideas of structures, spaces and design are stressed. Key monuments, schools, and major figures are focused on in slides, films and lectures. Special emphasis on urban planning and environmental design. Lec 3. Cr 3.

**ARH 168 Canadian Art**

Survey of Canadian art and architecture from the Indian to the 20th century. Emphasis on the major ideas and styles and their relationship to American and European prototypes and analogues. Lec 3. Cr 3.

**ARH 251 Classical Art**

Survey of the art and architecture of Greece and Rome in their historical context since the beginnings of Aegean civilization to the Christianization of the Roman Empire. Prerequisite: ARH 155 or permission. Lec 3. Cr 3.

**ARH 255 Italian Renaissance Art**

Survey of the major works of painting, sculpture and architecture of the Italian Renaissance in their historical context from the 13th century to the early 16th century. Prerequisite: ARH 156 or permission. Lec 3. Cr 3.

**ARH 257 Northern Renaissance Art**

Survey of the art of the Netherlands, France, Spain, and Germany in its historical context

from Late Gothic of the 14th century to Mannerism of the 16th century. Prerequisite: ARH 155 and ARH 156 or permission. Lec 3. Cr 3.

**ARH 261 Nineteenth Century Art**

Survey of painting and sculpture in their context from the late 18th century to the end of the 19th century, from Neoclassicism and Romanticism to Realism, Impressionism and Post-Impressionism. Prerequisite: ARH 156 or permission. Lec 3. Cr 3.

**ARH 262 Modern Art**

An historical and stylistic survey of art forms from the end of the nineteenth century through 1945, from Fauvism and Cubism to Expressionism and Surrealism. Prerequisite: ARH 156 or permission. Lec 3. Cr 3.

**ARH 263 Art Since 1945**

Survey of recent developments in art from mid-century to the present. Prerequisite: ARH 156 or permission. Lec 3. Cr 3.

**ARH 351 Art Theory and Criticism**

Examination and discussion of aesthetic theory and its relationship to the visual arts; study of a wide range of ideas in the development of aesthetic thought with primary emphasis on contemporary theory; application of theoretical systems in the critical analysis of a work of art. Prerequisite: ARH 155 and ARH 156 or permission. Lec 3. Cr 3.

**ARH 352 Materials and Methods in Art History**

Review and discussion of the bibliography, methods and materials of art history; and application of various methods in individual and group projects. Prerequisite: ARH 155 and ARH 156 or permission. Lec 3. Cr 3.

**ARH 361 Topics in Art History**

Survey of a particular culture, period, artists or artist, or of particular issues in the history of art. Specific topic to be announced. It will vary from semester to semester depending on special interest of faculty member teaching it. The course may be repeated for credit if a different topic is treated. Lec 3. Cr 3.

**ARH 397 Independent Study in Art History**

Advanced independent study or research and writing projects in the history of art and related areas. Prerequisite: Juniors and seniors only, and permission. Cr Ar.

**ARH 398 Directed Study in Art History**

Advanced independent study or research and writing projects in the history of art and related areas. Prerequisite: Juniors and seniors only, and permission. Cr Ar.

**ARH 496 Field Experience in Art History**

Students engaged in professional activities related to their academic major area of study may apply for supervision and credit for the project. Prerequisite: Juniors and seniors only and permission. Cr Ar.

**ARH 497 Independent Study in Art History**

Advanced independent study or research and writing projects in the history of art and related areas. Prerequisite: Juniors and seniors only and permission. Cr Ar.

**ARH 498 Directed Study in Art History**

Advanced directed study or research and writing projects in the history of art and related areas. Prerequisite: Juniors and seniors only, and permission. Cr Ar.

## English

Associate Professor Burnes (Chairperson); Professors Bennett, Hatlen, Urbanski; Associate Professors Bauschatz, Brinkley, Brogunier, Brucher, Donovan, Evans, Hunting, Jacobs, Kail, MacKnight, Nees-Hatlen, Wicks, J. Wilson; Assistant Professors Cowan, Everman, Ford, Mahala, Mooney, Norris, Rauch, Rogers, Spilka; Instructors Callaway, Hakola, M. Wilson; Lecturer Pollet; Cooperating Lecturer Whelan

The Department of English offers a variety of courses in literature and writing, as well as

specialized courses dealing with language and teaching. The skills these courses develop include reasoning, logical analysis, and persuasive communication, as well as an understanding of literary forms and literary and cultural history. An English major may go on to such fields as teaching, publishing, or journalism, and English is also a valuable pre-professional major for such diverse fields as law, business, and federal service. English is very attractive as a double major, too, as communication skills are important in all other disciplines.

English majors may choose a regular literature program or may elect a program in creative writing, expository writing or technical writing. The requirements for the English major are outlined below:

### Regular Major

1. Writing courses (exclusive of ENG 101) including ENG 301 (for regular majors only)	6
2. Introduction to Literary Study (ENG 220)	3
3. A year-long survey of American (ENG 241/242), British (ENG 251/252), or World (ENG 231/232) Literature	6
4. English courses at the 400-level or above (exclusive of writing courses)	18
5. At least three additional hours	3
<b>TOTAL CREDITS</b>	<b>36</b>

### Concentration in Writing

1. Writing courses (exclusive of ENG 101) (see item 5 under additional requirements)	12
2. Introduction to Literary Study (ENG 220)	3
3. A year-long survey of American (ENG 241/242), British (ENG 251/252), or World (ENG 231/232) Literature	6
4. English courses at the 400-level or above (exclusive of writing courses)	15
<b>TOTAL CREDITS</b>	<b>36</b>

### Additional Requirements and Considerations:

1. The major requires a minimum of 36 hours in English. Students may, however, take up to 48 hours of ENG courses.
2. The major requires proficiency in a foreign language at the intermediate level. Normally, "intermediate proficiency" means the equivalent of four semesters of college work.
3. To satisfy the Junior-level writing proficiency requirement, all majors must place in their student file two papers from courses, with statements from instructors of these courses certifying that these papers meet the Junior-level proficiency requirement.
4. Courses in language and linguistics with INT designation may count as ENG courses
5. Majors in the Concentration in Writing may chose a creative writing track, a technical writing track, or an expository writing track. Creative writing students should take either ENG 205 or 206, ENG 307 or 308, ENG 405 and at least three additional credits of writing. Technical writing students should take ENG 317, 417, and 496, plus at least three additional credits of writing. Expository writing students should take ENG 212, 301, and 401, plus at least three additional credits of writing. Because ENG 405 may be repeated for credit, many students take a second semester of this course to fulfill the requirement for three additional credits of writing.
6. Majors in the creative writing track submit a full-length manuscript as part of their graduation requirements.

## A typical four-year program in English

### Freshman Year

#### Regular Major

ENG 101 and one or two other lower-level ENG course(s). Prospective English majors are especially encouraged to take ENG 129, which is normally limited to Freshmen.

#### Concentration in Writing

ENG 101 and one or two other lower-level ENG course(s). Prospective English majors are especially encouraged to take ENG 129, which is normally limited to Freshmen.

### Sophomore Year

#### Regular Major

1. The year-long survey: ENG 231 and ENG 232, or ENG 241 and ENG 242, or ENG 251 and ENG 252.
2. ENG 220 either fall or spring semester.
3. ENG 212 (Intermediate Composition).

#### Concentration in Writing

1. The year-long survey: ENG 231 and ENG 232, or ENG 241 and ENG 242, or ENG 251 and ENG 252.
2. ENG 220 either fall or spring semester.
3. ENG 212 (for students in the expository writing track); ENG 205 or 206 (for students in the creative writing track).

Junior Year	
Regular Major	Concentration in Writing
<hr/> <hr/> Three to four 400-level English courses.	<hr/> <hr/> 1. ENG 307 and /or ENG 308 (for students in the Creative Writing track); ENG 317 and 417 (for students in the Technical Writing track); ENG 301 (for students in the Expository Writing track). 2. Two to three 400-level English courses, exclusive of writing courses.
Senior Year	
Regular Major	Concentration in Writing
<hr/> <hr/> 1. Three to four 400-level English courses. 2. ENG 301 (Advanced Composition).	<hr/> <hr/> 1. ENG 405 (for students in the Creative Writing track); ENG 496 (for students in the Technical Writing track); ENG 401 (for students in the Expository Writing track). 2. Two to three 400-level English courses, exclusive of writing courses.

## Graduate Study

The Department of English offers the Master of Arts degree in English. Candidates for this degree may choose a concentration in composition, a concentration in creative writing, or a literature concentration. Creative writing students must take 9 hours of course work in writing courses and 15 hours of course work in literature, and must complete a creative thesis for which they normally receive 6 hours of thesis credit. Students in the literature concentration may choose either a thesis program of 30 hours (24 in course work and six of thesis) or a non-thesis program of not less than 30 hours of course work. Students in the concentration in composition must take 24 hours of course work in literature and 6 hours of course work in rhetorical theory and the teaching of writing. For further details, see the Graduate School Catalog.

## Placement in Writing Courses

Satisfactory performance on a one-hour placement examination in writing is required for all students registering in ENG 101, College Composition. All entering freshmen should test during New Student Orientation. Students whose test results indicate readiness for ENG 101 should register for a division of ENG 101 in the appropriate semester. Some students may earn credit-by-examination for ENG 101 through the test and will be so informed by their academic advisors at registration. Students whose examinations indicate that they do not meet minimum entrance standards for ENG 101 will be required to enroll in ENG 001,

The Writer's Workshop, at the first opportunity; this course is a prerequisite for enrollment in ENG 101 for such students and does not carry graduation credit, although it does provide 3 semester credit hours.

## Courses in English

### ENG 001 Writing Workshop

The Writing Workshop is a course for students who need to develop and to practice the basic writing habits necessary for successful university-level writing. The course is taught largely on an individual basis in the English department's writing center. Students will be selected on the basis of a written diagnostic essay or on the recommendation of faculty members. See the paragraph "Placement in Writing Courses" above. Successful completion of the course will qualify the students for enrollment in ENG 101. 3 semester credit hours (do not count towards graduation). (Pass/Fail Grade Only). **Cr 3.**

### ENG 101 College Composition

An introductory course in college writing in which students practice the ways in which writing serves to expand, clarify, and order experience and knowledge. Particular attention is given to analytic and persuasive writing. Satisfactory completion of the course depends upon quality of weekly writing assignments as well as demonstration of proficiency in college-level writing. See the paragraph "Placement in Writing Courses" above. **Cr 3.**

### ENG 102 College Composition, Advanced

An honors course in college writing in which students learn through practice the principles of analytic and persuasive writing. Entrance by

placement essay only: See the paragraph "Placement in Writing Courses" above. This course may be taken instead of ENG 101.

Cr 3.

### **ENG 120 Introduction to Language and Literature**

The role of language and literature in human consciousness and action. Students learn the basic elements of expressive and persuasive discourse by reading fiction, and by writing imitations and analyses of works studied. ENG 120 may be taken before or after ENG 101.

Cr 3.

### **ENG 121 Introduction to the Drama**

Close reading and analysis of about a dozen to fifteen masterpieces of the drama. Prerequisites: open to freshmen; no senior Arts and Science English majors; ENG 101 is strongly recommended, though not a prerequisite.

Cr 3.

### **ENG 122 Introduction to Poetry**

Close reading and analysis of the various kinds of poetry (lyric, narrative, elegiac, occasional; the sonnet, the ode, the epic; etc.) and an examination of the techniques (rhythm, pattern, sound, tone, imagery, metaphor, allusion, for example) used by poets of note. Prerequisite: open to freshmen; no Arts and Science Senior English majors; ENG 101 is strongly recommended, though not a prerequisite.

Cr 3.

### **ENG 123 Introduction to Fiction**

Close reading and analysis of selected short stories, novellas, and novels. By considering the elements of fiction such as theme, character, plot, image, and point of view, students increase their ability to understand and appreciate the art of fiction. Prerequisites: open to freshmen; no Arts and Science senior English majors; ENG 101 is strongly recommended, though not a prerequisite.

Cr 3.

### **ENG 124 Introduction to Non-Fictional Prose**

Extended practice in reading, reacting to, analyzing, evaluating, and imitating a variety of non-fictional forms, such as essays, biographies, and autobiographies. Students write at least 4,000 words over the semester. Prerequisite: ENG 101 or ENG 129.

Cr 3.

### **ENG 129 Freshman Seminar in English**

An intensive study of texts that have been selected to focus on a common theme. Specific topics will vary from semester to semester. Special attention will be given to strategies for reading and writing about literary works. Prerequisites: Freshmen Only. Exemption from

ENG 101 (College Composition) or permission of the instructor.

Cr 3.

### **ENG 205 An Introduction to Creative Writing**

An introductory course in creative writing, offering students experience in writing in three major forms: autobiographical narrative, fiction, and poetry. Prerequisite: ENG 101 or equivalent.

Cr 3.

### **ENG 206 Descriptive and Narrative Writing**

A course in the writing of descriptive and narrative prose with special emphasis on the informal, autobiographical essay. Prerequisite: ENG 101 or equivalent.

Cr 3.

### **ENG 212 Intermediate Composition**

An intermediate course in composition for students wanting practice in those forms of expository, analytical, and persuasive prose required in the writing of essay test questions, term papers, research projects, and extended arguments. Ordinarily students will be encouraged to write on topics from their own disciplines. Prerequisites: ENG 101 and at least sophomore standing.

Cr 3.

### **ENG 220 Introduction to Literary Study**

An introduction to the close reading of literature. Students write frequently, exploring how conventions of genre, form, and style work in literature. Required of English majors. Prerequisites: ENG 101 and at least sophomore standing.

Cr 3.

### **ENG 229 Topics in Literature**

Topics are announced well in advance when the course is to be offered. Recent topics have included: science fiction, utopian fiction, literature and the law, literature of the third world and literature of the Vietnam war. Prerequisite: 3 hours of literature or permission.

Cr 3.

### **ENG 231 Western Tradition in Literature: Homer Through the Renaissance**

Survey of the major writers in the Western literary tradition. The development of our cultural heritage and the evolution of major literary forms. Recommended for English majors. (This course is identical with FOL 231.)

Cr 3.

### **ENG 232 Western Tradition in Literature: Enlightenment to 20th Century**

Survey of the major writers in the Western literary tradition. The development of our cultural heritage and the evolution of major literary forms. Recommended for English majors. (This course is identical with FOL 232.)

Cr 3.

**ENG 235 Literature and the Modern World**

An examination of the modern sensibility as it has manifested itself in literature. Some attention also to the history of the 20th century and to the music, visual arts, social thought, and science of the contemporary epoch. Prerequisite: ENG 101 is strongly recommended.

Cr 3.

**ENG 236 Canadian Literature**

An examination of the development of Canadian literature from 1850 to the present. Interpretation and analysis of the poetry and prose of major literary figures. Some examination of the impact of British and American models upon the tradition of Canadian literature. Prerequisite: 3 hours of literature. Cr 3.

**ENG 241 American Literature Survey: Beginnings Through Romanticism**

The major themes, ideas, attitudes and techniques which have developed in our national poetry, fiction, drama, and essay and which have defined them as particularly American. Recommended for English majors. Prerequisite: 3 hours of literature or permission.

Cr 3.

**ENG 242 American Literature Survey: Realism to The Present**

The major themes, ideas, attitudes and techniques which have developed in our national poetry, fiction, drama, and essay and which have defined them as particularly American. Recommended for English majors. Prerequisite: 3 hours of literature or permission.

Cr 3.

**ENG 244 Writers of Maine**

The Maine scene and Maine people as presented by Sarah Orne Jewett, E. A. Robinson, Edna St. Vincent Millay, Mary Ellen Chase, R. P. T. Coffin, Kenneth Roberts, E. B. White, and others. Prerequisite: 3 hours of literature or permission.

Cr 3.

**ENG 245 American Short Fiction**

A study of genre, form, and theme in representative works of American short fiction from Irving to the present. Prerequisite: ENG 101 strongly recommended.

Cr 3.

**ENG 246 American Women's Literature**

A survey of the main traditions and writers in American women's literature from the origins to the present. Prerequisite: 3 hours of literature or permission.

Cr 3.

**ENG 251 English Literature Survey: Beginnings Through Neoclassicism**

The major patterns of development within the English literary tradition, with emphasis on the cultural and historical forces which have shaped this tradition. Recommended for English majors. Prerequisite: 3 hours of literature or permission.

Cr 3.

**ENG 252 English Literature Survey: Romanticism to the Present**

The major patterns of development within the English literary tradition, with emphasis on the cultural and historical forces which have shaped this tradition. Recommended for English majors. Prerequisite: 3 hours of literature or permission.

Cr 3.

**ENG 253 Shakespeare: Selected Plays**

A study of ten to twelve plays, selected to represent the range of Shakespeare's achievement as a playwright. Recommended for non-majors. Not open to students who have taken ENG 453. Prerequisite: 3 hours of literature or permission.

Cr 3.

**ENG 256 British Women's Literature**

A survey of British women writers and their traditions from the origins to the present. Prerequisite: 3 hours of literature or permission.

Cr 3.

**ENG 280 Introduction to Film**

A survey of the history of motion pictures and an exploration of the rhetoric of film, designed to give students with no prior film study an integrated approach to understanding the moving image and how it functions. Prerequisite: 3 hours of literature.

Cr 3.

**ENG 300 The Bible as Literature**

An exploration of the literature of the Old and New Testaments as they relate to Western culture. The first half of the semester will cover the primary books of the Old Testament; the second half of the semester will focus on the New Testament. Students will read most of the New and about two-thirds of the Old Testament.

Cr 3.

**ENG 301 Advanced Composition**

A course in exposition and argument that combines a study of rhetorical theory and practice in developing a command of various expository styles. Required of English majors. Prerequisites: ENG 101 and ENG 212 or permission of instructor.

Cr 3.

**ENG 307 Writing Fiction**

A course in the writing of fiction, for students

of demonstrated ability. Prerequisite: ENG 205 or ENG 206 or permission of instructor. **Cr 3.**

### **ENG 308 Writing Poetry**

A course in the writing of poetry, for students of demonstrated ability. Prerequisite: ENG 205 or ENG 206 or permission of instructor. **Cr 3.**

### **ENG 317 Technical Writing**

Supervised practice in the writing of technical and business reports, professional correspondence, and related materials. Prerequisites: ENG 101 or equivalent and junior or senior standing. Not recommended for graduate credit. **Cr 3.**

### **ENG 395 English Internship**

An advanced course in writing and in tutoring writing. Students first experience collaborative work in essay writing, critical reading of peers' essays, and rigorous practice in written and oral criticism. The second phase of the course involves supervised tutoring in the English Department's writing center. Prerequisite: ENG 101 or equivalent and at least one other writing course (ENG 212, ENG 205, ENG 206, ENG 301, ENG 317), a recommendation from a UM faculty member, and submission of a writing sample. Not recommended for graduate credit. **Cr 3.**

### **ENG 401 Topics in Writing**

Special topics in expository writing for advanced undergraduate and graduate students. Prerequisite: A 300-level writing course or permission. **Cr 3.**

### **ENG 405 Directed Writing**

Supervised practice in the writing of the novel, drama, short story, poetry, essay, literary criticism, technical or professional writing. Individual projects for students with demonstrated ability, usually seniors concentrating in writing. Admission by permission of instructor only. May be repeated for credit up to 9 credit hours. **Cr 3.**

### **ENG 417 Technical Writing and Editing**

Offers students advanced experience applying the principles of editing and writing such documents as instruction manuals, brochures, proposals, for analyzing, revising, and editing samples of student and professional writing, with special emphasis on style, organization, graphics, and formats. Written work includes editing exercises, group writing projects, and an independent project that defines and solves a communication problem faced by an on-or off-campus organization. Prerequisites: 6 cred-

its in writing beyond ENG 101 (including ENG 317) and permission of instructor. **Cr 3.**

### **ENG 429 Topics in Literature**

Topics are announced well in advance when the course is offered. Recent topics have included Virginia Woolf and the Bloomsbury Group, Tolkien and Modern Fantasy, and Black Women Writers. Prerequisite: 6 hours of literature or permission. **Cr 3.**

### **ENG 430 Studies in European Literature**

Varies in content from generic studies (the novel, the drama) to period studies (the Renaissance, Neo-Classicism). Prerequisite: 6 hours of literature or permission. (This course is identical with FOL 430.) **Cr 3.**

### **ENG 436 Topics in Canadian Literature**

An intensive study of a major Canadian writer or a small group of Canadian writers, or an examination of a major theme in Canadian literature. The specific topic will vary from semester to semester. Prerequisite: 6 hours of literature or permission. **Cr 3.**

### **ENG 443 The American Romantics**

Major works of such early and mid-19th century writers as Irving, Cooper, Emerson, Fuller, Thoreau, Whitman, Poe, Hawthorne, and Melville. Prerequisite: 6 hours of literature or permission. **Cr 3.**

### **ENG 445 The American Novel**

Readings from the major American novelists: Stowe, Melville, James, Twain, Dreiser, Wharton, Hemingway, Fitzgerald, Cather and Faulkner, among others. Focus on thematic, technical, and narrative developments in the American novel, with attention to its portrayal of the emergent national culture and character, in the 19th century, and in the 20th, to its transnational breadth and contributions to major Western literature. Prerequisite: 6 hours of literature or permission. **Cr 3.**

### **ENG 446 American Poetry**

Readings from the major American poets. One third of the course is devoted to the 19th century and earlier. The last two thirds covers the 20th century: Robinson, Frost, Pound, Eliot, Williams, H. D., Moore, Stevens, H. Crane, and selected contemporary poets. Prerequisite: 6 hours of literature or permission. **Cr 3.**

### **ENG 447 American Drama**

A study of 20th Century American dramatists, including O'Neill, Hellman, Williams, Miller,

Albee, Shepard, Mamet, and Henley. Prerequisite: 6 hours of literature or permission.

Cr 3.

#### **ENG 448 Major American Writers**

This course enables the student to study in depth some major American writer or writers, from the 18th century to the present. Depending on the professor and the semester offered, the class will study from one to three major American novelists, poets, or dramatists for their achievements in and contributions to literature. May be repeated for credit when writers differ. Prerequisite: 6 hours of literature or permission.

Cr 3.

#### **ENG 451 Chaucer and Medieval Literature**

Readings from Chaucer, with particular focus on *The Canterbury Tales*. Additional readings from other works, such as Medieval lyrics and romances, among others. Focus on understanding the nature of the Medieval world and how it is expressed in the literature of the time. Additional focus on developing reading skill in Middle English. Prerequisite: 6 hours of literature or permission.

Cr 3.

#### **ENG 453 The Works of Shakespeare**

Readings in the plays of Shakespeare, with some additional attention to his sonnets and narrative poems. Prerequisite: 6 hours of literature or permission.

Cr 3.

#### **ENG 454 Elizabethan and Seventeenth Century Lyric and Narrative Poetry**

Readings in the lyric and narrative poets, with particular emphasis on the Elizabethan sonnet, the erotic and religious verse of Donne, the narrative poetry of Spenser and Milton, and the metaphysical and Cavalier poetry of the 17th century. Prerequisite: 6 hours of literature or permission.

Cr 3.

#### **ENG 455 Eighteenth-Century Fiction, Satire, and Poetry**

Readings from the major 18th century prose writers, such as Defoe, Richardson, Fielding, Sterne, Smollett, Burney, Addison, Steele, Boswell, Johnson and Goldsmith; the poets and satirists, Dryden, Swift, Pope and Gray, among others. Focus on the legitimation of emotion and of individualism in literature. Prerequisite: 6 hours of literature or permission.

Cr 3.

#### **ENG 456 The English Romantics**

The works of the major Romantic poets including Blake, Coleridge, Wordsworth, Byron, Shelly, and Keats, with some attention to their critical writing. Focus on close reading of texts as well as on developing a sense of the histori-

cal and intellectual context of Romanticism. Prerequisite: 6 hours of literature or permission.

Cr 3.

#### **ENG 457 Nineteenth-Century Fiction, Poetry and Essay**

Readings from the major 19th-century British novelists, such as E. Bronte, Dickens, Thackeray, and Hardy; the major poets, such as Tennyson, Browning, Arnold, and Yeats; the major essayists, such as Carlyle, Mill, Newman, and Pater. Focus on the major literary and intellectual issues from Romanticism to the 20th century. Prerequisite: 6 hours of literature or permission.

Cr 3.

#### **ENG 458 Twentieth Century British Literature**

Reading and discussion of such great 20th century writers as Yeats, Joyce, Conrad, Auden, Beckett, Woolf, and Pinter. Prerequisite: 6 hours of literature or permission.

Cr 3.

#### **ENG 465 The English Novel**

Readings from the major English novelists: Defoe, Richardson, Fielding, Austen, The Brontes, Gaskell, Eliot, Dickens, and Hardy, among others. Focus on the development of the genre, its characteristic themes and methods, from "low entertainment" to respectable art form. Prerequisite: 6 hours of literature or permission.

Cr 3.

#### **ENG 467 British Drama**

Readings in the major British dramatists, such as Marlowe, Jonson, Middleton, Webster, Congreve, Sheridan, Wilde, Shaw, Synge, Beckett, and Stoppard. Focus on Renaissance tragedy, Restoration comedy, and modern absurdist drama with some attention to the historical/generic shifts from tragedy to melodrama and from comedy to farce and tragic farce. Prerequisite: 6 hours of literature or permission.

Cr 3.

#### **ENG 468 Major British Authors**

This course offers in-depth study of major British authors. Depending on the semester and the professor, the class will study from one to three major poets, novelists, or dramatists. May be repeated for credit when the authors differ. Prerequisite: 6 hours of literature or permission.

Cr 3.

#### **ENG 470 Literary Criticism**

Selected readings in literary theory and criticism from Aristotle to the present. Prerequisite: 6 hours of literature or permission. (This course is identical with FOL 473.)

Cr 3.



**ENG 471 Feminist Critical Theory**

An examination of the major theoretical tendencies in contemporary feminist criticism, stressing connections with Marxist criticism, Freudianism, existentialism, and poststructuralism. A section on feminist aesthetics will also be included. Prerequisite: Six hours of literature; ENG 246 or ENG 256 recommended.

Cr 3.

**ENG 472 The Teaching of English in the Secondary School**

Principles and practices in the teaching of literature, language, and composition. Prerequisite: 15 hours of literature. INT 310 recommended.

Cr 3.

**ENG 473 The Teaching of Composition in the Secondary School**

A discussion of principles and practices of teaching composition in the high school. Attention to be given to current trends and problems in student writing, and to traditional and new methods of dealing with them. Composition to be considered an integral part of the student's experience, not just in the English classroom.

Cr 3.

**ENG 474 Workshop for Secondary School Teachers of English**

Lectures by staff and eminent specialists in reading, composition, language, and literature. Designed for experienced secondary school English teachers who want to enrich their backgrounds in their subject matter. Enrollment limited to 25 students. Course given in Summer Session only.

Cr 3.

**ENG 476 History of the English Language**

Main aspects of the development of Modern English from Old and Middle English; words and their backgrounds; changes in sound, form, and meaning. Prerequisite: INT 310 or equivalent.

Cr 3.

**ENG 477 Modern Grammar**

Generative-transformational grammar of English, with emphasis on syntax and semantics. Attention is given to the relation of a transformational to structural grammar. Prerequisite: INT 310 or equivalent.

Cr 3.

**ENG 480 Topics in Film**

This course affords the opportunity to study film topics at a more advanced level than ENG 280. Course subject matters will vary from year to year and instructor to instructor, but representative topics might include study of a major director(s), of a national cinema, of certain film

genres, of aspects of film theory, or of women in films. Prerequisite: 6 hours of literature.

Cr 3.

**ENG 481 Topics in Women's Literature**

This course will provide advanced study of specific areas of women's literature: for example, Afro-American Women's Literature, Women and the Rise of the Novel, Emily Dickinson, etc. Prerequisite: Six hours of literature; ENG 246 or ENG 256 recommended.

Cr 3.

**ENG 496 Field Experience in English**

Students work with businesses, professions, and other organizations approved by the department. The work in the course varies with each student enrolled and with the needs of the cooperating employer but normally involves either research, public relations, reporting, editing, interviewing, indexing, or other allied activity requiring skill in reading and writing. Prerequisite: 24 hours in English, including ENG 212 or ENG 317 and permission. In special cases, some of the prerequisites can be waived. May be repeated for credit up to 6 credit hours.

Cr 1-6.

**ENG 500 Introduction to Graduate Study of Literature**

Required of but not limited to all first-year graduate students in English. Sustained practice in methods of inquiry, expression, and research essential in literary criticism.

Cr 3.

**ENG 505 Creative Writing Workshop**

Discussion of work in progress by students working under faculty direction on extended literary projects. Limited to the creative writing MA concentration. Others by permission.

Cr 3.

**ENG 529 Studies in Literature**

This course, like ENG 229 and ENG 429, is intended to supplement and allow occasional experiments within the existing curriculum at the 500 level. Course given in Summer Session only.

Cr 3.

**ENG 541 American Literature from Colonial to Romantic**

Specific period or topic studied may vary from year to year, while recognizing that, overall, the period culminates in the poetry and prose of Emerson, Hawthorne, Melville, Thoreau, Fuller, and Whitman.

Cr 3.

**ENG 545 American Realism and Naturalism**

Emphasis on fiction, and especially on the novels of Twain, Howells, James, Crane, Dreiser, and Wharton.

Cr 3.

**ENG 546 Modern American Literature**

A study of significant themes, literary and cultural, and the esthetics of such authors as Frost, Williams, Pound, Eliot, Stein, Moore, Crane, Cather, Fitzgerald, Hemingway, Porter, Dos Passos, Faulkner. **Cr 3.**

**ENG 551 Medieval English Literature**

The major works of the Medieval period, with emphasis on such masterpieces as Beowulf, Sir Gawain and the Green Knight, Piers Plowman, and Chaucer's Troilus and Criseyde. **Cr 3.**

**ENG 553 Shakespeare and His Contemporaries**

Plays by Shakespeare, Jonson, Middleton, Webster, and Ford, among others. To test dramatic effects and critical principles, the course emphasizes revenge tragedy, city comedy, and tragic farce. **Cr 3.**

**ENG 554 Renaissance and 17th-Century Literature**

Readings in the lyric and narrative poetry and in the prose of the period from 1520 to 1660. Special emphasis on Sidney, Spenser, Donne, and Milton. **Cr 3.**

**ENG 555 Literature of the Enlightenment**

The course invites the student to investigate unique features of 18th-century literature: e. g., prose satire, the gothic novel, domestic tragedy, the biography, periodical literature, etc. The topic varies each time the course is given. **Cr 3.**

**ENG 556 English Romanticism**

A survey of the six major romantic poets with attention to the critical writings of the period. **Cr 3.**

**ENG 557 Victorian Literature**

A study of Victorian poetry, prose, and fiction by the major authors: Carlyle, Tennyson, Browning, Dickens, Newman, Ruskin, Morris, Hardy and Yeats. **Cr 3.**

**ENG 558 Modern British Literature**

Readings in such major poets as Hardy, Yeats, Auden, and Dylan Thomas; and such novelists as Conrad, Ford, Forster, Woolf, Joyce, Lawrence and Beckett. **Cr 3.**

**ENG 579 The Theory of Composition**

A course in the form and function of written language, including recent developments in linguistic, psycholinguistic, and rhetorical theory. (This course is identical with SPC 579). **Cr 3.**

**ENG 593 Workshop for Humanities Teachers**

Emphasizes critical reading and writing as central to the study of literature, history and art. Introduces theory and approaches to humanities study by engaging participants in studying a specific historical period. Students plan teaching units with full rationales or complete research necessary for curricular revision. Offered CED/Summer Session only. May be repeated for credit. **Cr 3.**

## Foreign Languages and Classics

Professor Small (Chairperson); Professors Delphendahl, Rioux, Roggenbauer; Associate Professors Bauschatz, Del Vecchio, L. Luszczynska, R. Luszczynski, March, Slott, Troiano, Zollitsch; Assistant Professors Brimmer, Ekbatani, Hall, Passman, Pelletier, Pyles, Sears; Lecturer Herlan

Several departments at the University of Maine have special language requirements or recommendations for B. A. degree students. Some require successful completion of six credit hours of a foreign language at the intermediate level. Listed below are the departments that require or recommend a foreign language:

*Anthropology:* Intermediate language proficiency strongly recommended.

*Art:* Intermediate level French or German is required for students who major in art history.

*Chemistry:* One year of either French, German, or Russian.

*Computer Science:* The intermediate level of a foreign language is strongly recommended.

*English:* Proficiency at the intermediate level.

*Geology:* Students contemplating graduate work are strongly encouraged to take either French, German, or Russian.

*History:* Students majoring in History are required to demonstrate intermediate level pro-

ficiency in a foreign language through course work or examination.

*Journalism Mass Communication:* Proficiency at the intermediate level.

*Mathematics:* The intermediate level of a foreign language is strongly recommended.

*Music:* Music - One year of a foreign language which can be either the continuation of a language taken in high school or a new language.

*Philosophy:* One year of a foreign language is recommended for the B. A. degree; two years for those going on to graduate study.

*Physics:* One year of a foreign language is recommended for the B. A. degree; two years for those contemplating graduate study.

*Political Science:* At least one year of a modern foreign language beyond the intermediate level for students majoring in international affairs.

*Sociology:* Recommended if considering graduate study.

*Social Work:* Recommended if considering graduate study.

*Speech Communication:* A foreign language may be elected by the student to meet one of the department's outside requirements.

*Zoology:* Proficiency at the intermediate level.

In addition, B. A. degree students may elect to fulfill one or more of their distribution requirements with a foreign language chosen from an approved list.

Students in a B. A. degree program who have presented two years of a high school foreign language for admission will *not* receive credit for an *elementary* course in that particular language unless *five* years have passed between high school graduation and admission to a college or a university. The department recommends that these students take:

A. An intermediate or advanced course in the language studied in high school (credits earned in those courses count towards the advanced course credits in the humanities category)

OR

B. An elementary course in a new language (credits earned here count towards the introductory course credits in the humanities category).

Any language course (except for elementary courses in the student's high school foreign language) can be taken for credit as an elective.

Credits are awarded on a semester basis.

Finding the appropriate level at which to take a language course is essential for success.

During new student orientation, the Foreign Language Placement Examination will be given for purposes of both placement and credit. All incoming B. A. degree students *must* take the Language Placement Examination.

## Credit by Examination

1. If your score on the Placement Examination is sufficiently high (see following table), you will receive three hours of degree credit equivalent to the first semester of the intermediate course.
2. As an incentive to continue your language study, you are eligible to receive an additional three credit hours equivalent to the second semester of the intermediate course by skipping the intermediate course and passing with a grade of "B" or better two semesters of language study beyond the intermediate level. For example, if you were to score 580 on the French examination, you would receive three credits equivalent to FRE 203. You then have the choice of taking FRE 204 or you may skip FRE 204 and take FRE 205 and FRE 209 or 210, or an advanced course. If you complete two courses with a "B" grade or better, then you will receive an additional three credit hours equivalent to FRE 204. *on* If you take FRE 203 or FRE 204 for credit, you cannot receive credit for these courses by examination.
3. If you score extremely high (see table below), you will receive six hours of credit equivalent to the intermediate course. It is highly recommended that you continue to take advanced courses in the language for which you have demonstrated considerable proficiency.

Exam	Score Range	
	3 Hrs. Credit	6 Hrs. Credit
French	550-670	680 and above
German	560-670	680 and above
Latin	560-670	680 and above
Russian	560-690	700 and above
Spanish	550-710	720 and above

For students who score below the level for which credit is given, the examination results will be used to place such a student in the appropriate level course.

If a student does poorly on the examination and wishes to continue in the same language, he or she may take the elementary course for

NO CREDIT, followed by the intermediate course for credit.

Alternatively, he or she may elect to start a new language for credit. CERTIFICATE OF ACHIEVEMENT. The Department of Foreign Languages and Classics awards certificates to students who complete twelve hours of language study beyond the intermediate level with at least a B (=3.00 or better) in all four courses.

## Advanced Placement

The Foreign Languages and Classics Department accepts *Advanced Placement Examinations* in Foreign Language and Literature for degree credit. Scores of four and five on either exam will receive six credits; scores of three receive three credits.

## Majors

Students may major in the following fields: French, German, Spanish, Romance Languages, Modern Languages, Latin and International Affairs.

### A. General Requirements for Majors in Foreign Languages

1. Demonstration of listening comprehension, oral, reading, and writing proficiency (students who have not received at least "B" in FRE 205 or 206, or GER 205 or 206, or SPA 205 or 206 may be required to take a test in language skills), and
2. Demonstration of comprehensive coverage of literature and civilization through successful completion of appropriate course work, and
3. Beyond the intermediate level in French, German, and Spanish: 30 hours.

### B. Special Requirements for Majors in:

*French:* 18 hours of 400 level French courses, three hours of French or French-Canadian Civilization. A three-credit course in the history of a Francophone country, and INT 410 are strongly recommended. HTY 105/106 (History of European Civilization), and/or HTY 422 (Modern France) are highly recommended.

*German:* Introduction to German Literature, GER 211 or 212 (or equivalent), 15 hours of 400 level German courses, and HTY 105/106, (History of European Civilization). HTY 425/326 (History of Germany) is highly recommended.

*Spanish:* 18 hours of 400 level Spanish courses, HTY 105/106 (History of European Civilization) or HTY 447/348 (Latin America) are highly recommended.

*Romance Languages:* A minimum of 30 hours in French and Spanish beyond the intermediate level, at least 24 of which must be in 400 series; a minimum of 12 hours above the intermediate level in each of the two languages must be taken.

*Modern Languages:* A minimum of 30 hours beyond the intermediate level, representing a combination of either a Romance language and German, a Romance language and Russian, or German and Russian. A minimum of 12 hours above the intermediate level must be taken in each of the two languages and at least 18 hours must be in 400 series courses.

*Latin:* A minimum of 24 hours in the subject matter field beyond the intermediate 200 level. LAT 247/248 should be taken in the junior year or earlier, if possible. In addition, majors are required to complete successfully 18 hours in two or more related disciplines in the arts and sciences, including other languages and courses in translation offered by the Department. Students intending to pursue Classical Studies on a graduate level also should take six hours in Greek and CLA 101/102.

## Interdisciplinary Studies

1. B. A. in French (North American option) Students may combine a program of 24 hours in French beyond the intermediate level with 18 hours of related work in three of the following departments:

Anthropology: ANT 422, 357, 380, GEO 350

History: HTY 458, 359, 360, 521

Sociology: SOC 431, 338

CAN 101, Introduction to Canadian Studies

In addition, students are required to take FRE 440 and FRE 256.

2. Linguistics (See interdisciplinary course concentrations in index). Students may combine a program of a minimum of 15 hours distributed as follows:

- A. Core At least one course must be completed in each of the following categories for a minimum total of nine credit hours.

1. Introduction

INT 410 Introduction to Linguistics

2. Language Structure

FOL 453 Phonology

ENG 477 Modern Grammar

3. Language in Context

INT 380 Sociolinguistics

ANT 481 Language and Culture

SPC 380 Language and Speech Development

B. Electives Students may select courses from among the following which, when added to those in the core, will complete the total of 15 credit hours.

- ENG 476 History of English Language  
 ENG 579 Theory of Composition (dual listed as SPC 579)  
 GER 403 History of German Language  
 FRE 442 French Language of North America  
 FRE 499 Applied French Linguistics  
 FRE 500 History of French Language  
 FRE 420 French Phonetics  
 FRE 520 French Linguistics  
 COS 220 Introduction to Computer Science I  
 COS 221 Introduction to Computer Science II  
 COS 301 Programming Languages  
 COS 470 Introduction to Artificial Intelligence  
 MAT 241 Mathematical Logic  
 PHI 260 Philosophy of Language  
 PHI 450/451 Logic I and II  
 PHI 463 Theory of Knowledge  
 PSY 522 Social Development of Children  
 SPC 256 The Social Process of Interpretation  
 SPC 454 Communication Development in Children  
 SPC 405 Women and Communication  
 SPC 483 Anatomy and Physiology of the Speech Mechanism  
 SPC 484 Introduction to Speech Science  
 SPC 585 Children's Language Disorders

The enumeration here is not definitive; new courses, projects, special seminars, or pertinent readings in upper honors courses may be approved for the program.

Note that the three areas of the distribution requirements for the B. A. degree—Humanities and Fine and Performing Arts, Social Sciences, and Natural Sciences and Mathematics—are represented among the courses listed for this concentration. Working toward the latter is therefore compatible with satisfying B. A. distribution requirements.

Although one may fulfill the minimum requirements by taking five courses from Category I and none from Category II, it is expected that students will choose one or more of the elective courses.

## International Affairs in Foreign Languages

Students may combine a program of twenty four hours above the introductory level in French, German, Russian, or Spanish with nine hours in Social Anthropology, and with nine hours each in Economics, History, and Political

Sciences from among courses with an international focus (see Index, International Affairs). Highly recommended is a course in contemporary civilization and geography of the culture whose language is being studied.

## Teacher Preparation

In addition to meeting the major requirements in foreign languages, students desiring certification must complete the following:

1. An advanced grammar course (FRE 400, GER 400, SPA 400, RUS 467)
2. A civilization course (FRE 457, GER 402, SPA 457/458)
3. FOL 466 The Teaching of Foreign Languages
4. EDB 202, EDB 221, EDB 204, SED 400, one methods course, a practicum experience, one curriculum course, a pre-student teaching seminar, student teaching, and in the case of French majors only FRE 420 (French Phonetics). Students also should register with the College of Education as teacher candidates before the end of the sophomore year.

## The Intensive English Institute

The Intensive English Institute (IEI) at the University of Maine is housed in the Department of Foreign Languages. It is designed to meet the needs of the following:

1. Matriculated University of Maine students who need to improve certain English language skill areas before they begin their academic studies.
2. Students who plan to study at the University of Maine, or at another college or university.
3. International students who come to America to study English.

The IEI provides intensive instruction in the skills of listening, speaking, reading, and writing. The student receives a minimum of 20 hours of instruction in the core courses, in addition to five hours of special topics such as video films, TOEFL preparation classes, word processing, language laboratory activities, media, pronunciation and sustained reading. The approach in the program is personalized and innovative.

The academic staff at IEI is experienced and enthusiastic. They have graduate degrees in ESL or related fields.

For further information regarding the Intensive English Institute, contact Glayol Ekbatani,

Director, Intensive English Institute, 158 Little Hall.

## Study Abroad

Students majoring in a foreign language are encouraged to spend a summer, a semester, or an academic year in a previously approved program of study at a foreign University as a part of their program. Consult the Chair of the department regarding these possibilities. The Foreign Language Department, in cooperation with the Canadian-American Center, sends students in the Canada Year Program from Orono to Canadian universities. In past years, UM students have attended McGill, l'Université Laval, l'Université du Québec and other schools in Canada. Interested candidates should apply to Canada Year, Canadian-American Center, 160 College Avenue.

The Department of Foreign Languages and Classics offers a number of core courses in the Canadian Studies Program, which is an interdisciplinary concentration for undergraduates. These courses examine the literature, culture, and civilization of French Canada. The specific listings appear in the French section below.

The University is administering for the Land Grant Universities of New England a Junior Year Abroad Program in Salzburg, Austria; it is affiliated through CIEE (Council of International Education Exchange) with a year or semester abroad study program at Rennes, France, and Seville and Alicante, Spain.

A credit transfer arrangement exists with the Universities of Avignon, and Aix-en Provence, France, and with the University of Kent in England and a direct exchange of qualified freshmen (second semester) with advanced students is sponsored in several German Gymnasien. Arrangements for studies in Canada, e.g., at the Universities of New Brunswick, Nova Scotia, and Québec, can be made through the Canada Year Program.

Up to 36 credits may be earned through these programs, pending previous consent of the Dean, and the department chair involved.

Total immersion programs in French in Québec, in German and in Spanish are offered during the May Term (FRE, GER, SPA 297); three credits per program.

## Graduate Study

The department also offers work leading to a Master's Degree in French and M. A. T. degrees

in French, German, and Spanish. See the Graduate School catalog, as well as the Summer Session Catalog, for special aspects involved when the degree is on other than full-time basis.

## Courses in Foreign Languages

### Foreign Languages and Classics Offerings in English

The following courses make available in English the literature and civilization of Continental Europe and South America. They are taught by the same faculty who would ordinarily teach them in the national language for majors; in the English format, most of the courses will satisfy humanities requirements for B. A. students and will serve as electives for any other students.

#### CLA 101 Greek Literature in English Translation

A survey of Greek literature. No knowledge of Greek is necessary. No prerequisite required for this course. **Cr 3.**

#### CLA 102 Latin Literature in English Translation.

A survey of Latin literature. No knowledge of Latin is necessary. No prerequisite required for this course. **Cr 3.**

#### FOL 190 Topics in Foreign Languages

**Cr Ar.**

#### FOL 231 Western Tradition in Literature: Homer Through the

Renaissance Survey of the major writers in the Western literary tradition. The development of our cultural heritage and the evolution of major literary forms. Recommended for English majors. (This course is identical with ENG 231).

**Cr 3.**

#### FOL 232 Western Tradition in Literature: Enlightenment to 20th

Century Survey of the major writers in the Western literary tradition. The development of our cultural heritage and the evolution of major literary forms. Recommended for English majors. (This course is identical with ENG 232).

**Cr 3.**

#### FOL 293 Study Abroad

The purpose of this course designation is to permit the granting of foreign language credit for courses taken abroad for which there is no exact University of Maine catalog equivalent. May be repeated for credit. **Cr 1-6.**

**FOL 410 Contemporary French Novel**

Existentialism of the New Novel; selected works in English translation of leading contemporary French novelists. (Does not count for the French major). Cr 3.

**FOL 415 Twentieth Century French Theatre**

Selected works of leading French playwrights of the 20th century in English translation. (Does not count for the French major). Cr 3.

**FOL 417 The Age of Enlightenment**

Readings in English translation of the political, social, and philosophical writings of Montesquieu, Voltaire, Diderot, Rousseau, and other French writers of the 18th century. May be elected by juniors, seniors, and sophomores with permission. (This course may not be used to meet the requirements of a major or the M. A. degree in French). Cr 3.

**FOL 420 Twentieth Century German Literature in English**

An introduction to the recent German writings in the drama, novel, and poetry, with special attention to such authors as Kafka, Mann, Brecht, and Grass. (Does not count for the German major). Cr 3.

**FOL 425 Modern German Theatre in English**

A study of German drama from 19th Century Realism to the present. Reading and discussion of works by Hauptmann, Schnitzler, Kaiser, Brecht, Durrenmatt, Fisch, Grass, Weiss and others. (Does not count for the German major). Cr 3.

**FOL 430 Studies in European Literature**

Varies in content from generic studies (the novel, the drama) to period studies (the Renaissance, Neo-Classicism). Prerequisite: 6 hours of literature or permission. (This course is identical with ENG 430). Cr 3.

**FOL 440 The Contemporary Spanish American Novel in English**

The major works of Julio Cortazar, Carlos Fuentes, Mario Vargas Llosa, Gabriel Garcia Marquez and Jose Lezama Lima, and other representatives of the contemporary experimental Spanish American novel. (Does not count for the Spanish major). Cr 3.

**FOL 445 Cervantes in English**

Don Quixote and other major works of Cervantes in English. Lectures on his life and times. (Does not count for the Spanish major). Cr 3.

**FOL 453 Phonology**

The sound systems and morphophonemics manifested by natural languages are studied within the theoretical framework of transformational grammar. Prerequisite: INT 310 or equivalent. Cr 3.

**FOL 466 The Teaching of Foreign Languages**

Principles and practice of teaching foreign languages. Analysis of current trends and methods. Application of language learning principles to classroom procedures. Theory and practice of language methodologies at different learning levels. Use of audio-visual devices, including closed-circuit television, and other modern media of instruction and demonstration. For students seeking certification in foreign language teaching. Cr 3.

**FOL 473 Literary Criticism**

Selected readings in literary theory and criticism from Aristotle to the present. Prerequisite: 6 hours of literature or permission. (This course is identical with ENG 470). Cr 3.

**FOL 475 Contributions of European Linguistic Groups to the**

American Cultural Heritage The cultural contributions of European language groups to the development of America. The roots of many American traditions, tracing origins of characteristic (place) names and words to early immigrants; investigating ways in which groups or individuals dealt with the new environment in accordance with their own heritage. In order to study documentary evidence a reading knowledge of a foreign language is recommended. Cr 3.

**FOL 480 Introduction to Dante's Divine Comedy**

Dante's Divine Comedy: Introduction to literary structure, theology, cosmology, and philosophy of the work. Cr 3.

**FOL 490 Topics in Foreign Languages.**

The course may be repeated for credit if a different topic is treated. Cr 1-3.

**FOL 493 Study Abroad**

(Foreign course title here.) The purpose of this course designation is to permit the granting of foreign language credit for courses taken abroad for which there is no exact University of Maine catalog equivalent. May be repeated for credit. Cr 1-6.

**FOL 496 Field Work in Foreign Languages**

Supervised work in either the public or the pri-

vate sector which is relevant to the study and use of a foreign language. Requirements include an initial proposal which shows the relevance of the work experience to the student's program in foreign languages and a final report or paper. Credits will be arranged upon acceptance of the proposal. Prerequisites: an appropriate level of fluency as determined by the department. **Cr 1-12.**

**FOL 520 Methodology of Teaching English as a Second Language**

Course designed to prepare student to teach English to speakers of other languages. Emphasis on linguistic theory and language pedagogy, cognitive strategies of language teaching and techniques and procedures of teaching specific skills. Prerequisite: permission. **Cr 3.**

**FOL 521 Seminar in Literary Research Methods**

Literary topics transcending national boundaries will be chosen to provide training in the methods and techniques of literary research for students of French, German, and Spanish literature. **Cr 3.**

**FOL 598 Topics in Foreign Languages. Cr 3.**

**Courses in French**

**FRE 101 Elementary French I**

A systematic study of the basics of the French language. Equal emphasis is placed on developing reading, comprehension, speaking and writing skills. For students with no previous study of French or fewer than two years in high school. **Cr 4.**

**FRE 102 Elementary French II**

A Systematic study of the basics of the French language. Equal emphasis is placed on developing reading, comprehension, speaking and writing skills. For students with no previous study of French or fewer than two year in high school. Prerequisite: FRE 101 or equivalent. **Cr 4.**

**FRE 121 Elementary French (Accelerated) I**

For students with no previous study of French or fewer than two years in high school. This course must be taken in combination with FRE 122 in one semester. A full year's work covered in one semester. **Cr 6.**

**FRE 122 Elementary French (Accelerated) II**

For students with no previous study of French or fewer than two years in high school. This course must be taken in combination with FRE

121 in one semester. A full year's work covered in one semester. **Cr 6.**

**FRE 203 Intermediate French I**

An integrated approach. Reading texts of a literary and/or cultural nature, as well as audio-visual materials, will be employed to strengthen reading, writing and especially speaking and comprehension skills. Also includes a systematic but gradual review of the essentials of French grammar. Prerequisite: FRE 102 or equivalent. **Cr 4.**

**FRE 204 Intermediate French II**

An integrated approach. Reading texts of a literary and/or cultural nature, as well as audio-visual materials, will be employed to strengthen reading, writing and especially speaking and comprehension skills. Also includes a systematic but gradual review of the essentials of French grammar. Prerequisite: FRE 203 or equivalent. **Cr 4.**

**FRE 205 French Conversation and Composition I**

Systematic training in the correct usage of spoken and written French through a broad range of conversational situations and writing topics. **Cr 3.**

**FRE 206 French Conversation and Composition II**

Systematic training in the correct usage of spoken and written French through a broad range of conversational situations and writing topics. Prerequisite: FRE 205 or equivalent. **Cr 3.**

**FRE 207 French Diction**

The pronunciation of French, with some attention also to the rudiments of structure of the language. Primarily a service course for the Departments of Performing Arts and Speech, e. g. , vocalists, actors, radio and television announcers. **Cr 1.**

**FRE 208 French Play Production**

Participation in the acting and production of plays in the foreign language. Prerequisite: permission of the instructor. This course may be repeated for credit another year. **Cr 3.**

**FRE 209 Readings in French Literature I**

For students who wish practice in reading in French. This course also prepares students for literature and civilization courses at the 400 level. Discussion in French. Prerequisite: FRE 204 or the equivalent. **Cr 3.**

**210 Readings in French Literature II**

For students who wish practice in reading in



French. This course also prepares students for literature and civilization courses at the 400 level. Discussion in French. Prerequisite: FRE 204 or the equivalent. **Cr 3.**

**FRE 215 Advanced French Conversation**  
Oral practice for the advanced language student. Course work revolves around the discussion of cultural and intellectual issues, as well as current political and social events, with a view toward increasing idiomatic and abstract vocabulary. Prerequisite: FRE 205 or permission of the instructor. **Cr 3.**

**FRE 223 Intermediate French (Accelerated) I**  
For students who have completed FRE 102 or FRE 121, 122 or the equivalent in high school. This course must be taken in combination with FRE 224 in one semester. A full year's work covered in one semester. **Cr 6.**

**FRE 224 Intermediate French (Accelerated) II**  
For students who have completed FRE 102 or FRE 121, 122 or equivalent in high school. This course must be taken in combination with FRE 223 in one semester. A full year's work covered in one semester. **Cr 6.**

**FRE 254 Popular Culture in French Canada**  
An examination of modern Quebec society through the study of written texts (fiction, magazines, newspapers, etc.) films, video tapes, and audio recordings that reflect "popular" culture as opposed to "high" culture. Prerequisite: FRE 205, FRE 206 or permission. **Cr 3.**

**FRE 256 French Canadian Civilization**  
An introductory course on French Canada which will examine the literature and social history of French Canada, and will attempt to explain the contemporary culture of Quebec. **Cr 3.**

**FRE 297 French May-Term**  
Total Immersion Program. Prerequisite: FRE 204 or permission of instructor. **Cr 3.**

**FRE 400 Advanced French Grammar and Composition**  
Designed to enhance competence in the areas of French grammar, syntax and written expression. An exposition of grammatical and syntactical principles through composition practice. Prerequisite: FRE 205 or FRE 206 or permission of instructor. **Cr 3.**

**FRE 401 Theme et Version**  
Translation from French into English and from

English into French of texts exemplifying various modes of written expression. Prerequisite: FRE 400 or permission of instructor. **Cr 3.**

**FRE 404 Medieval and Renaissance French Literature**  
Origin, formation and development of a national literature as seen through the prose, poetry and theater from the beginnings through the 16th century. **Cr 3.**

**FRE 405 Seventeenth Century French Literature**  
Literary trends in French classicism: Descartes, Pascal, Corneille, Racine, Moliere, La Fontaine, Lafayette. **Cr 3.**

**FRE 406 Eighteenth Century French Literature**  
Readings from the works of Montesquieu, Voltaire, Rousseau, Diderot, etc., with special attention to Enlightenment Thought and to the novel genre. **Cr 3.**

**FRE 407 19th Century French Literature**  
Readings of major 19th century figures, including Chateaubriand, Hugo, Flaubert and Zola, Balzac, Stendhal, Sand, Baudelaire, with particular attention to social and philosophical themes as well as concepts of language. **Cr 3.**

**FRE 408 Twentieth Century French Literature**  
Readings in the novel, in poetry or in theater (content varies). May be taken over for credit, with permission of instructor. **Cr 3.**

**FRE 409 French Critical Methodology**  
Examination of cases of European critical methods from 19th century to present. Special attention to concepts of history and structural method. **Cr 3.**

**FRE 420 French Phonetics**  
A formal study of the French sound system with considerable practice in phonetic transcription. Practical and remedial work in pronunciation. Prerequisite: FRE 204 or the equivalent. **Cr 3.**

**FRE 440 Franco-American Civilization**  
An interdisciplinary study of the French heritage in North America. **Cr 3.**

**FRE 442 French Language of North America**  
A historical, linguistic and socio-linguistic approach to the study of the Franco-Quebecois and the Franco-American languages. Emphasis on the morphology, syntax, vocabulary and phonetic system in order to understand the

present status of the languages. Research in the areas of the spoken and written language. Competencies in reading and oral comprehension of French are recommended. Cr 3.

**FRE 452 The Novel of Quebec**

An examination of the evolution of the novel in Quebec from 1915 to the present: roman de la terre, the urban novel, the new novel. Authors studied will include Hemon, Grignon, Guevremont, Ringuet, Roy, Hebert and Aquin. Prerequisite: FRE 204 or equivalent. Cr 3.

**FRE 456 Seminar in Quebec Studies**

An advanced course which will examine some of the more complex issues which Quebec has had to confront. Student will be expected to conduct some research and to report their findings. Prerequisite: FRE 256 or permission. Cr 3.

**FRE 457 French Civilization**

Readings, discussions, lectures, written and oral reports on varied aspects of contemporary France, its people, attitudes, institutions, and culture. Prerequisite: FRE 204 or the equivalent. Cr 3.

**FRE 460 Black African Literature in French**

Lectures, readings and discussion of representative novelists, dramatists and poets of Black French Africa from 1930 to the present. Prerequisite: A reading knowledge of French and permission of the instructor. Cr 3.

**FRE 490 Topics in French**

Projected course topics in French and French-Canadian literature include: contemporary cinema, surrealism, contemporary French thought, modern French critical theory, semiotics, symbolism, literature of commitment, images of women, women writers. The content of this course will change every semester for credit if a different topic is treated. Cr 1-3.

**FRE 497 Independent Projects I (undergraduate).** Cr 1-3.

**FRE 498 Independent Projects II (undergraduate).** Cr 1-3.

**FRE 499 Applied French Linguistics**

The French sound system, spoken grammar, basic concepts of descriptive and general linguistics. Cr 3.

**FRE 500 History of the French Language**

Study of the evolution of standard and regional French from the earliest times to the present. Cr 3.

**FRE 504 Seminar in Medieval and Renaissance Literature**

History and development of literary ideas expressed through the epic, theater, romance and poetry of the Medieval period. Readings from the major writers of the French Renaissance: Rabelais, Montaigne, DuBellay, Ronsard. Cr 3.

**FRE 505 Seminar in French Classicism**

Aspects, groups, and genres in literature of the 17th century. Special emphasis on Corneille, Descartes, Pascal, Racine and Moliere. Cr 3.

**FRE 506 Seminar in Literature of the Eighteenth Century**

Individual writers, genres, or themes. Special emphasis on Montesquieu, Prevost, Voltaire, Rousseau and Diderot. Cr 3.

**FRE 507 Seminar in Literature of the Nineteenth Century**

Individual writers, genres, or themes. Special emphasis on Hugo, Stendhal, Balzac, Flaubert, Nerval. Cr 3.

**FRE 508 Seminar in the Novel**

Trends and periods in development of the novel and narrative form in France. Content varies from year to year. Course may be repeated for credit. Cr 3.

**FRE 509 Seminar in Poetry**

Movements in French poetry. The genres, groups and trends studied vary year to year. Course may be repeated for credit. Cr 3.

**FRE 510 Seminar in the Theatre**

Content varies year to year. Course may be repeated for credit. Cr 3.

**FRE 512 Contemporary French Political and Social Institutions**

An investigation into political and social institutions which constitute the fabric of contemporary France. Cr 3.

**FRE 513 English-French Translation**

Intensive practice in the art of rendering English thought in French. Prerequisite: FRE 400 or FRE 401 or equivalent. Cr 3.

**FRE 520 French Linguistics**

French phonology and morphology studied from the generative transformational viewpoint and selected areas of French grammar are analyzed. Attention given to historical development of the language in relation to its present structure. Prerequisite: INT 310 or FRE 420 or permission. Cr 3.

**FRE 550 Seminar in French-Canadian Literature and Language**

Lectures, readings and analyses of representative literature of modern French Canada, emphasis on the novel. Attention given to linguistic and cultural patterns, including those affecting New England. Prerequisite: at least one course in French literature or permission.

Cr 3.

**FRE 552 Films, Video Drama and Literature in French Canada**

A study of contemporary films and video dramas of French Canada. The visual dramas will be compared with the literary works from which they evolved. In addition, the cultural impact of these dramas will be studied within the context of current Canadian issues.

Cr 3.

**FRE 591 Individual Authors I** Cr 3.

**FRE 592 Individual Authors II** Cr 3.

**FRE 597 Projects in French I** Cr 3.

**FRE 598 Projects in French II** Cr 3.

**Courses in German****GER 101 Elementary German I**

The basics of the German language. Emphasis on developing reading, comprehension, speaking and writing skills. For students with no previous study of German or fewer than two years in high school.

Cr 4.

**GER 102 Elementary German II**

The basics of the German Language. Emphasis on developing reading, comprehension, speaking and writing skills. For students with no previous study of German of fewer than two years in high school. Prerequisite: GER 101 or equivalent.

Cr 4.

**GER 111 Elementary German I (Individualized Track)**

An individualized approach to learning the basics of German for those with no previous study of the language of fewer than two years of high school German. Students will contract for varying work loads and for credits varying from 1 to 4 per semester. (Completion of 4 credits is required before beginning the next level, GER 112).

Cr 1-4.

**GER 112 Elementary German II (Individualized Track)**

An individualized approach to learning the

basics of German for those with no previous study of the language or fewer than two years of high school German. Students will contract for varying work loads and for credits varying from 1 to 4 per semester. (Completion of 4 credits required before advancing to GER 203). Prerequisite: GER 101 or GER 111 or equivalent.

Cr 1-4.

**GER 121 Elementary German (Accelerated) I**

A systematic study of the basics of the German language. For students with no previous study of German or fewer than two years in high school. This course must be taken in combination with GER 122 in one semester. A full year's work covered in one semester.

Cr 6.

**GER 122 Elementary German (Accelerated) II**

A systematic study of the basics of the German language. For students with no previous study of German of fewer than two years in high school. This course must be taken in combination with GER 121 in one semester. A full year's work covered in one semester.

Cr 6.

**GER 203 Intermediate German I**

An integrated approach. Reading texts as well as various audiovisual materials will be employed to strengthen reading, writing and especially speaking and comprehension skills. The course also includes a systematic, but gradual review of the essentials of German grammar. Prerequisite: GER 102 or equivalent.

Cr 4.

**GER 204 Intermediate German II**

An integrated approach. Reading texts as well as various audiovisual materials will be employed to strengthen reading, writing and especially speaking and comprehension skills. The course also includes a systematic, but gradual review of the essentials of German grammar. Prerequisite: GER 203 or equivalent.

Cr 4.

**GER 205 Practical German I**

A third year conversational language course designed to further develop students' comprehension, speaking and writing skills for everyday use. All classes are conducted in German. Prerequisite: GER 204 or equivalent.

Cr 3.

**GER 206 Practical German II**

A third year conversational language course designed to further develop students' comprehension, speaking and writing skills for everyday use. All classes are conducted in German.

Prerequisite: GER 204 or equivalent. Prerequisite: GER 205 or equivalent. Cr 3.

#### **GER 207 Readings in Scientific German**

For students who have completed GER 203 or equivalent and wish to be able to read scientific articles in German. The second half of the semester will be devoted to individualized readings in the student's special field of interest. Prerequisite: GER 203 or equivalent. Can be taken as an alternate to GER 204; also serves as preparation for meeting graduate school language requirements. Cr 3.

#### **GER 208 German Play Production**

Participation in the acting and production of plays in the German language. This course may be repeated for credit another year. Prerequisite: Permission of the instructor. Cr 1-3.

#### **GER 209 German Diction**

The pronunciation of German, with some attention also to the rudiments of structure of the language. Primarily a service course for the Departments of Theatre/Dance, Music and Speech, e. g. , vocalists, actors, and television announcers. No prerequisites. Cr 1.

#### **GER 210 Business German**

Primarily for students who wish to develop skills in the specialized branch of the German language through reading and some writing of business correspondence, and through practical conversation. Provides enrichment for those working toward degrees in fields (e. g. , International Affairs) where a knowledge of the present social and economic climate of Germany is important. Prerequisite: GER 203 or equivalent. Can be taken instead of GER 204. Will be offered every other year, alternating with GER 207. Cr 3.

#### **GER 212 Introduction to German Literature II**

An introduction to the important periods of German literature from medieval times to the 20th century, with representative readings. Prerequisite: GER 204 or equivalent. Cr 3.

#### **GER 223 Intermediate German (Accelerated) I**

For students who have completed GER 102 or GER 121, GER 122 or the equivalent in high school as determined by a placement test. This course must be taken in combination with GER 224 in one semester. A full year's work covered in one semester. Cr 6.

#### **GER 224 Intermediate German (Accelerated) II**

For students who have completed GER 102 or GER 121, GER 122 or the equivalent in high school as determined by a placement test. This course must be taken in combination with GER 223 in one semester. A full year's work covered in one semester. Cr 3.

#### **GER 297 German May-Term**

A fifteen-day, off-campus total immersion program on Lake Megunticook near Camden, Maine. Prerequisite: Permission of instructor. Cr 3.

#### **GER 311 Readings in German Literature I**

An introduction to German literature and culture. Reading selections are based on contemporary literary texts and current events. This course also prepares students for literature and civilization courses at the 400 level. Prerequisite: GER 204 or equivalent. Cr 3.

#### **GER 400 Advanced German Grammar and Stylistics**

Designed to provide advanced study in German grammar, syntax, and composition, especially for prospective teachers. An exposition of grammatical and syntactical principles through exercises and composition practice. Prerequisites: GER 205, GER 206 or equivalent, or permission of instructor. Cr 3.

#### **GER 401 German Civilization**

Readings, discussions, lectures, oral and written reports on Germany, its people, institutions, and culture to provide the background essential to an understanding of German literature, thought, and artistic expression. Prerequisite: GER 204 or the equivalent. Cr 3.

#### **GER 402 Contemporary Germany**

Political, social and intellectual development of Germany from 1945 to present. A course in modern German Civilization and Landeskunde. Prerequisite: GER 204 or the equivalent. Cr 3.

#### **GER 403 History of the German Language**

A systematic study of the development of the German language from Indoeuropean times to the present. The goal of this course is to put present day German in its linguistic perspective, to make the speaker of modern German more aware of the reasons and origins of specific forms, patterns and usages and to furnish the prospective teacher with a linguistic background in German. Prerequisite: GER 204 or the equivalent. Cr 3.

**GER 405 Enlightenment and "Storm and Stress"**

Masterpieces of prose, drama, poetry, and essays in critical thought from the 18th century. Special emphasis will be given to Lessing, young Goethe, and Schiller. Prerequisite: GER 204. Cr 3.

**GER 406 Goethe**

Readings from selected works of prose, poetry and drama from Goethe's classical period, with lectures on historical background and influence on later German literature. Cr 3.

**GER 407 Schiller**

Selected works of poetry, drama, and critical writings from Schiller's classical period, with lectures on historical background and influence on later German literature. Prerequisite: GER 204. Cr 3.

**GER 408 The Romantic School**

Readings from works of major authors of the Romantic School, including Novalis, Schlegel, Tieck, Wackenroder, Brentano, E. T. A. Hoffmann, and Eichendorff. Prerequisite: GER 204. Cr 3.

**GER 410 German Literature from 1832 to the Turn of the Century**

Readings from representative works of the 19th century realists, with special emphasis on the *Novelle*. Prerequisite: GER 204. Cr 3.

**GER 411 German Literature of the 20th Century I**

Readings and discussions of representative authors of the 20th century. Emphasis will be on literature before 1945. Prerequisite: GER 204. Cr 3.

**GER 412 German Literature of the 20th Century II**

Readings and discussions of representative authors of the 20th century. Focus will be on the development of new techniques in the novel, *Novelle*, and drama in the Germanys, Austria, and Switzerland of the post-war era. Prerequisite: GER 204 or the equivalent. Cr 3.

**GER 490 Topics in German**

Specific topics to be announced. It will vary from semester to semester depending on special interest of faculty member teaching it. The course may be repeated for credit if a different topic is treated. Cr 1-3.

**GER 497 Projects in German I (undergraduate)**

Cr 1-3.

**GER 498 Projects in German II (undergraduate)**

Cr 1-3.

**GER 597 Projects in German I**

Specific projects to be announced. It will vary from semester to semester depending on the needs of the graduate student and the skills of the faculty member. The course may be repeated for credit if a different project is treated. Cr 1-3.

Cr 1-3.

**GER 598 Projects in German II**

Specific projects to be announced. It will vary from semester to semester depending on the needs of the graduate student and the skills of the faculty member. The course may be repeated for credit if a different project is treated. Cr 3.

Cr 3.

**Courses in Greek****GRE 101 Elementary Greek I**

Fundamentals of the Greek language. For students who have had little or no preparation in ancient Greek. Prerequisite: intermediate language skill in another language or permission of the instructor. Cr 4.

Cr 4.

**GRE 102 Elementary Greek II**

Fundamentals of the Greek language. For students who have had little or no preparation in ancient Greek. Prerequisite: intermediate language skill in another language or permission of instructor and GRE 101 or equivalent. Cr 4.

Cr 4.

**GRE 203 Readings in Greek Literature I**

Selections from Xenophon, Plato, and the Tragedians. One prose author and one playwright will be read. Cr 3.

Cr 3.

**GRE 204 Readings in Greek Literature II**

Selected readings from the works of Homer and Hesiod. Cr 3.

Cr 3.

**Courses in Italian****ITA 215 Italian Diction**

The pronunciation of Italian, with some attention to the rudiments of structure of the language. Designed primarily for singers but may also be elected by others. Cr 1.

Cr 1.

**Courses in Latin****LAT 101 Elementary Latin I**

Fundamentals of the Latin language. Cr 4.

Cr 4.

**LAT 102 Elementary Latin II**

Fundamentals of the Latin language. Prerequisite: LAT 101 or equivalent. Cr 4.

**LAT 203 Readings in Latin Literature I**

Selections from Latin prose authors: Cicero, Caesar, the letters of Pliny. Facility in reading through grammatical analysis will be emphasized. Cr 3.

**LAT 204 Readings in Latin Literature II**

Selections from Latin poetry. Meter, scansion and the interpretation of poetry will be emphasized. Prerequisite: LAT 203 or equivalent or permission of instructor. Cr 3.

**LAT 247 Latin Prose Composition and Stylistics I**

Review of grammar and syntax, with particular attention to Cicero and Tacitus. The writing of prose, especially in the style of Cicero. This course, which is required for majors, should be taken in the junior year or earlier, if possible. Prerequisite: LAT 204 or the equivalent or permission of instructor. Cr 3.

**LAT 248 Latin Prose Composition and Stylistic II**

Review of grammar and syntax, with particular attention to Cicero and Tacitus. The writing of prose, especially in the style of Cicero. This course, which is required for majors, should be taken in the junior year or earlier, if possible. Prerequisite: LAT 247 or permission of instructor. Cr 3.

**LAT 451 Roman Comedy: Plautus and Terence**

One play of each dramatist will be read. The source of Roman comedy, its literary features, and influence upon later literature. Given every three years. Cr 3.

**LAT 452 Roman Philosophical Thought**

Selections from Lucretius, *De Rerum Natura*, and Cicero's philosophical essays. The three major philosophical schools: Academic, Stoic, Epicurean, and their influence on Roman thought. Given every three years. Cr 3.

**LAT 453 Poetry of the Republic and Early Empire**

The lyric poetry of Catullus, the Odes of Horace. The origin and development of satire, with selections from the satires of Horace and Juvenal. Given every three years. Cr 3.

**LAT 454 Prose of the Republic and of Early Empire**

Selections from Cicero's letters, Pliny's letters,

and Tacitus' *Annals*. Given every three years. Cr 3.

**LAT 481 Virgil: The Eclogues, Georgics, Aeneid**

The poet's background achievement, and influence upon later literature. Given every three years. Cr 3.

**LAT 482 Medieval Latin**

Introduction to a variety of Latin prose and texts from the Middle Ages. Emphasis will be upon stylistic and thematic continuities with and differences from classical Latin prose and poetry. Given upon sufficient demand. Cr 3.

**LAT 497 Projects in Latin I**

Individual work on a project of the student's selection. Prerequisite: consent of the department head. (maximum: 3 hrs). Cr Ar.

**LAT 498 Projects in Latin II**

Individual work on a project of the student's selection. Prerequisite: consent of the department head. (maximum: 3 hrs). Cr Ar.

**Courses in Russian****RUS 101 Elementary Russian I**

A systematic study of the basics of the Russian language. Equal emphasis is placed on developing reading, comprehension, speaking and writing skills. For students with no previous study of Russian or fewer than two years in high school. Cr 4.

**RUS 102 Elementary Russian II**

A systematic study of the basics of the Russian language. Equal emphasis is placed on developing reading, comprehension, speaking and writing skills. For students with no previous study of Russian or fewer than two years in high school. Prerequisite: RUS 101 or equivalent. Cr 4.

**RUS 121 Elementary Russian-(Accelerated) I**

For students with no previous study of Russian or fewer than two years in high school. This course must be taken in combination with RUS 122 in one semester. A full year's work covered in one semester. Cr 6.

**RUS 122 Elementary Russian (Accelerated) II**

For students with no previous study of Russian or fewer than two years in high school. This course must be taken in combination with RUS 121 in one semester. A full year's work covered in one semester. Cr 6.

**RUS 203 Intermediate Russian I**

An integrated approach. Reading texts as well as various audiovisual materials will be employed to strengthen reading, writing and especially speaking and comprehension skills. The course also includes a systematic, but gradual review of the essentials of Russian grammar. **Cr 4.**

**RUS 204 Intermediate Russian II**

An integrated approach. Reading texts as well as various audiovisual materials will be employed to strengthen reading, writing and especially speaking and comprehension skills. The course also includes a systematic, but gradual review of the essentials of Russian grammar. Prerequisite: RUS 203 or equivalent. **Cr 4.**

**RUS 205 Practical Russian I**

Systematic training in correct pronunciation, intonation and usage, and in vocabulary building, with written and oral practice. Prerequisite: RUS 204 (or the equivalent) and permission of the instructor. This course is conducted entirely in Russian. **Cr 3.**

**RUS 206 Practical Russian II**

Systematic training in correct pronunciation, intonation and usage, and in vocabulary building, with written and oral practice. Prerequisite: RUS 204 (or the equivalent) and permission of the instructor. This course is conducted entirely in Russian. **Cr 3.**

**RUS 223 Intermediate Russian (Accelerated) I**

For students who have completed RUS 102 or RUS 121, RUS 122 or equivalent in high school. This course must be taken in combination with RUS 224 in one semester. A full year's work covered in one semester. **Cr 6.**

**RUS 224 Intermediate Russian (Accelerated) II**

For students who have completed RUS 102 or RUS 121, RUS 122 or equivalent in high school. This course must be taken in combination with RUS 223 in one semester. A full year's work covered in one semester. **Cr 6.**

**Courses in Spanish****SPA 101 Elementary Spanish I**

A systematic study of the basics of the Spanish language. Equal emphasis is placed on developing reading, comprehension, speaking and writing skills. For students with no previous

study of Spanish or fewer than two years in high school. **Cr 4.**

**SPA 102 Elementary Spanish II**

A systematic study of the basics of the Spanish language. Equal emphasis is placed on developing reading, comprehension, speaking and writing skills. For students with no previous study of Spanish or fewer than two year in high school. Prerequisite: SPA 101 or equivalent. **Cr 4.**

**SPA 111 Elementary Spanish I (Individualized Track)**

A systematic study of the basics of the Spanish language. Equal emphasis is placed on developing reading, comprehension, speaking and written skills. For students with no previous study of Spanish or fewer than two years in high school. (Completion of all 4 credits is required before beginning SPA 112). **Cr 1-4.**

**SPA 112 Elementary Spanish II (Individualized Track)**

A systematic study of the basics of the Spanish language. Equal emphasis is placed on developing reading, comprehension, speaking and written skills. For students with no previous study of Spanish or fewer than two years in high school. (Completion of all 4 credits is required before beginning intermediate level). Prerequisite: SPA 111, SPA 101 or equivalent. **Cr 1-4.**

**SPA 121 Elementary Spanish (Accelerated) I**

For students with no previous study of Spanish or fewer than two years in high school. This course must be taken in combination with SPA 122 in one semester. A full year's work covered in one semester. **Cr 6.**

**SPA 122 Elementary Spanish (Accelerated) II**

For students with no previous study of Spanish or fewer than two years in high school. This course must be taken in combination with SPA 121 in one semester. A full year's work covered in one semester. **Cr 6.**

**SPA 203 Intermediate Spanish I**

An integrated approach. Reading texts as well as other materials will be employed to strengthen reading, writing and especially speaking and comprehension skills. The course also includes a systematic, but gradual review of the essentials of Spanish grammar. Prerequisite: SPA 102 or equivalent. **Cr 4.**

**SPA 204 Intermediate Spanish II**

An integrated approach. Reading texts as well

as other materials will be employed to strengthen reading, writing and especially speaking and comprehension skills. The course includes a systematic, but gradual review of the essentials of Spanish grammar. Prerequisite: SPA 203 or equivalent. **Cr 4.**

**SPA 205 Spanish Conversation and Composition I**

A systematic attempt to increase the student's fluency in spoken Spanish and to improve his command of writing through selected vocabulary and grammar exercises, discussions, skits, speeches, and compositions. Classes are conducted in Spanish. Need not be taken in sequence. Prerequisite: SPA 204 or equivalent. **Cr 3.**

**SPA 206 Spanish Conversation and Composition II**

A systematic attempt to increase the student's fluency in spoken Spanish and to improve his command of writing through selected vocabulary and grammar exercises, discussion, skits, speeches, and compositions. Classes are conducted in Spanish. Need not be taken in sequence. Prerequisite: SPA 204, SPA 205 or equivalent. **Cr 3.**

**SPA 213 Intermediate Spanish I (Individualized Track)**

An integrated approach. Reading texts as well as other materials will be employed to strengthen reading, writing and especially speaking and comprehension skills. The course also includes a systematic, but gradual, review of the essentials of Spanish grammar. Prerequisite: SPA 102, SPA 112 or equivalent. (The entire 4 credits must be earned in order to complete the course). **Cr 1-4.**

**SPA 214 Intermediate Spanish II (Individualized Track)**

An integrated approach. Reading texts as well as other materials will be employed to strengthen reading, writing and especially speaking and comprehension skills. The course also includes a systematic, but gradual, review of the essentials of Spanish grammar. Prerequisite: SPA 203, 213 or equivalent. (The entire 4 credits must be earned in order to complete the course). **Cr 1-4.**

**SPA 218 Spanish Play Production**

Participation in the acting and production of plays in Spanish. Course may be repeated for credit another year with permission of the instructor. **Cr 3.**

**SPA 223 Intermediate Spanish (Accelerated)**

**I**

For students who have completed SPA 121, SPA 122 or the equivalent in high school as determined by a placement test. This course must be taken in combination with SPA 224 in one semester. A full year's work covered in one semester. **Cr 6.**

**SPA 224 Intermediate Spanish (Accelerated)**

**II**

For students who have completed SPA 102 or SPA 121, SPA 122 or the equivalent in high school as determined by a placement test. This course must be taken in combination with SPA 223 in one semester. A full year's work covered in one semester. **Cr 6.**

**SPA 297 Spanish (May Term)**

Total Immersion Program. Prerequisite: Permission of instructor. **Cr 3.**

**SPA 307 Readings in Peninsular Literature**

An overview of Peninsular Spanish literature, designed to provide students with practice in reading and analyzing texts of fundamental importance for the country. A selection of genres and periods will be included. May be taken either before or after SPA 308. Prerequisite: SPA 206 or permission of instructor. **Cr 3.**

**SPA 308 Readings in Spanish American Literature**

Readings from the colonial through the contemporary period. The course will emphasize changes in the cultural phenomena, styles, themes and ideological position of texts from the beginnings of Hispanic American literature through romanticism, naturalism, the novel of the land, the "Boom" and avant-garde movements. May be taken before or after SPA 307. Prerequisite: SPA 206 or permission of instructor. **Cr 3.**

**SPA 400 Advanced Spanish Grammar, Composition, and Stylistics**

Designed to provide an adequate foundation in Spanish grammar, syntax, and composition for prospective teachers. Also applied stylistics for those with certain proficiency of expression interested in creative writing. Prerequisite: SPA 205 or SPA 206, SPA 307 or SPA 308 or permission of instructor. **Cr 3.**

**SPA 401 Golden Age**

Masterpieces of poetry and prose from the 16th and 17th centuries. The aim is to give an overview of the period and to refine the student's



critical abilities. Poetry by Garcilaso, Fray Luis, San Juan, Gongora, and Quevedo, etc. Prose readings include Lazarillo de Tormes, Diana, Suenos y discursos, and *Novelas ejemplares* etc. Prerequisite: SPA 307 or SPA 308 or permission of the instructor. Cr 3.

#### **SPA 402 Comedia**

Theater of the 16th and 17th centuries. Authors include Lope de Vega, Tirso de Molina, and Calderon de la Barca. Prerequisite: SPA 307 or SPA 308 or permission of the instructor. Cr 3.

#### **SPA 403 Cervantes**

A careful reading of the Spanish masterpiece, Don Quixote, with class discussions and lectures on its historical background and continuing influence. Prerequisite: SPA 307 or SPA 308 or permission of the instructor. Cr 3.

#### **SPA 405 Spanish Literature of the Nineteenth Century**

The Romantic Movements: between tradition and revolt. The novel from "costumbrismo" to "realismo". Spanish naturalism: a compromise. Prerequisite: SPA 307 or SPA 308 or permission of the instructor. Cr 3.

#### **SPA 406 Spanish Literature of the Twentieth Century**

Selections from the poetry, essays, and novels of the pre and Civil War period focused through readings in the history and thought of the times. Prerequisite: SPA 307 or SPA 308 or permission of the instructor. Cr 3.

#### **SPA 407 Contemporary Spanish Novel**

Experimental Novel of the Twentieth Century. Prerequisite: SPA 307 or SPA 308 or permission of the instructor. Cr 3.

#### **SPA 408 Latin-American Masterpieces**

A selection of key essays, poems, short stories, and novels from the colonial period to the 20th century. Prerequisite: SPA 307 or SPA 308 or permission of the instructor. Cr 3.

#### **SPA 409 Contemporary Latin-American Short Story**

A study of some of the major short story writers from Latin America. Background lectures, reading and analysis, class discussion. Included in this course will be a study of such significant contemporary concerns as: poverty, politics, religion; and such themes as the interplay of fantasy and reality and the relativity of madness. Prerequisite: SPA 307 or SPA 308 or permission of the instructor. Cr 3.

#### **SPA 410 Latin American Novel**

The contemporary novel in Spanish America,

with special attention on the novelists of the BOOM: among them Cortazar, Garcia Marquez, Vargas Llosa and Fuentes. Prerequisite: SPA 307 or SPA 308 or permission of the instructor. Cr 3.

#### **SPA 411 Contemporary Latin American Theater**

A study of some of the major playwrights from Spain and Latin America of the 20th century. Reading and analysis of plays; class discussion. Prerequisite: SPA 307 or SPA 308 or permission of the instructor. Cr 3.

#### **SPA 412 Contemporary Peninsular Theater**

A study of some major playwrights from Spain of the 20th Century. Reading and analysis of plays; class discussion. Prerequisite: SPA 307 or SPA 308 or permission of the instructor. Cr 3.

#### **SPA 413 Hispanic Women Writers**

A critical study of the major literary texts produced by some Spanish and Spanish American women writers since the XVIIth century to the present, both in the field of poetry and of prose. Using a cultural approach, the class will focus on the discourse of these women as it confronts a male oriented and a male controlled field. The specific area of study will be indicated in the schedule of classes pertinent to the semester it is being taught. Prerequisites: SPA 307 or SPA 308, or permission of the instructor. Cr 3.

#### **SPA 425 Medieval Spanish Literature**

Literary masterpieces of the Spanish Middle Ages (12th through 15th centuries). Introduction to the period's literature and refinement of critical skills (both written and spoken) by laying a basis for the historical understanding of the development of genres. Prerequisites: SPA 307 or SPA 308 or permission of instructor. Cr 3.

#### **SPA 457 Spanish Civilization**

Readings, discussions, lectures and written reports on Spain, its people, institutions and culture for the purpose of providing the background essential to an understanding of Spanish literature, thought and artistic expression. Prerequisite: SPA 307 or SPA 308 or permission of the instructor. Cr 3.

#### **SPA 458 Spanish American Civilization**

Readings, discussions, lectures and written reports on Latin America, its people, institutions, and culture for the purpose of providing the background essential to an understanding of Latin America literature, thought and artistic expression. Prerequisite: SPA 307 or SPA 308 or permission of the instructor. Cr 3.

**SPA 490 Topics and Individual Authors in Spanish**

Content of course will change from semester to semester. The course may be repeated for credit if a different topic is treated. Cr 1-3.

**SPA 497 Projects in Spanish I**

Independent study on topics selected by student and instructor. Cr 1-3.

**SPA 498 Projects in Spanish II**

Independent study on topics selected by student and instructor. Cr 1-3.

**SPA 597 Projects in Spanish I**

Specific projects to be announced. It will vary from semester to semester depending on the needs of the graduate student and the skills of the faculty member. The course may be repeated for credit if a different project is treated. Cr 3.

**SPA 598 Projects in Spanish II**

Specific projects to be announced. It will vary from semester to semester depending on the needs of the graduate student and the skills of the faculty member. The course may be repeated for credit if a different project is treated. Cr 3.



## History

Professors Nadelhaft (Chairperson), Babcock, Baker, Blanke, Doty, Schonberger, Smith; Associate Professors Battick, Bregman, Grab, Petrik, Schriver, Segal, TeBrake; Assistant Professors Ferland, Goldstein, Higgins, Judd, Long, Weiner

The Department offers lower level baccalaureate courses (HTY 103-HTY 280), upper level baccalaureate courses (HTY 301-HTY 499), and graduate level courses (HTY 501-HTY 599). Senior history majors may take graduate level courses. Other students may take graduate level courses by permission. Majors must complete at least 12 three-hour courses in history, including:

- A. At least 2 courses at any level from each of the following groups:
  1. United States history
  2. European history
  3. The history of areas outside Europe and the United States or history with either a world-wide or a topical focus.
- B. At least eight intermediate or advanced courses. At least four of these courses must be concentrated in a single geographical, chronological, or topical area. An additional two courses must be grouped into a minor concentration. These must be selected in consultation with the student's history advisor.
- C. At least one senior seminar, normally taken during the student's final undergraduate year.

Students must achieve a 2.0 G. P. A. in their major, pass an English proficiency test, and demonstrate proficiency in a foreign language at the intermediate level either through examination or course work.

The Department offers an emphasis in the international affairs program. See International Affairs in the index.

The department offers the M. A. degree in history, with specialties in most areas of history. In cooperation with the Department of Anthropology, the department also offers a master's program with an emphasis in historical archaeology. The Ph. D. degree is offered in United States History and Canadian-American history. Further details may be found in the Graduate School catalog.

## Courses in History

### HTY 103 United States History I

The historical experience of the American people through the major ideas and forces that have shaped the Republic: The exploration of America through post-Civil War Reconstruction. **Cr 3.**

### HTY 104 United States History II

The historical experience of the American people through the major ideas and forces that have shaped the Republic: the urban-industrial age, liberal political reform, and American world leadership. **Cr 3.**

### HTY 105 History of European Civilization I

Political, economic, social, and intellectual developments in Europe from antiquity to 1715, emphasizing those features which help to explain our present-day civilization. **Cr 3.**

### HTY 106 History of European Civilization II

Political, economic, social, and intellectual developments in Europe from 1715 to the present, emphasizing those features which help to explain our present-day civilization. **Cr 3.**

### HTY 107 East Asian Civilization I

A survey of China's and Japan's social, economic, cultural and political life from pre-historic times to the present. Whenever applicable, Korea and Vietnam will be discussed. Emphasis on key periods in each country, especially changes in the 19th and 20th centuries. **Cr 3.**

### HTY 108 South and Southeast Asia Civilization

A survey of the social, economic, cultural and political life of India and some Southeast Asian countries from prehistoric times to the present. Key periods, especially the 19th and 20th centuries, and main themes will be emphasized. **Cr 3.**

### HTY 109 Introduction to Latin America

The historical experience of the people of Latin America from prior to contact through conquest and colonization, cultural exchange, the social, economic, and political developments following independence in the nineteenth cen-

ture, and the evolving crises of the twentieth century. No prerequisite. Cr 3.

**HTY 111 Canada: From Cartier to Trudeau**

An overview of Canadian history from the age of the 16th century explorers to the contemporary political scene. The emergence of various regional identities and the evolution of the social formation from colonial times to the modern urban era are the central themes examined. No prerequisite. Cr 3.

**HTY 199 Problems in History**

An analysis of a selected controversial or contemporary historical problem. In some cases the topic to be studied and the method of approaching it may be chosen jointly by interested students and an instructor. No prerequisites. Cr 3.

**HTY 201 Classical Civilization**

A basic introduction to the history, culture, art, and thought of the ancient Greeks and Romans, emphasizing those aspects of the classical world which have had an impact on our civilization. Cr 3.

**HTY 202 Medieval Civilization**

Investigation of the cultural development of Europe during the Middle Ages, from late Roman times through the 15th century, developing a broad overview of the distinctively European civilization that emerged during the period. Cr 3.

**HTY 210 History of Maine**

A survey of Maine's social, economic, and political life, from primitive times to the present. After a brief study of Indian life preceding white settlement, the periods of colonial, provincial, and state history are covered. No freshmen. Cr 3.

**HTY 215 The World in the Twentieth Century I**

The response of leaders and ordinary men and women to the events of the first half of the 20th Century: Two World Wars and the Great Depression, competitive ideologies of fascism, communism, and democracy, the first stirrings of Asian, African and Latin American self-determination, and popular culture, technology, and morality in the age of the flapper to the end of World War II. Cr 3.

**HTY 216 The World in the Twentieth Century II**

The response of leaders and ordinary men and women to the world events since World War II: a postwar revolution, a struggle between the

USA and USSR, the rise of Asian, African, Latin American, and Mideast self-determination, and changing popular culture, consumption, morality, and technology from the "baby boomers" to today. Cr 3.

**HTY 217 Environmental History of Europe**

Changes in the basic interrelationships between nature and human culture, emphasizing the gradual evolution of European society within its physical setting from small, isolated groups of primitive agriculturalists in prehistoric times, through the complex peasant society of the Middle Ages, to the emergence of a highly urbanized, industrialized society today. Cr 3.

**HTY 250 History as People: The American Experience as Biography**

An exploration of the American experience from the colonial period to the present. Major facets of American life explored through lectures on the lives and important actions of representative Americans. The premise of this course is that the past is sometimes best understood through its individual people. Cr 3.

**HTY 272 The Industrial Worker in America**

Beginning with the artisan "republic" of the Revolutionary War, this course examines changes in the world of work during successive phases of industrial capitalist development. The focus is upon the evolving factory system, worker responses to technological change, and effects of ethnicity, race, and gender on those responses. The concluding portion emphasizes the growing role of the state in the lives of workers, and examines a variety of contemporary labor issues from an historical perspective. Guest lectures, films, field trip to area factory. Cr 3.

**HTY 276 Sports in the Western World**

A survey of the origins and evolution of competitive sport from the ancient world to the present with emphasis on the relation of sport to changes in technology, political systems, and social values. Cr 3.

**HTY 277 History of the Treatment of the American Environment**

The attitude, policies, and behavior of Americans and their government toward the environment. Current issues evolving out of past attitudes and policies. Cr 3.

**HTY 278 American Military History**

America's experience with warfare, from the colonial period through the Vietnam era. How American wars have been fought, and the com-

plex interrelationship between American society and the military, including economic, political and social factors. **Cr 3.**

#### **HTY 280 Naval History**

The history of navies in the modern period (c. 1500 to the present): The use of naval forces in the achievement of national goals, the development of naval technology and tactics, effects of naval construction and manning upon society, the sociology of navies, comparison of naval policies in various states, the current balance sheet of navies. **Cr 3.**

#### **HTY 301 History of Greece**

Ancient Greece from the "Heroic Age" to Alexander the Great. Discovery of rational thought, the development, crisis, and failure of democracy in classical Athens; unification of city-states and creation of a world empire that launched a new era in world history. Prerequisite: HTY 201 or HTY 105 or permission. **Cr 3.**

#### **HTY 332 Womanhood in America**

This course will examine the changing experiences of American women from colonial times to the present. Emphasis will be on what women did and what they were told to do, comparing the experiences of different groups of women, and examining the ways in which women worked to change their situation. No freshmen without permission of instructor. **Cr 3.**

#### **HTY 402 Roman History**

The rise of ancient Rome from a small Italian town to mistress of the Mediterranean. Problems of excessive greatness: failure of a city-state republic to rule a vast empire; triumph of Caesarism. The establishment of the "Roman Peace" under the emperors; problem of the "Decline and Fall of the Roman Empire. Prerequisite: HTY 201 or HTY 105 or permission. **Cr 3.**

#### **HTY 403 Early Middle Ages**

Europe from late antiquity to about 950, considering the social, economic, political, and intellectual developments during Merovingian and Carolingian times, emphasizing the early medieval agricultural revolution and reconstructing the factors affecting the lives of ordinary people. Prerequisite: HTY 105 or permission. **Cr 3.**

#### **HTY 404 Late Middle Ages**

Social, economic, political, and intellectual history of Europe from 950 to the Renaissance, focusing on the medieval frontier period and the

late medieval era of environmental crisis and economic contraction. Prerequisite: HTY 105 or permission. **Cr 3.**

#### **HTY 405 The Renaissance and Reformation**

The social, intellectual, cultural and economic achievements of the period 1300-1600. The Protestant and Catholic reforms and their effects will be evaluated. Prerequisite: HTY 105, 106 or permission. **Cr 3.**

#### **HTY 406 The Age of Monarchs, 1600-1789**

The socio-economic, political as well as cultural developments of Europe in the Early Modern period, emphasizing the history of several major countries such as, France, Prussia, the Austrian Empire and Russia. Prerequisite: HTY 105, HTY 106 or permission. **Cr 3.**

#### **HTY 407 The Age of Revolution, 1789-1860**

The effects of the Industrial and French Revolutions on European politics, society, and thought; the transformation of a peasant, agrarian world to a middle-class, urban society; from oligarchial to liberal politics, from aristocratic to middle-class tastes, from enlightened thought and the romantic reaction to Marxist and Darwinian intellectual bombshells. Prerequisite: HTY 105, 106 or permission. **Cr 3.**

#### **HTY 408 The Age of Liberalism, 1860-1919**

Europe from the liberalism of Bismarck, Cavour, Napoleon III, Disraeli, and Gladstone to the rise of mass democracy and the welfare state under the impact of a Second Industrial Revolution; the rise of socialism, emergence of modern thought, World War I, and the Russian Revolution. Prerequisite: HTY 106 or permission. **Cr 3.**

#### **HTY 409 Twentieth Century Europe, 1919 to Present**

An analysis of major political, economic, social and cultural developments in Europe since 1919, including the problems of democracy between the world wars, varieties of totalitarianism, World War II, the Russian imperium, and the development of today's affluent western European democracies. Prerequisite: HTY 105, HTY 106 or permission. **Cr 3.**

#### **HTY 419 Science and Society Until 1800**

Development of science from antiquity to the European scientific revolution. Examination of the history of science both 'internally'--as ideas and experiments--and 'externally'--as related to the societies which have produced them and upon which they in turn have had impact. Not open to freshmen. **Cr 3.**

**HTY 420 Science and Society Since 1800**

Development of science since the Scientific Revolution, with emphasis on America. Examination of the history of science both 'internally' as ideas and experiments—and 'externally'—as related to American and other societies which have produced them and upon which they in turn have had impact. Not open to freshmen. Cr 3.

**HTY 422 Modern France**

French history since the French Revolution. The internal political and social challenges from the Left and Right in the failure of three monarchies and three republics, the rise and decline of the French empire, economic growth and lag, Gaullism and the Fifth Republic, and French cultural leadership from Romanticism to Existentialism. Prerequisite: HTY 105, 106 or permission. Cr 3.

**HTY 423 History of Russia I**

Russian history from the earliest times to the 1870s, including political, economic, cultural and social developments during the Kievan, Tartar, Muscovite, and Imperial periods. Prerequisite: HTY 105, HTY 106 or permission. Cr 3.

**HTY 424 History of Russia II**

The history of the Russian Empire and the Soviet Union during the last 125 years, including the problems and achievements of Imperial Russia, World War I and the Bolshevik seizure of power, the development of Communist totalitarianism, Russia as a world power and contemporary dilemmas. Prerequisite: HTY 106 or permission. Cr 3.

**HTY 425 History of Germany I**

A survey of German history from the earliest times to the mid-19th Century, treating selected political, cultural, economic and social themes which help illuminate modern Germany. Prerequisite: HTY 105, HTY 106 or permission. Cr 3.

**TY 426 History of Modern Germany**

German history from the present, including major political, economic, cultural and social developments during the Imperial, Weimar, National Socialist and Federal Republic eras. Prerequisite: HTY 106 or permission. Cr 3.

**HTY 427 European Intellectual History I**

Interaction of ideas with society and politics in succeeding historical periods from late antiquity to 1700, emphasizing changing views toward man, society, science, literature, arts, religion and government. Prerequisite: HTY 201 or HTY 103 or HTY 105. Cr 3.

**HTY 428 European Intellectual History II**

Interaction of ideas with society and politics in succeeding historical periods from 1700 to the present, emphasizing changing views toward man, society, science, literature, arts, religion and government. Prerequisite: HTY 106. Cr 3.

**HTY 429 History of Modern Italy**

The course will cover the economic, social, political and cultural developments of the Italian people from 1815 to the present. It also explores the Italian migration to the U. S. Prerequisite: Six hours of history or permission. This course will be offered once every two years. Cr 3.

**HTY 431 Understanding European History Through Fiction**

The discussion of British and European works of fiction as sources for understanding European political and social history from the French Revolution to the present. Prerequisite: HTY 105, HTY 106 or permission. Cr 3.

**HTY 433 Greek and Roman Mythology**

The study of classical myths as the poetic expression of the Greek and Roman spirit, as the depiction of everything considered sacred, and as the embodiment of the basic patterns of the human psyche. Discussion of the major theories explaining myths and the use of modern psychology and anthropology to show how the myths reveal secrets of our emotional and intellectual lives. Prerequisite: HTY 201 or PHI 101 or LAT 101 or GRE 101 or permission. Cr 3.

**HTY 434 Greek and Roman Heritage in America**

The influence of Greek and Roman thought on North American culture from the colonial period to the 20th century. Prime examples: the idea of a Classical Republic, Greek architecture, pro and anti-slavery arguments based on Plato and Aristotle, and others. Prerequisite: any one course from the following HTY 106-201; PHI 101; LAT 101, 102; GRE 101, 102; ARH 251, 253, POS 389 or permission of the instructor. Cr 3.

**HTY 435 History of China I**

History and culture of the Chinese people from earliest times to the 19th century. Prerequisite: HTY 107, 108 or six hours of history, or permission. Cr 3.

**HTY 436 History of China II**

History and culture of the Chinese people, emphasizing the Western penetration of China, coming of the missionaries and the gunboats, impact of Western ideas, and the resulting

nationalist and revolutionary movements. Prerequisite: HTY 107, HTY 108 or six hours of history, or permission. **Cr 3.**

#### **HTY 437 History of Modern Japan**

The history of Japan during the past century. Western penetration, the influence of Western ideas on traditional Japanese culture, the emergence of the modern Japanese industrial state, and the rise and defeat of the Japanese empire. Prerequisite: HTY 107, HTY 108 or six hours of history or permission. **Cr 3.**

#### **HTY 441 History of Modern China**

An examination of social structure, foreign contact, value change and popular movements from the late Qing (19th century) until present. Emphasis will be on the relationship between popular uprisings (White Lotus, Muslim Nian, Taiping, Boxers, Red Spears, etc.) and the Communist Revolution. In addition, the Chinese case will be compared against those of other East Asian countries as well as against general theories of peasant revolt. Prerequisite: HTY 107, HTY 435 or HTY 436. **Cr 3.**

#### **HTY 442 The United States and Vietnam: A History**

This course will trace the history of the relations between the United States and Vietnam since the beginning of World War II. The economic, social, political, ideological and cultural origins of the Vietnam conflict, the conduct of the war and the aftermath in Vietnam, East Asia and the United States will be examined. Prerequisite: HTY 103 or HTY 104 or permission. **Cr 3.**

#### **HTY 446 History of Modern Middle East (1800-Present)**

The economic, social and political transformations that the Middle East experienced in the nineteenth and twentieth centuries. Particular focus is given to the rise of Arab nationalism and the Israeli Arab conflict. Prerequisite: One survey course in history. **Cr 3.**

#### **HTY 447 Latin America: Under the Conquerors**

Changes brought by Iberian conquest and colonization in the lives of the native peoples of Latin America. Individual and group resistance and accommodation, contributing to cultural change and continuity. Considerable attention to agrarian and labor themes in the central areas. Prerequisite: HTY 109 or permission. **Cr 3.**

#### **HTY 448 Latin America: Reform and Revolution**

Nineteenth and twentieth-century reform movements and revolutionary struggles in

Latin America; their local historical roots and their international ramifications. Mexico, Cuba, Central America, and other case studies. Prerequisite: HTY 109 or permission. **Cr 3.**

#### **HTY 452 Topics in Latin American History**

Analysis of varying political, economic, social, and/or cultural topics highlighted in the recent scholarship on Latin American history. Readings, discussions, research paper. Prerequisite: HTY 109 or permission. **Cr 3.**

#### **HTY 455 History of England I**

The political, socio-economic and constitutional aspects of British history from Roman Britain to 1700, emphasizing economic growth and the development of political institutions. Prerequisite: HTY 105, HTY 106 or six hours of history. **Cr 3.**

#### **HTY 456 History of England II**

The political, socio-economic and constitutional aspects of British history from 1700 to the present, emphasizing economic growth and the development of democracy. Prerequisite: HTY 105, HTY 106 or six hours of history. **Cr 3.**

#### **HTY 458 History of French Canada and Franco-Americans**

The common historical heritage of French Canadians and Franco-Americans from the establishment of New France and Acadia to the great migrations to the United States in the 19th century, and the separate development of French Canadians and Franco-Americans after that. 6 hours of History. **Cr 3.**

#### **HTY 459 Colonial Canada**

Canada's history from New France to 1850, emphasizing political, social and economic developments and relations with the American people. Prerequisite: HTY 103, HTY 111 or permission. **Cr 3.**

#### **HTY 460 Modern Canada**

Canada's history from Confederation to the present, emphasizing political, social, and economic developments and Canada's relations with the United States. Prerequisites: HTY 104, HTY 111 or permission. **Cr 3.**

#### **HTY 461 America Takes Shape: The Colonies to 1740**

The founding and development of the American colonies. The expropriation of Indian lands, enslavement of blacks, the role of women, the American family, and internal conflicts will be emphasized. Prerequisite: HTY 103 or permission. **Cr 3.**

**HTY 462 Rebellion and Revolution in America, 1740-1789**

The social tensions of a maturing society: rebellions, religious revivals, violence. The origins and consequences of the American Revolution, Founding Fathers and the new Constitution. Prerequisite: HTY 103 or permission. Cr 3.

**HTY 463 Creating and Testing the American Nation, 1789-1840**

Problems and processes involved in establishing a viable society. Major events, issues, and institutions political, economic, and cultural with particular emphasis on the interrelationship between ideas and actions. Prerequisite: HTY 103 or permission. Cr 3.

**HTY 464 America at the Crossroads: The Era of Civil War Reconstruction, 1840-1876**

Problems and processes involved in territorial expansion, economic growth, the slavery issue, civil war, and the reconstruction of American society. Prerequisite: HTY 103 or permission. Cr 3.

**HTY 466 Industrialization, Urbanization, and Reform, 1877-1916**

The transformation of the United States to a predominately industrial, urban society. Business growth, farm problems, immigration, labor organization, regular and reform politics, and imperialism. Prerequisite: HTY 104 or permission. Cr 3.

**HTY 467 Early 20th Century America, 1914-1945**

The Wilson era of reform and intervention in World War I, the age of business, depression and the New Deal of FDR, World War II and American global power. Changes in American politics, economics, society, and culture. Prerequisite: HTY 104 or permission. Cr 3.

**HTY 468 America Since 1945**

The Cold War and McCarthyism, protest movements of the 1960s, Watergate, the energy crisis and economic recession, affluence and poverty in the 1980s. Changes in American politics, economics, society, and culture. Prerequisite: HTY 104 or permission. Cr 3.

**HTY 469 American Ideas I**

Major ideas emerging from and shaping the American experience. Formal ideas as well as broad social movements considered, e. g. transcendentalism, pragmatism, and reform. Interrelationships between ideas and actions, conceptualizations and structures. Prerequisite: HTY 103, HTY 104 or permission. Cr 3.

**HTY 470 American Ideas II**

Major ideas emerging from and shaping the American experience. Formal ideas as well as broad social movements considered, e. g. transcendentalism, pragmatism, and reform. Interrelationships between ideas and actions, conceptualizations, and structures. Prerequisite: HTY 103, HTY 104 or permission. Cr 3.

**HTY 471 Economic History of the United States I**

The development of the American economy from the colonial period to 1865, including agriculture, trade and commerce, industrialization, transportation, money and banking, changing concepts of business enterprise and American capitalism, the US in a world economy and the growth of governmental involvement in the economy. Prerequisite: HTY 103, HTY 104 or permission. Cr 3.

**HTY 472 Economic History of the United States II**

The development of the American economy from 1865 to the present, including agriculture, trade and commerce, industrialization, transportation, money and banking, changing concepts of business enterprise and American capitalism, the US in a world economy and the growth of governmental involvement in the economy. Prerequisite: HTY 103, HTY 104 or permission. Cr 3.

**HTY 473 American Diplomatic History I**

American diplomatic history from the revolution to World War I, emphasizing the formation and application of America's major foreign policies. Prerequisite: HTY 103, HTY 104 or permission. Cr 3.

**HTY 474 American Diplomatic History II**

American diplomatic history from World War I to the present, emphasizing the formation and application of America's major foreign policies. Prerequisite: HTY 103, HTY 104 or permission. Cr 3.

**HTY 475 American Social History I**

Analysis of the ways in which social values, practices, and institutions have changed or persisted as the US evolved from an agrarian to an industrialized society, concentrating on work patterns, ethnic and racial variations, family function, class structure, religious and educational institutions, distinctive roles determined by age and sex, and the means employed for community service and social control in the United States from 1607 to 1850.



Prerequisite: HTY 103, HTY 104 or permission.

Cr 3.

### **HTY 476 American Social History II**

Analysis of the ways in which social values, practices, and institutions have changed or persisted as the US evolved from an agrarian to an industrialized society, concentrating on work patterns, ethnic and racial variations, family function, class structure, religious and educational institutions, distinctive roles determined by age and sex, and the means employed for community service and social control in the United States from 1850 to the present. Prerequisite: HTY 103, HTY 104 or permission.

Cr 3.

### **HTY 482 Canada and the American Economy**

Role and impact of the American investment and technology on Canada, relations between American businessmen and Canadian elites, respective industrial relations systems, U. S. trade unions in Canada, trade legislation and other government policies affecting the North American economy. Prerequisite: HTY 459, HTY 460 or HTY 471, HTY 472 or ECO 438 or BUA 345 or permission.

Cr 3.

### **HTY 484 History of Jazz**

Origin and development of the American form of improvised music popularly known as "Jazz." Study and analysis of the styles of Jazz as forms of musical art. The approach will be through exposure to the music, especially as played by the major innovators and the different styles they represent. Prerequisite: HTY 103, HTY 104 or permission.

Cr 3.

### **HTY 485 World Maritime History I**

The growth of human understanding, use and interaction with the seas from prehistory to 1800. Demographic and social effects of the seas on human populations, marine technology, economics of the seas, national and international ramifications. Not open to freshmen.

Cr 3.

### **HTY 486 World Maritime History II**

The growth of human understanding, use and interaction with the seas from 1800 to the present. Demographic and social effects of the seas on human populations, marine technology, economics of the seas, national and international ramifications, contemporary problems. Not open to freshmen.

Cr 3.

### **HTY 491 Technology and Society Until 1800**

Development of technology from earliest times through the English Industrial Revolution. Ex-

amination of the history of technology both 'internally'--as tools and machines--and 'externally'--as related to the societies which have produced them and upon which they in turn have had impact. Not open to freshmen.

Cr 3.

### **HTY 492 Technology and Society Since 1800**

Development of technology since the English Industrial Revolution, with emphasis on America. Examination of the history of technology both 'internally'--as tools and machines--and 'externally'--as related to American and other societies which have produced them and upon which they in turn have had impact. Not open to freshmen.

Cr 3.

### **HTY 494 Women, History and American Society: Selected Topics**

This course will examine the changing experiences of American women via several intensive, typical interdisciplinary explorations. Emphasis will be women's historical relationship with different institutions or bodies of knowledge. For example, such a course could take up a topic such as the history of women, family, and the law, women and technology, women and work, or women and racism. May be repeated once for a different topic. Prerequisite: 6 hours of history or permission.

Cr 3.

### **HTY 499 Contemporary Problems in History**

An analysis in depth of a selected controversial and contemporary historical problem. The topic to be studied and the method of approaching it will be chosen jointly by interested students and the staff. Prerequisite: permission.

Cr 1-3.

### **HTY 498 Senior Seminar in History**

Intensive reading, research, and writing under the close supervision of an instructor on a selected problem in American or European history. Required of History majors; offered each semester.

Cr 3.

### **HTY 501 American Diplomatic History**

Advanced reading seminar. Problems, interpretations, and issues in American diplomacy such as maritime neutral rights, expansion, role of military and naval powers. Content varies. Seminar discussion, reports and papers. Prerequisites: graduate students, senior history majors and others by permission.

Cr 3.

### **HTY 502 American Intellectual History**

Advanced reading seminar. Major intellectual currents in American history, e. g. , Transcendentalism, Pragmatism, etc.

dentalism, Pragmatism, progress, mission. Interrelationship between ideas and their social environment. Content varies. Seminar discussion, reports and papers. Prerequisites: graduate students, senior history majors and others by permission. Cr 3.

#### **HTY 503 American Regional History**

Advanced reading seminar. Emphasis upon various historically discrete areas, such as the South, West, New England; their distinctive development and interrelationship to broader American history. Content varies. Seminar discussion, reports, and papers. Prerequisites: graduate students, senior history majors and others by permission. Cr 3.

#### **HTY 504 American Economic History**

Advanced reading seminar. Development of American economics in its historical setting. Major economic theories and their impacts. Government business relationships. Content varies. Seminar discussion, reports and papers. Prerequisites: graduate students, senior history majors and others by permission. Cr 3.

#### **HTY 505 American Political History**

Advanced reading seminar. Major political ideas; constitutional and legal development; political issues and their impact on American society; political party evolution. Content varies. Seminar discussion, reports, and papers. Prerequisite: graduate students, senior history majors and others by permission. Cr 3.

#### **HTY 506 American Social History**

Advanced reading seminar. Emphasis, among others, on the problems and issues of family, urban, ethnic, and labor history and historical utilization of social science methods. Content varies. Seminar discussion, reports, and papers. Prerequisites: graduate students, senior history majors and others by permission. Cr 3.

#### **HTY 517 Seminar in Premodern European History**

Current research on premodern European history, especially as applied to graduate research and problems of teaching high school and college European or World Civilization. Cr 3.

#### **HTY 518 Readings Seminar in Modern European History**

Reading and discussion of important recent books and articles in modern European history. Emphasis on publications and historical problems which apply to teaching European and world history on the secondary school and col-

lege levels and on preparation for graduate study in European history. Prerequisite: seniors and graduate students. Cr 3.

#### **HTY 519 Modern England**

Evaluation of selected problems in English history since 1815. Among areas treated are the gradual democratization of British government, continuing industrial revolution, and impact of two world wars on English social, cultural and political life. Lectures, readings, class reports, research papers. Prerequisites: graduate students, senior history majors, and others by permission. Cr 3.

#### **HTY 521 Canada and the United States, 1783 to the Present**

Wars, migration, boundaries, resources, and trade, emphasizing the historical background to contemporary political, strategic, economic, and cultural issues in Canadian-American relations. Prerequisite: HTY 459, HTY 460, or HTY 473, HTY 474 or POS 374 or permission. Cr 3.

#### **HTY 522 Canadian Economic History**

History and theory of Canadian staple development; political influences on land, resources, and industrialization policy; the social context shaping Canadian business elites and laboring classes; contemporary trends. Prerequisite: HTY 459, 460 or HTY 471, 472, or ECO 438 or ARE 471 or permission. Cr 3.

#### **HTY 540 Seminar in Modern Asian History**

Research-oriented study of major themes of Asian history in the 19th and 20th centuries, impact of Western colonialism, rise of nationalism, and emergence of contemporary leadership in East, Southeast, and South Asia. Prerequisite: graduate students, senior history majors and others by permission. Cr 3.

#### **HTY 550 Readings in Bibliography and Criticism in:**

1. United States History
2. European History
3. British and Commonwealth History
4. Canadian History
5. Latin American History
6. Asian History

Cr Ar.

#### **HTY 551 Latin America and the United States**

United States participation and intervention in Latin American affairs from the early 19th century to the present. Lectures, readings, class reports, and research reports. Prerequisite: graduate students, senior history majors, and others by permission. Cr 3.

**HTY 570 Government-Business Relations in American History**

Studies in problems such as federal regulation of business, antitrust policy, the government as entrepreneur and as manager of the economy viewed in historical perspective. Lectures, readings, class reports, and research papers. Prerequisite: Graduate students, senior history majors and others by permission. Cr 3.

**HTY 583 The Maritime Frontier: Policies and Affairs**

Examination of the relationship of maritime activity to national development from colonial times to the present, including technological developments, unionization, international competition, relationships to foreign policy, and special assistance to maritime industries. Governmental policies affecting use of the ocean as an economic resource, ranging from fisheries to oil drilling. Prerequisite: Graduate students, senior history majors, and others by permission. Cr 3.

**HTY 597 Field Work in Historical Institutions**

Field work in local museums, state agencies, and other historic laboratories. Instruction will involve preparation and repair of exhibits, research and preparation of historic preservation documents, and beginning archival and arti-

fact handling. Prerequisite: graduate students, senior history majors and others by permission. Cr 3-12.

**HTY 598 Editing and Producing a History Journal**

This course introduces graduate students in history to the various stages and procedures involved in editing and producing a scholarly journal in history, including editorial revisions, layout, graphics, proofreading, and printing. In format, the course is a practicum associated with the publication of the *Maine Historical Society Quarterly* (MHSQ). Prerequisite: graduate standing. Cr 1-3.

**HTY 599 Special Topics in History**

A flexible course designed to explore and analyze new trends in research and interpretation in history. Prerequisite: graduate students, senior history majors and others by permission. Cr 3.

**Interdisciplinary Course**

**INT 537 (HTY) The Evolution and Development of Canadian Government and Politics**  
Examination of theoretical structure and historical development of government and politics in Canada. Prerequisite: POS 335, HTY 460 or permission. Cr 3.

## International Affairs

A student may major in International Affairs in anthropology, economics, foreign languages, history, or political science.

During the first two years, the student of International Affairs should take courses which help to fulfill the distribution requirements for the B. A. degree. Among such courses are ANT 215 Social Anthropology, ECO 120 Principles of Microeconomics and ECO 121 Principles of Macroeconomics, HTY 106 History of European Civilization II, or HTY 107/108 Asian Civilization, POS 100 American Government, and courses in a modern foreign language. Students should consult also with International Affairs advisers in the participating departments regarding other courses they might take. To enter the junior year of the International Affairs program a student must have earned a minimum grade point average of 2.0

or have received permission from the Committee on International Affairs.

### Basic Requirements

**International Affairs in Anthropology**

- A. At least thirty (30) hours in Anthropology, including ANT 215 and ANT 499. Other courses which might be taken:
- ANT 441 People and Cultures of the Pacific Islands
  - ANT 442 Mediterranean Ethnology
  - ANT 453 People and Cultures of Mesoamerica
  - ANT 454 Cultures and Societies of the Middle East
  - ANT 455 Peoples and Cultures of Sub-Saharan Africa
  - ANT 461 Islamic Fundamentalism

- ANT 464 Cultural Ecology  
 ANT 465 Political Anthropology  
 ANT 466 Economic Anthropology  
 ANT 467 Peasant Studies  
 ANT 468 Social Anthropology of Complex Societies  
 ANT 481 Language and Culture  
 ANT 491 Intercultural Understanding  
 INT 410 Introduction to the Study of Linguistics  
 INT 458 Culture and Economic Change  
 GEO 215 Cultural Geography  
 GEO 350 The Geography of Canada
- B. At least nine (9) hours each in economics, history, and political science from among the following courses:
1. Economics
    - ECO 120 Principles of Microeconomics
    - ECO 121 Principles of Macroeconomics
    - ECO 313 The Economies of Southeast Asia
    - ECO 435 History of Economic Thought
    - ECO 436 Marxian Economics
    - ECO 437 Comparative Economic Systems
    - ECO 438 Economic Development
    - ECO 439 International Trade and Commercial Policy
  2. History
    - HTY 107/108 Asian Civilization
    - HTY 215/216 The World in the Twentieth Century
    - HTY 407 The Age of Revolution: 1789-1860
    - HTY 408 The Age of Liberalism: 1860-1919
    - HTY 409 Twentieth Century Europe: 1919-present
    - HTY 422 Modern France
    - HTY 424 History of Russia II
    - HTY 426 History of Germany II
    - HTY 429 History of Modern Italy
    - HTY 437 History of Modern Japan
    - HTY 441 History of Modern China
    - HTY 446 History of Modern Middle East (1800-present)
    - HTY 447 Latin America: Under the Conquerors
    - HTY 448 Latin America: Reform and Revolution
    - HTY 452 Topics in Latin American History
    - HTY 456 History of England II
    - HTY 460 Modern Canada
    - HTY 473/474 American Diplomatic History
3. Political Science
- POS 121/122 Current World Problems
  - POS 223/224 Political Geography
  - POS 241 Politics in Contemporary Societies
  - POS 243 Canadian Government and Politics
  - POS 252 United States-Canadian Relations
  - POS 335 Democratic Governments of Europe
  - POS 336 The Communist Government of the Soviet Union
  - POS 344 Public Policy in Canada
  - POS 373 International Relations
  - POS 374 United States Foreign Policy
  - POS 387 International Law
  - POS 388 World Order Through International Organization and Law
  - POS 456 Canadian Political Parties
  - POS 465 Governments of South Asia
  - POS 466 Governments of East Asia
  - POS 467 African Politics
  - POS 468 Contemporary Politics of Latin America
  - POS 475 National Security Analysis
  - POS 477 Politics of the Middle East
  - POS 478 Foreign Policy of the Soviet Union
  - POS 531 Topics in Comparative Politics
  - POS 573 Problems in International Politics
  - POS 587 Problems in International Law
- C. At least one (1) year of a modern foreign language beyond the intermediate level.
- International Affairs in Economics**
- A. At least twenty-seven (27) hours in economics, one math course and one statistics course. The course requirements are:
1. Economics
    - ECO 120 Principles of Microeconomics\*
    - ECO 121 Principles of Macroeconomics\*
    - ECO 421 Intermediate Macroeconomics
    - ECO 420 Intermediate Microeconomics
    - ECO 437 Comparative Economic Systems
    - ECO 438 Economic Development
    - ECO 439 International Trade and Commercial Policy and two additional 300 level economics courses.
  2. Math: one math course from the follow-

\*ECO 110 and either ECO 120 or ECO 121 may be substituted with departmental permission. Students taking ECO 120 and ECO 121 may not receive credit for ECO 110.

ing: MAT 113, Mathematics for Business and Economics, MAT 122 Algebra and Trigonometry, MAT 126, Analytical Geometry and Calculus, MAT 151, Calculus for the Life Sciences I, MAT 241, Mathematical Logic. MAT 126 is recommended for students considering graduate work in economics.

3. Statistics: one course from the following: MAT 215, Introduction to Statistics for Business and Economics, MAT 232, Principles of Statistical Inference, MAT 434, Introduction to Statistics.
- B. At least nine (9) hours each in anthropology, history, and political science from among the following courses or from among others with an international focus:
  1. Anthropology. (See Anthropology listing under International Affairs in Anthropology, A. , above).
  2. History. (See History listing under International Affairs in Anthropology, B. 2. , above).
  3. Political Science. (See Political Science listing under International Affairs in Anthropology, B. 3. , above).
- C. At least one (1) year of a modern foreign language beyond the intermediate level.

#### **International Affairs in Foreign Languages**

- A. Twenty-four (24) hours above the introductory level in one modern foreign language.
- B. At least nine (9) hours each in anthropology, economics, history, and political science from among the following courses or from among others with an international focus:
  1. Anthropology. (see Anthropology listing under International Affairs in Anthropology, A. , above.)
  2. Economics. (see Economics listing under International Affairs in Anthropology, B. 1. , above.)
  3. History. (see History listing under International Affairs in Anthropology, B. 2. , above.)
  4. Political Science. (See Political Science listing under International Affairs in Anthropology, B. 3. , above.)
- C. Additional electives relating to international affairs arranged in consultation with major adviser. Highly recommended: a course in contemporary civilization and

geography of the culture whose language is being studied.

#### **International Affairs in History**

- A. At least twenty-seven (27) hours in history. Among such courses may be those listed under International Affairs in Anthropology, B. 2. , History.
- B. At least nine (9) hours each in anthropology, economics, and political science from among the following courses or from among others with an international focus:
  1. Anthropology. (see Anthropology listing under International Affairs in Anthropology, A. , above.)
  2. Economics. (see Economics listing under International Affairs in Anthropology, B. 1. , above.)
  3. Political Science. (See Political Science listing under International Affairs in Anthropology, B. 3. , above.)
- C. At least one (1) year of a modern foreign language beyond the intermediate level.

#### **International Affairs in Political Science**

- A. At least twenty-four (24) hours in political science in addition to POS 100. Among such courses may be those listed under International Affairs in Anthropology, B. 3. , above.
- B. At least nine (9) hours each in anthropology, economics, and history or among the following courses or from among others with an international focus:
  1. Anthropology. (see Anthropology listing under International Affairs in Anthropology, A. , above.)
  2. Economics. (see Economics listing under International Affairs in Anthropology, B. 1. , above.)
  3. History. (See History listing under International Affairs in Anthropology, B. 2. , above.)
- C. At least one (1) year of a modern foreign language beyond the intermediate level.

Details of programs covering the last two years of study in each discipline may be obtained from the participating departments or from Walter S. Schoenberger, Coordinator, Committee on International Affairs, 33 North Stevens Hall, University of Maine at Orono, Orono, Maine 04469.

## School of Performing Arts

### Music

Associate Professor Hallman (Chair); Professors Cox, Jacobs; Associate Professors Foley, Hall, F. Heath, Nesbit, Ogle, Roscetti, Stratton, Voronietzky; Assistant Professors Farnham, Marrs, Wieck; Instructors Crook, Garwood, S. Heath, Mathews, Mummé, Parella, Worley The curricula of the Department of Music lead to baccalaureate degrees as follows:

#### Bachelor of Arts Degree with a Major in Music

This program is designed for the study of music within a strong liberal arts curriculum. It offers a broad coverage of the field of music with emphasis on the study of the history and theory of music. It furnishes an appropriate background for prospective candidates for advanced degrees who are preparing for such careers as musicologists, composers, and music librarians. It does not qualify the graduate for certification as a public school music teacher. Candidates for the degree are expected to attain a level of performing ability equivalent to that required at the completion of the sophomore year in the Bachelor of Music program. A senior project is required in lieu of a recital. The total number of required semester hours in music is forty eight.

Music Theory	16
Music History and Literature	10
Performance Emphasis (eight semesters)	8
Senior Project	1
Music Organization	4
Music Electives (theory or history)	<u>9</u>
	48
Liberal Arts	<u>72</u>
Total Credits	120

#### Bachelor of Music in Music Education

This is a four-year professional degree for students who intend to make music a career either as a public school teacher or supervisor of music. The degree provides for many professional opportunities and serves also as preparation for graduate study in music

education. Upon satisfactory completion of the music education course of study, the student is certified to teach music at both the elementary and secondary levels. A half-hour recital is required in the junior year. The total number of required semester hours in music is 81.

Music Theory	22
Music History and Literature	10
Major Performance Area	12
Music Organization	7
Basic Conducting	2
Instrumental concentration	18
OR	
Vocal/Keyboard concentration	18
Music Education Sequence	<u>10</u>
	81
Professional Education	18
Liberal Arts	<u>27</u>
Total Credits	126

#### Bachelor of Music in Performance

This degree is designed to assist the gifted music student to prepare for a career in music performance. It serves also as preparation for graduate study in music and teaching at the college level. Emphasis is placed on performance, music theory, music history, and studies in the liberal arts. The degree is granted in the following applied music areas: Strings, woodwinds, brass, piano, harpsichord, voice, guitar, and pipe organ. Graduation requirements include appropriate proficiency in playing or singing, excellent memory, substantial repertoire, and musicianship of a high order. A half-hour recital is required in the junior year and a full recital in the senior year. The total number of required semester hours in music is 87.

Music Theory	28
Music History and Literature	16
Performance Major	16-18
Performance Minor	4
Music Organization	8
Conducting	5
Appropriate Literature Course	1
Electives in Music	<u>7-9</u>
	87
Liberal Arts	<u>33</u>
Total Credits	120

## Entrance Requirements for all Degree Programs

In addition to meeting the University's admission standards, applicants must demonstrate musical ability in performance on their major instrument or voice before a jury of the music faculty. Each applicant is also required to have an interview with a faculty advisor in the student's chosen program. Auditions and interviews are arranged through the music department office, where a listing of audition requirements for the various disciplines may be obtained. All entering students are required to take placement examinations in music theory.

## Graduation Requirements

In addition to successful completion of all required course work, all music degree students must, in order to graduate:

1. Pass a basic proficiency examination in piano. Note: Piano proficiency may be accomplished through successful completion of MUP 205, 206, 215 and 216. Piano majors are required to pass the proficiency exam for these courses. No music student other than piano majors will be allowed to study private piano until completion of MUP 216, successful completion of the equivalent piano proficiency exam or permission.
2. Achieve a grade of "C" or better in any sequential music course.

Candidates for the B. A. degree in Music must successfully pass the sophomore level jury examination on their applied major instrument or voice.

Candidates for the B. M. Ed. degree must present an approved half-hour public recital in their junior year.

Candidates for the B. M. Perf. degree must present an approved half-hour public recital in their junior year and an approved one-hour public recital in their senior year.

## Applied Music Fees

For the Music Major no fees will be charged for required private instruction.

For the non-music major and for private instruction not required of music majors, a fee of \$90 per semester will be charged for one one-half hour lesson per week, a fee of \$180 per semester will be charged for one one-hour lesson per week. Private instruction for the non-music major is contingent on the student's level

of performance as determined by audition, and on the availability of studio time of the instructor. Arrangements for such instruction and assignment of a teacher must be made through the office of the Music Department.

Practice facilities are provided in the music building. The University provides, so far as possible, practice opportunities for students who take applied music for credit.

## Courses in Applied Music

The Department of Music provides private instruction in instruments and voice. MUS 201 through MUS 308 designates semester of study for one credit hour; section number (see below) designates instrument/voice.

MUS 210 through MUS 380 designates semester of study for two credit hours; section number (see below) designates instrument/voice.

Candidates for B. Mus. and B. M. Ed. enroll for two hours of credit for the major instrument or voice, and one hour of credit for the second instrument or voice. B. A. candidates majoring in music and all other students normally enroll for one hour of credit.

### B. Mus., B. M. in Mus. Educ. candidates

First level	MUS 210-220
Second level	MUS 230-240
Third level	MUS 350-360
Fourth level	MUS 370-380

### B. A. (Major in Music) candidates

All others	
First level	MUS 201, 202
Second level	MUS 203, 204
Third level	MUS 305, 306
Fourth level	MUS 307, 308

The student who does not meet the requirements for the level at the end of each semester as determined by the jury examination will continue on the previous level until the requirements are met. Upon completion of 8 credit hours of work in Applied Music, music majors will be reviewed by a jury composed of the faculty of the Department of Music to determine whether they should be advanced to upper level standing in applied music.

Section	Instructor
01 baritone horn	Heath
02 bass	Staff
03 bassoon	MacDonald
04 cello	Roscetti
05 clarinet	Jacobs

06 flute	S. Heath
07 french horn	Nesbit
08 classical guitar	Crook
09 harpsichord	Mummé
10 oboe	Hall
11 organ	Mummé
12 percussion	Marrs
13 piano	Foley, Voronietsky
14 saxophone	Worley
15 trombone	F. Heath
16 trumpet	Stratton
17 tuba	F. Heath
18 violin	Wieck
19 viola	Wieck
20 voice	Parella, Ogle

Courses in applied music may be repeated for credit.

Each student taking instruction in an applied area must take an examination before a jury of the faculty of music at the end of each semester. All music majors enrolled in applied music are required to enroll in MUS 100 (Recital Lab) each semester of study.

## Courses in Music Education

### **MUE 101 Music Methods for the Elementary Teacher**

Methods and materials for relating music to the elementary school child. No previous experience in music required. **Cr 3.**

### **MUE 105 Music for the Elementary Classroom Teacher I**

Basic musicianship for the classroom teacher with an emphasis on beginning theory; skill development in singing and classroom instrument techniques; and appropriate techniques for elementary classroom use. **Cr 2.**

### **MUE 106 Music for the Elementary Classroom Teacher II**

Advanced musicianship for the classroom teacher with an emphasis on the continuation of materials, concepts and skill development from MUE 105. Additional exposure to rhythmic movement, improvisation and instrumental techniques, and harmony are provided. Prerequisite: MUE 105. **Cr 2.**

### **MUE 207 Voice Class**

The systematic development of the principles of good singing through class method approach. Prerequisite: MUY 101 or equivalent. Lab 2. **Cr 1.**

### **MUE 209 String Class**

Basic performance and pedagogical skills per-

taining to each of the four string instruments. Prerequisite: MUY 101 or equivalent. Lab 4.

**Cr 2.**

### **MUE 210 Introduction to Music Education**

Exposure to classrooms in primary and secondary music settings. Philosophies of music education. Programming and evaluation. Open to all music majors. **Cr 2.**

### **MUE 213 Woodwind Class**

Basic performance and pedagogical skills pertaining to the woodwind instruments. Prerequisite: MUY 101 or equivalent. Lab 4.

**Cr 2.**

### **MUE 215 Early Music Teaching Field Experience**

Visitations to public school classrooms for observation and teaching experience. Approximately five weeks will be spent in each of three areas: elementary, junior high and high school. Open to freshman or sophomore music education majors. No prerequisites. **Cr 2.**

### **MUE 217 Brass Class**

Basic performance and pedagogical skills pertaining to the brass instruments. Prerequisites: MUY 101 or equivalent. Lab 4. **Cr 2.**

### **MUE 222 Percussion Class**

Basic performance and pedagogical skills pertaining to the percussion instruments. Prerequisite: MUY 101 or equivalent. Lab 4.

**Cr 2.**

### **MUE 320 Teaching of General Music in the Elementary School**

Methods, materials, organization and administration of the music curriculum in the public schools. Prerequisite: MUY 212 and MUL 222.

**Cr 3.**

### **MUE 321 Teaching of General Music in the Junior High School**

Organization and teaching of general music classes in the junior high school. Prerequisite: MUE 320 or equivalent. **Cr 3.**

### **MUE 400 Choral Music Education**

The organization and development of techniques requisite to a successful choral program. Open to all music majors. **Cr 3.**

### **MUE 401 Advanced Instrumental Methods and Pedagogy**

A culmination of prior skills in a laboratory setting dealing with issues and techniques relative to instrumental music teaching. Prerequisites: MUP 345, MUE 209, MUE 213, MUE 217, MUE 222. Offered every fall. **Cr 2.**



**MUE 402 Piano Pedagogy**

An introduction to pedagogical materials for piano drawn from available teaching systems and literature. Open to undergraduate piano students. Offered every two years. Cr 3.

**MUE 403 Instrumental Laboratory**

Performance on secondary instruments in a heterogeneous setting. Required for those enrolled in MUE 401 but may be taken separately. Instrumental majors must attend Instrumental Laboratory for two of the three fall semesters following their freshman year. Open to sophomore, junior and senior music education majors. Offered every fall. Lab 1. Cr 1.

**Courses in Music History****MUH 201 History of Western Music I**

The history of music from antiquity to the present day with a technical study of the significant musical trends. Prerequisite: For the major, MUL 222, or sophomore standing. For the general student, permission of the instructor.

Cr 3.

**MUH 202 History of Western Music II**

The history of music from antiquity to the present day with a technical study of the significant musical trends. Prerequisite: For the major, MUL 222, or sophomore standing. For the general student, permission of the instructor.

Cr 3.

**MUH 517 Music of the Baroque Period**

A study of music in the 17th and first half of the 18th centuries; from Monteverdi and Schutz to Bach and Handel. Prerequisite: MUH 202 or permission of the instructor.

Cr 3.

**MUH 519 Music of the Classical Period**

The changing style in form and content as evolved by Haydn, Mozart and Beethoven viewed against the background of social and political conditions of the time. Prerequisite: MUH 202, or permission of the instructor.

Cr 3.

**MUH 521 Music of the Romantic Period**

Study of musical expression during the 19th century with emphasis on the intellectual foundations of the romantic movement. Study and detailed analysis of representative works from Beethoven through Debussy. Prerequisite: MUH 202 or permission of the instructor.

Cr 3.

**MUH 523 Music of the Twentieth Century**

Trends in contemporary music and their relationship to the cultural and political life of our

time. Prerequisite: MUH 202 or permission of the instructor. Cr 3.

**Courses in Music Literature****MUL 101 The Art of Listening to Music: Elements**

MUL 101 will be directed to students that have not had any previous experience in music. The course will give the students a working vocabulary of terms and listening experiences which are designed to expand the basic understanding of the art form. Music listening assignments will use the audio/visual equipment in Fogler Library including the digital CD audio and the interactive laser videodisc equipment. Prerequisite: open to all university students. Cr 3.

**MUL 202 The Art of Listening to Music: Historical Survey**

MUL 202 will start with the assumption that the student has had previous experience in music, either MUL 101 or performance experience. While terms and listening experiences also will be a goal of the course, the focal point of study will be a one-semester historical survey of music from 1600 to the present. Music listening assignments will use the audio/visual equipment in Fogler Library including the digital CD audio and the interactive laser videodisc equipment. Prerequisites: MUL 101 or permission of the instructor. Cr 3.

**MUL 203 Vocal Literature**

A survey through discussion and performance of vocal literature from the 18th century to the present day to include classic Italian songs, German Lieder, French art songs, and contemporary American and British songs. Cr 1.

**MUL 205 Woodwind Literature**

A survey through discussion and performance of woodwind literature to familiarize the student with the standard repertory. Cr 1.

**MUL 207 Brass Literature**

A survey through discussion and performance of brass literature to familiarize the student with the standard repertory. Cr 1.

**MUL 209 String Literature**

A survey through discussion and performance of string literature to familiarize the student with the standard repertory to include that composed for string quartet. Cr 1.

**MUL 211 Piano Literature**

A survey through performance and discussion of standard literature for piano. Cr 1.

**MUL 213 Organ Literature**

A survey through discussion and performance of standard literature for organ. Cr 1.

**MUL 221 Survey of Music Literature I**

A comparative study of styles, characteristics, forms, and performing mediums of music from the Renaissance to the present. Primarily for music majors. Cr 2.

**MUL 222 Survey of Music Literature II**

A comparative study of styles, characteristics, forms, and performing mediums of music from the Renaissance to the present. Primarily for music majors. Cr 2.

**MUL 531 Choral Literature and Performance Practice**

Survey of choral literature from the Renaissance to the present. Cr 3.

**MUL 541 Instrumental Ensemble Literature and Performance Practice**

Survey of selected instrumental ensemble literature from the standard repertory. Prerequisite: Permission. Cr 3.

### Courses in Musical Organizations and Ensembles

**MUO 101 University Singers**

Rehearsal and performance of choral concert repertoire. Membership through audition requires sight reading ability. Extended concert tours. Four hours of rehearsal a week. Attendance at all rehearsals and public performances required. May be repeated for credit. Lab 5.

Cr 1.

**MUO 103 Oratorio Society**

Rehearsal and performance of major choral works. Membership through audition. Attendance at all rehearsals and public performances required. May be repeated for credit. Lab 2.

Cr 1.

**MUO 109 University Chorus**

Rehearsal and performance of choral music appropriate for choral singers with limited background and training. No audition required. Open to all students. Attendance at all rehearsals and public performances required. May be repeated for credit. Lab 2.

Cr 1.

**MUO 111 Marching Band**

Marches at home and occasional off-campus football games. Begins four days prior to opening of classes. Rehearses concert music on limited schedule during final weeks of semester.

Attendance required at rehearsals and performances. Membership by permission of director. May be repeated for credit. (Fall semester only). Lab 4.

Cr 1.

**MUO 112 Concert Band**

Rehearses and performs a variety of concert band literature appropriate for the general University instrumentalist. Attendance required at rehearsals and performances. Performs both on and off campus. May be repeated for credit. Membership by permission of director. (Spring semester only). Lab 3.

Cr 1.

**MUO 113 Pep Band**

Prepares and performs band music appropriate for athletic events including current marching band selections. Attendance required at rehearsals and performances. May be repeated for credit. Prerequisite: Permission of director. Lab 2.

Cr 1.

**MUO 114 Symphonic Band**

Rehearses and performs the most challenging and significant band literature. Attendance required at rehearsals and performances. Occasional touring on class days. Membership by audition. May be repeated for credit. Lab 3.

Cr 1.

**MUO 121 University Orchestra**

Rehearsal and performance of standard orchestral repertoire. Membership through audition. Attendance at all rehearsals and public performances required. May be repeated for credit. Lab 4.

Cr 1.

**MUO 131 Chamber Singers**

The study and performance of chamber music for the voice. May be repeated for credit. Lab 2.

Cr 1.

**MUO 132 Opera Workshop**

Rehearsal and performance of standard opera repertory. Acceptance by audition. May be repeated for credit. Lab 3.

Cr 1.

**MUO 141 Brass Ensemble**

The study and performance of chamber music for brass instruments. May be repeated for credit. Lab 2.

Cr 1.

**MUO 142 Trombone Ensemble**

The study and performance of music for trombones. May be repeated for credit. Lab 2.

Cr 1.

**MUO 143 20th Century Music Ensemble**

Rehearsal and performance of 20th century music. Membership through audition. Atten-

dance at all rehearsals and performances required. May be repeated for credit. Lab 3.

Cr 1.

#### **MUO 145 Woodwind Ensemble**

The study and performance of chamber music for woodwind instruments. May be repeated for credit. Lab 2.

Cr 1.

#### **MUO 147 Horn Ensemble**

Rehearsal and performance of music written for french horns. May be repeated for credit. Prerequisite: Permission of instructor. Lab 2.

Cr 1.

#### **MUO 149 String Ensemble**

The study and performance of chamber music for string instruments. May be repeated for credit. Lab 2.

Cr 1.

#### **MUO 170 Karl Mellon Clarinet Choir**

Rehearsal and performance of music written for clarinet choir. May be repeated for credit. Prerequisite: Permission of instructor. Lab 2.

Cr 1.

#### **MUO 502 University Singers**

Performance of choral concert repertoire. Public performance and extended concert tours. Five rehearsals per week. May be repeated for credit. Prerequisite: audition.

Cr 1-2.

#### **MUO 503 Oratorio Society**

Participation and a leadership role in the rehearsal and performance of choral concert repertoire. Attendance at all rehearsals and public performances required. May be repeated for credit. Prerequisite: audition. Lab 2.

Cr 1-2.

#### **MUO 504 University Chorus**

Participation and a leadership role in the rehearsal and performance of choral music appropriate for choral singers with limited background and training. No audition required. Open to all students. Attendance at all rehearsals and public performances required. May be repeated for credit. Lab 2.

Cr 1-2.

#### **MUO 505 Marching Band**

Participation and a leadership role in the rehearsal and performance of marching band repertoire. Begins four days prior to opening of classes. Rehearses concert music on limited schedule during final weeks of semester. Attendance at all rehearsals and public performances required. May be repeated for credit. Prerequisite: permission. Lab 4.

Cr 1-2.

#### **MUO 506 Concert Band**

Participation and a leadership role in the rehearsal and performance of a variety of con-

certband literature appropriate for the general University instrumentalist. Attendance at all rehearsals and public performances required. Performs both on and off campus. May be repeated for credit. Prerequisite: permission. Lab 3.

Cr 1-2.

#### **MUO 507 Pep Band**

Participation and a leadership role in the rehearsal and performance of band music appropriate for athletic events including current marching band selections. Attendance at all rehearsals and public performances required. May be repeated for credit. Prerequisite: permission. Lab 2.

Cr 1-2.

#### **MUO 508 Symphonic Band**

Participation and a leadership role in the rehearsal and performance of the most challenging and significant band literature. Attendance at all rehearsals and public performances required. Occasional touring on class days. May be repeated for credit. Prerequisite: audition. Lab 3.

Cr 1-2.

#### **MUO 509 University Orchestra**

Participation and a leadership role in the rehearsal and performance of standard orchestral repertoire. Attendance at all rehearsals and public performances required. May be repeated for credit. Prerequisite: audition. Lab 4.

Cr 1-2.

#### **MUO 510 Chamber Singers**

Participation and a leadership role in the study and performance of chamber music for the voice. May be repeated for credit. Lab 2.

Cr 1-2.

#### **MUO 511 Opera Workshop**

Participation and a leadership role in the study and performance of standard opera repertory. May be repeated for credit. Prerequisite: audition. Lab 3.

Cr 1-2.

#### **MUO 512 Brass Ensemble**

Participation and a leadership role in the study and performance of chamber music for brass instruments. May be repeated for credit. Lab 2.

Cr 1-2.

#### **MUO 513 Trombone Ensemble**

Participation and a leadership role in the study and performance of music for trombones. May be repeated for credit. Lab 2.

Cr 1-2.

#### **MUO 514 Twentieth Century Music Ensemble**

Participation and a leadership role in the rehearsal and performance of 20th century

music. Attendance at all rehearsals and public performances required. May be repeated for credit. Permission: audition. Lab 5. Cr 1-2.

#### **MUO 515 Woodwind Ensemble**

Participation and a leadership role in the study and performance of chamber music for woodwind instruments. May be repeated for credit. Lab 2. Cr 1-2.

#### **MUO 516 String Ensemble**

Participation and a leadership role in the study and performance of chamber music for string instruments. May be repeated for credit. Lab 2. Cr 1-2.

#### **MUO 517 Karl Mellon Clarinet Choir**

Participation and a leadership role in the rehearsal and performance of music written for clarinet choir. May be repeated for credit. Lab 2. Cr 1-2.

#### **MUO 518 Percussion Ensemble**

Participation and a leadership role in the rehearsal and performance of percussion ensemble repertoire. Attendance at all rehearsals required. May be repeated for credit. Lab 2. Cr 1-2.

#### **MUO 519 Horn Ensemble**

Participation and a leadership role in the study and performance of music for french horn. May be repeated for credit. Lab 2. Cr 1.

### **Courses in Performance Techniques**

#### **MUP 205 Piano Class I**

Designed to give a basic command of the keyboard. Recommended especially for students preparing to take the proficiency examination in secondary piano. May be taken as an introduction to piano performance for the beginning student. Prerequisite: Music majors only. Lab 2. Cr 1.

#### **MUP 206 Piano Class II**

Designed to give a basic command of the keyboard. Recommended especially for students preparing to take the proficiency examination in secondary piano. May be taken as an introduction to piano performance for the beginning student. Prerequisite: Music majors only. Lab 2. Cr 1.

#### **MUP 215 Piano Class I**

A continuation of MUP 205, 206 designed to complete the proficiency examination in secondary piano. Prerequisite: MUP 205, 206 or permission of the instructor. Music majors only. Lab 2. Cr 1.

#### **MUP 216 Piano Class II**

A continuation of MUP 205, 206 designed to complete the proficiency examination in secondary piano. Prerequisite: MUP 205, 206 or permission of the instructor. Music majors only. Lab 2. Cr 1.

#### **MUP 220 Masterclass**

Supplements work done in private lessons and emphasizes the importance of preparing correctly to perform by providing frequent chances to do so, for students in the same studio. Open to all students studying that instrument or voice with a music department faculty member through the university for credit. Offered at the discretion of the studio teacher or permission of the instructor. Not for beginners. Cr 1.

#### **MUP 251 Accompanying I**

Fulfilled through accompanying students in lessons and recital or as accompanist for major performing organization. Required of all piano majors. Lab 2. Cr 1.

#### **MUP 252 Accompanying II**

Fulfilled through accompanying students in lessons and recital or as accompanist for major performing organization. Required of all piano majors. Lab 2. Cr 1.

#### **MUP 340 Basic Conducting**

Conducting techniques; emphasis on practical application to vocal and instrumental groups. Prerequisite: MUY 212. Lab 3. Cr 2.

#### **MUP 341 Choral Conducting and Literature**

Basic choral conducting and study of problems in the organization and training of choral groups. Prerequisite: MUP 340. Cr 3.

#### **MUP 345 Instrumental Conducting and Literature**

Basic instrumental conducting, and study of problems in the organization and training of bands and orchestras. Prerequisite: MUP 340. Cr 3.

#### **MUP 401 Performance-Secondary Instrument I**

Applied study in voice, keyboard, strings, winds and percussion instruments as a secondary applied area for the graduate student. May be repeated for credit. Prerequisite: Consent of advisor and instructor. (Lab fee of \$180.). Cr 2.

#### **MUP 402 Performance-Secondary Instrument II**

Applied study in voice, keyboard, strings, winds, and percussion instruments as a sec-

ondary applied area for the graduate student. May be repeated for credit. Prerequisite: Consent of advisor. (Lab fee of \$180.). Cr 2.

#### **MUP 405 Keyboard Musicianship I**

A comprehensive application of the study of harmony to the keyboard, directed towards the development of sight-reading and accompanying skills, keyboard score-reading, transposition, harmonization at sight, improvisation and the realization of figured bass or other chording schemes. Prerequisite: MUY 212, MUY 214, MUP 216 or equivalent level, including completion of Piano Proficiency requirements. Cr 2.

#### **MUP 406 Keyboard Musicianship II**

A comprehensive application of the study of harmony to the keyboard, directed towards the development of sight-reading and accompanying skills, keyboard score-reading, transposition, harmonization at sight, improvisation and the realization of figured bass or other chording schemes. Prerequisite: MUY 212, MUY 214, MUP 216 or equivalent level, including completion of Piano Proficiency requirements. Cr 2.

#### **MUP 511 Advanced Chamber Music I**

The study and performance of the standard ensemble literature for string instruments, wind instruments, and piano. Prerequisite: Permission. Cr 2.

#### **MUP 512 Advanced Chamber Music II**

The study and performance of the standard ensemble literature for string instruments, wind instruments, and piano. Prerequisite: Permission. Cr 2.

#### **MUP 530 Advanced Choral Conducting**

Applied choral conducting in laboratory setting. Works conducted will be selected from the Renaissance through the present. Prerequisite: MUP 341 or equivalent. Cr 3.

#### **MUP 540 Advanced Instrumental Conducting**

Survey of literature for symphonic, concert, and marching bands. A study of performance problems and conducting techniques as related to these ensembles. Prerequisite: MUP 345 or equivalent. Cr 3.

### **Special Courses in Music**

#### **MUS 100 Recital Lab**

Experience in recital performance and in listening to performances of one's peers. May be re-

peated. Required of music majors enrolled in applied music. Lab 1. Cr 0.

#### **MUS 121 Principles of Singing I**

Voice class required for freshman voice majors in the B. M. Ed. and B. M. Performance degrees. Emphasis on diction in the standard languages (French, German, Italian and English) with an introduction to the international phonetic alphabet and to classical literature, technique and performance practice. Weekly private instruction arranged through the class. Open to others by permission of the instructor. Cr 3.

#### **MUS 122 Principles of Singing II**

Voice class required for freshman voice majors in the B. M. Ed. and B. M. Performance degrees. Emphasis on diction in the standard languages (French, German, Italian and English) with an introduction to the international phonetic alphabet and to classical literature, technique and performance practice. Weekly private instruction arranged through the class. Open to others by permission of the instructor. Cr 3.

#### **MUS 298 Special Subjects in Music**

The special subjects to be studied and the method of approaching it will be chosen jointly by interested students and the staff. This offering is designed to address advanced issues not covered in regular offerings. 01-Italian Diction; 02-French Diction; 03-German Diction; 04-Harpichord; 05-Percussion Ensemble; 06-Individual Performance Practice; 07-Popular Music; 08-Applied Music, Special Study; 09-Electronic Music Composition; 10-Experimental Music, 11-Singing for the Musical Theatre; 12-Introduction to Music Therapy; 13-Piano Class for Non-Majors; 14-Field Practicum in Music Education; 16-Applied Classroom Instruments; 17-Choral Conducting; 18-Music Education Project; 20-Studies in European Culture; 22-Diction for Singers. Prerequisite: permission. Cr 1-3.

#### **MUS 498 Senior Project**

A research paper, original composition, or by special permission, a lecture-recital presented in lieu of a recital. Required of all music majors in the Bachelor of Arts degree program. Accomplished under the guidance of an assigned faculty member during the senior year. Cr 1.

#### **MUS 510 Special Subjects in Music**

The special subjects to be studied and the method of approaching it will be chosen jointly by interested students and the staff. This offering is designed to address the undergraduate course issues not covered in regular offerings.

01-Piano Pedagogy and Literature; 02-Foundations in Suzuki Pedagogy; 03-Seminar in Marching Band Techniques; 04-Fundamentals of Instrumental Pedagogy; 06-Seminar in Contemporary Music; 07-Literature for Two Pianos/Four Hands; 08-Chamber Music; 09-Vocal Pedagogy; 11-Harpsichord; 13-Analytical Survey of Music of Charles Ives; 14-Set-theory and Application; 15-Canon and Fugue Prerequisite: Permission. **Cr 1-3.**

### **MUS 590 Musical Perception**

Perception of musical relations in their bearing on the theory, history aesthetics, performance and learning aspects of music. **Cr 3.**

## **Courses in Theory**

### **MUY 101 Fundamentals of Music**

An elemental study of the dimensions and basic characteristics of musical sounds, with primary emphasis upon the development of skills and concepts through creating, performing and analyzation. For the general student. **Cr 3.**

### **MUY 102 Fundamentals of Music (Advanced)**

A continuation of MUY 101 with emphasis on more advanced aspects of rhythm, melody and harmony in music. For the general student. Prerequisite: MUY 101 or equivalent. **Cr 3.**

### **MUY 111 Elementary Harmony I**

Diatonic chordal relationships through written work, analysis, and keyboard application. Primarily for music majors. Prerequisites: MUY 101 or permission. **Cr 2.**

### **MUY 112 Elementary Harmony II**

Diatonic chordal relationships through written work, analysis, and keyboard application. Primarily for music majors. Prerequisite: MUY 111. **Cr 2.**

### **MUY 113 Elementary Sight Singing and Ear Training I**

Sight singing, ear training and dictation. To be taken concurrently with MUY 111. Prerequisite: MUY 101 or permission. Lab 3. **Cr 2.**

### **MUY 114 Elementary Sight Singing and Ear Training II**

Sight singing, ear training and dictation. Lab 3. Prerequisite: MUY 113. **Cr 2.**

### **MUY 211 Advanced Harmony I**

A continuation of MUY 112. Chromatic chordal relationships and 20th century harmonic practice. Prerequisite: MUY 112. **Cr 2.**

### **MUY 212 Advanced Harmony II**

A continuation of MUY 112. Chromatic chordal relationships and 20th century harmonic practice. Prerequisite: MUY 211. **Cr 2.**

### **MUY 213 Advanced Sight Singing and Ear Training I**

A continuation of MUY 114. Prerequisite: MUY 114. Lab 3. **Cr 2.**

### **MUY 214 Advanced Sight Singing and Ear Training II**

A continuation of MUY 114. Prerequisite: MUY 213. Lab 3. **Cr 2.**

### **MUY 315 Twentieth Century Musical Techniques**

Techniques for structural analysis of post-impressionist through contemporary music. Prerequisite: MUY 212 or permission. **Cr 2.**

### **MUY 422 Tonal Counterpoint**

Contrapuntal techniques as practiced by composers of the 18th and 19th centuries. Written exercises and analysis. Prerequisite: MUY 112 or permission. **Cr 2.**

### **MUY 451 Analytical Orchestration I**

The practical application of harmonic and structural analysis of musical forms as concerned with orchestral and band instrumentation and reductions. Prerequisite: MUY 212. **Cr 3.**

### **MUY 452 Analytical Orchestration II**

The practical application of harmonic and structural analysis of musical forms as concerned with orchestral and band instrumentation and reductions. Prerequisite: MUY 212. **Cr 3.**

### **MUY 461 Composition I (Small Forms)**

Composition in the Variation Forms, including ostinato, ground motive, passacaglia, chaconne and theme with variations. Prerequisite: MUY 451, MUY 452 or permission. **Cr 2.**

### **MUY 462 Composition II (Large Forms)**

Composition in the Song Forms, including AB, ABA, song form with trio, the rondo forms and a setting for voice. Prerequisite: MUY 461. **Cr 2.**

## Theatre/Dance

### Theatre

Professors Cyrus (Chairperson), Wilkinson; Associate Professor Snider; Assistant Professors Hardy, Merritt, Mikotowicz,

The major in Theatre leads to a B. A. degree in Theatre. In addition to the general major, one may develop a concentration in (1) Acting; (2) Directing; (3) Design and Technical Production; (4) Literature, history and criticism; or (5) Dance. Specific requirements for the degree and concentrations are available at the office of the Department of Theatre/Dance, Alumni Hall.

All majors are expected to participate in the many laboratory and performance activities offered by the major, the studio productions of the Maine Masque Theatre, and in the activities of the Dance Division.

The Department of Theatre/Dance offers the Master of Arts degree. Students may apply for the Creative Thesis as well as the traditional thesis. Further details may be found in the Graduate School Catalog.

The Theatre Program (Maine Masque Theatre) presents four major productions each year, as well as numerous laboratory and student-directed productions. We use two facilities for training and laboratory work: a 600-seat proscenium thrust theatre, and a 150-seat 3/4-round theatre. All students in the University are eligible to try out for, and participate in all aspects of the Theatre Program.

### Courses in Theatre

#### THE 111 Introduction to Theatre

The nature of the theatre medium, its basic elements and techniques. Emphasis on the principles that underlie theatre practice and the process by which plays are translated into theatrical expression. For the general student as well as prospective theatre majors. Cr 3.

#### THE 112 Masterpieces of World Drama I

Greek drama through 16th century tudor. World drama as literature and as theatre. Stress on dramatic form and content, and on the uniqueness of the drama to reflect the philosophical, social, and political environment. Fall semester. Cr 3.

#### THE 113 Masterpieces of World Drama II

French, Spanish, Italian and English drama, 16th through 19th century. World drama as literature and as theatre. Stress on dramatic form and content, and on the uniqueness of the drama to reflect the philosophical, social, and political environment. Spring Semester. Cr 3.

#### THE 116 Play Production

The responsibilities of the director in the basic principles of stage directing, including choosing and analyzing plays, scheduling rehearsals, blocking action, and determining stage business. Backstage work on major and laboratory theatre production is recommended. Lec 3.

Cr 3.

#### THE 117 Fundamentals of Acting

The basic skills of acting, including the actor's internal preparation for playing a role and the developing of his external techniques for projecting the role to an audience. Lec 2, Lab 2.

Cr 3.

#### THE 118 Stage Makeup

Study of principles and techniques of stage makeup. Practical application in class, production, experience opportunities. (Will not fulfill the Arts and Sciences Humanities requirement.)

Cr 3.

#### THE 201 Fundamentals of Characterization

Intermediate level studies in scene analysis and performance of modern theatre. This is primarily a studio course devoted to helping student actors develop a methodology and technique for analyzing and performing roles from the modern theatre repertoire. Prerequisite: THE 117 or permission.

Cr 3.

#### THE 214 Stagecraft (Technical Theatre Practice)

Introduction to practice in the practical aspects of technical theatre: scenery construction and painting, properties, costuming, lighting and sound. Emphasis on procedures and technique. Shop hours required in addition to lectures and readings. (Will not satisfy the Humanities distribution requirement for the B. A. degree).

Cr 3.

#### THE 214L Stagecraft I Laboratory

Stagecraft Lab will provide the student with the opportunity to apply the skills and

processes discussed in Stagecraft. Students will complete assignments that exhibit an understanding of the lecture material and engage in active participation with the departmental production program. This course is a requirement for majors and strongly recommended to non-majors. Corequisite: THE 214. Cr 1.

**THE 215 Stagecraft (A Scenographic Approach to Design)**

Philosophy and methodology of design in terms of a unified production approach. Prerequisite: THE 214 or permission. Cr 3.

**THE 215L Stagecraft II Laboratory**

Stagecraft Lab will provide the student with the opportunity to apply the skills and processes discussed in Stagecraft. Students will complete assignments that exhibit an understanding of the lecture material and engage in active participation with the departmental production program. This course is a requirement for majors and strongly recommended to non-majors. Corequisite: THE 215. Cr 1.

**THE 265 Costume I**

Apparel survey from ancient civilizations to present day, with accompanying design projects. Cr 3.

**THE 268 Theatre Practicum, Technical**

Supervised experience in the Theatre Division productions in the areas of stage managing, publicity, scenery, lighting, and costumes. Prerequisite: 6 hours of theatre courses and permission of instructor. May be repeated for a maximum of six hours. Cr 1-3.

**THE 269 Theatre Practicum in Acting**

Laboratory work in acting, credit assigned contractually by agreement of advisor and show director, based on learning opportunities of role in which student is cast. Prerequisite: 6 hrs of Theatre courses and permission of chairperson. May be repeated for a maximum of three hours. Cr 1-3.

**THE 400 Voice and Speech for the Actor**

A studio course in the principles and development of the actor's voice and speech. Cr 3.

**THE 402 Movement Training for Actors**

A study of methods of acting based on non-naturalistic approaches, which may include mime, puppetry, mask work, circus and clown techniques, guerrilla, environmental or street theatre, choral and sound expression or other appropriate topics. Prerequisite: THE 117, DAN 101. Cr 3.

**THE 403 Styles and Techniques of Acting**

The course will concentrate on technical problems in acting, such as verse, non-modern language, historical styles and theatre conventions, thru lectures, discussion, performance assignments, and exercises. Prerequisite: THE 117, THE 201. Juniors and Seniors. Cr 3.

**THE 419 Advanced Theatre Technology**

Detailed examination of techniques, materials and methodology for scenery and lighting. Preparation for professional work. Prerequisite THE 214, THE 215. Not offered every year. Cr 3.

**THE 430 Children's Theatre Production**

Members of the class will produce and perform plays for young children, (at several area parks). They will have hands-on experience with set and costume design and construction, acting, directing, writing, and stage management. Students will be exposed to the creative process that is intrinsic to teaching and working in children's theatre. Prerequisite: THE 116 or permission. Cr 3.

**THE 440 Playwriting, Directing and Performing Lab**

Providing a matrix for playwriting, directing, and performing, this course is a laboratory in which students can work on a wide variety of original projects. Each student will have the opportunity to create a traditional script or a non-traditional performance piece. Projects will be written, analyzed, rewritten, directed, and performed by members of the class. There will be a final showcase of projects. Prerequisite: THE 116 or permission. Cr 3.

**THE 461 Theatre History I**

The development of the drama, physical theatre, and modes of production. Fall semester: Greek theatre through the Renaissance. Limited to juniors and seniors. Cr 3.

**THE 462 Theatre History II**

The development of the drama, physical theatre, and modes of production. Spring semester: Restoration to the present day. Limited to juniors and seniors. Cr 3.

**THE 463 Scene Designing**

Principles, methods, and materials used in scene designing. Laboratory projects in preparing the complete design for a particular production, including drawing and plans. Prerequisite: THE 214 and THE 215. Cr 3.



**THE 464 Stage Lighting**

Principles, methods, and materials used in stage lighting, including their artistic and technical applications. Projects include problems in lighting particular productions. Shop work required. Prerequisite: THE 214 and THE 215.

Cr 3.

**THE 465 Costume II**

Principles, methods and materials used in creating costumes for the stage. Emphasis on drafting and construction with an introduction to specialized construction such as mask making.

Cr 3.

**THE 466 Stage Directing**

The translation of all aspects of the theatre production into an artistic unity. Emphasis on theatre aesthetics. Practice in the directing of short plays, with particular attention to the director's work with the actor. Prerequisite: THE 116. Limited to juniors and seniors. Lec 2, Lab 2.

Cr 3.

**THE 468 Theatre Management**

Principles and practices in selecting and selling a season, in running the box office, in budgeting, in graphic arts production, in advertising and publicity in the media, in audience development and public relations. Prerequisite: THE 111 and permission. (Alternate years).

Cr 3.

**THE 497 Independent Study in Theatre I**

Cr 1-3.

**THE 498 Independent Study in Theatre II**

Cr 1-3.

**THE 560 Directing of Pre-Modern Drama**

Examines theories, methods, and problems in directing pre-modern dramas, from Aeschylus to Ibsen. Each student directs some aspect(s) of a pre-modern play. Prerequisite: Stage Directing or permission.

Cr 3.

**THE 561 Directing of Modern Drama**

Examines theories, methods and problems in directing modern dramas, from Ibsen to the present day. Each student directs some aspect(s) of a modern play. Prerequisite: Stage Directing or permission.

Cr 3.

**THE 563 American Theatre**

A study of the development of the American Theatre from its beginning to the present day. Prerequisite: permission.

Cr 3.

**THE 564 Asian Theatre**

A study of the traditional theatres of China and Japan, with emphasis on the classical Peking

Opera, Japanese Noh, Kabuki and Bunraku and the successive composites of these with Western forms. Prerequisite: permission. (Not offered every year).

Cr 3.

**THE 565 Dramatic Theory**

An analysis of major theories of dramatic writing and dramatic production from Aristotle to the present day, with consideration of their influence on the theatre and drama. Prerequisite: THE 461, 462 or permission.

Cr 3.

**THE 567 Drama Colloquium**

Study, in depth, of a play presented by the Maine Masque Theatre during the semester in which the colloquium is offered, and examination of selected works by the author. Participation in the production required. Prerequisite: permission.

Cr 3.

**THE 574 Aesthetics of Modern Scene Design**

Approaches to modern scene design, using intensive practice in rendering and visual design techniques as well as the study of techniques and theories of modern scenic designers. Prerequisites: THE 214, THE 215 and THE 463 or acceptable portfolio.

Cr 3.

**THE 596 Field Services in Theatre Production**

Experience in producing theatre in the field, through stage directing, designing scenery and/or lighting, building scenery, stage managing, costuming, handling publicity, etc. within a local elementary or secondary school, community or professional theatre. Prerequisite: Senior theatre majors and Graduate students with permission of the Coordinator. Credit depends on length and complexity of assignment.

Cr 1-3.

**Courses in Dance****DAN 101 Beginner Modern Dance**

Fundamental concepts and practice of dance technique: body alignment, stretch/strengthening, movement vocabulary, body coordination, musicality and spatial awareness. For the general student at the beginning dance level.

Cr 2.

**DAN 102 Beginner Ballet**

An introduction to classical dance training. Traditional exercises at the barre and on center floor emphasize body placement, flow of energy, and the creation of expressive movement in space. As a tool for the performing artist or general student, technique is geared to

finding the physical freedom made possible within the discipline. **Cr 2.**

#### **DAN 103 Beginner Jazz**

Fundamentals of jazz dance technique. Emphasis on body alignment, coordination and movement vocabulary, preparing the student for an awareness of freedom of expressive movement in relation to modern jazz music.

**Cr 2.**

#### **DAN 104 Beginner Flamenco**

Fundamentals of movement as a basis for various aspects of dance: strength, control, rhythmic awareness and coordination. Elements of the cultural underpinning of Flamenco style will be explored while the student learns the basics of dance--the appropriate focal points for a dancer and freedom of movement.

**Cr 2.**

#### **DAN 112 Dance Workshop**

Dance performance with emphasis on professional repertory, costuming, lighting in relation to choreography, staging mechanisms and needs for the dance, rehearsals and public concerts. A limited tour will be scheduled during the spring semester. Attendance at all rehearsals and public performances required. May be repeated for credit. Membership through audition or previous participation.

**Cr 1.**

#### **DAN 201 Intermediate Modern Dance**

Continuation of techniques in DAN 101, with an emphasis on solving more complex movement problems within a context of space time and force. An enhanced movement vocabulary and further principles of body alignment, stretch/strengthening and musicality will be explored. May be repeated for credit. Prerequisite: DAN 101 or permission of instructor.

**Cr 2-3.**

#### **DAN 202 Intermediate Ballet**

A detailed study of ballet form for the student with some previous training. Steadily mastering the execution of exercises and steps with speed, clarity and grace brings a fuller kinesthetic awareness that can be used as a base for professional training or general artistic enrichment. May be repeated for credit. Prerequisite: DAN 102 or permission.

**Cr 2-3.**

#### **DAN 203 Intermediate Jazz**

A continuation of DAN 103 (Beginning Jazz). Further development of principles of movement within the Jazz idiom: body alignment, musicality, phrasing, stylistic form and performance awareness. Repeatable with permis-

sion for credit. Prerequisite: DAN 103 or permission. **Cr 2.**

#### **DAN 204 Intermediate Flamenco**

Development of movement principles established in DAN 104 (Beginning Flamenco). An emphasis is placed on the development of performance quality. Students are encouraged to simply enjoy the stimulation of this cultural experience; career opportunities are discussed. Repeatable with permission for credit. Prerequisite: DAN 104 or permission. **Cr 2.**

#### **DAN 250 Dance Composition I**

Study of the principles and elements of choreography. Guided practice in the construction of movement phrases, followed by longer studies for solo and group dances. This course will consist of student studies and compositions exploring phrasing, timing, and rhythm, space, shape, design and form; dynamics and emotional content in theater dance. The contribution of music, props, costumes, lighting and makeup to the total effect of a dance will be analyzed in relation to student works. An informal studio presentation of student pieces will evolve out of this course. Prerequisite: Prior dance experience or permission of instructor. **Cr 3.**

#### **DAN 266 Dance History**

Religious, social and cultural aspects of dance from primitive ritual to the present century. No prerequisite. **Cr 3.**

#### **DAN 268 Elementary Dance Notation (Labanotation)**

Analysis of directions, levels, timing and dynamics of movement. Notation fundamentals (Labanotation), elementary notation of dance technique, reading of folk dances and simple modern dance and ballet studies. Prerequisite: DAN 101, DAN 104, DAN 102 or DAN 103, DAN 253, or DAN 263 or previous dance experience. **Cr 3.**

#### **DAN 301 Advanced Modern Dance**

A development of principles established in DAN 201. Emphasis on performance quality, phrasing, musicality, and choreographic retention. An opportunity is provided for the advanced dancer to develop his/her personal style and to expand his/her movement vocabulary. May be repeated for credit. Prerequisite: DAN 201 or permission. **Cr 2-3.**

#### **DAN 302 Advanced Ballet**

A development of principles of balletic style established in DAN 202. Emphasis on perform-

ance quality, an expansion of balletic vocabulary and choreographic retention. May be repeated for credit. Prerequisite: DAN 202 or permission. Cr 2-3.

#### **DAN 303 Advanced Jazz**

A continuation of technical and stylistic principles established in DAN 201. Further emphasis on musicality, movement vocabulary and phrasing of advanced floor combinations. Repeatable with permission for credit. Prerequisite: DAN 201 or permission. Cr 2.

#### **DAN 304 Advanced Flamenco**

Working on a professional level, the students mastery of this ethnic dance form is broadened by an in depth study of the folk dancing, customs and traditions of Spain's 49 regions, costumes, instruments and the influence of Greek, Jewish, and Arabic elements on the Flamenco and Classical Spanish dances. Repeatable with permission for credit. Prerequisite: DAN 204 or permission. Cr 2.

#### **DAN 375 Dance in the Twentieth Century**

An analysis of the changes and growth of the dance in the 20th century with specific attention to ballet and American Modern Dance and including The Popular Dance: Social Stage and

Cinema. Dance developments related to concurrent achievements in 20th century art, music, psychology, literature, architecture, education and the theatre. This is a writing experience class. Prerequisite: DAN 266 or permission. Cr 3.

#### **DAN 398 Dance Project**

For the Intermediate level student who wishes to work on a special project in jazz, flamenco, ballet or modern dance. The special project may be teaching, choreography, repertory, research, and/or technique designed by the student and instructor to give the student more independent responsibility within the class structure and an opportunity to expand his or her academic and/or technical proficiency. Prerequisite: Intermediate level technique or permission. Cr 2.

#### **DAN 498 Dance Project/Thesis**

A supervised practicum in choreographic process and/or performance and a written analysis of this practicum or, alternately, an advanced level research topic, designed jointly by the student and the instructor. Prerequisite: Advanced level technique or permission. Cr 3.

## **Philosophy**

Professors Skorpen (Chair), Allen, White; Associate Professors Howard, Sawicki; Assistant Professor Halford

Philosophy is rigorous reflection on human nature, culture, and the world. It is analytic in clarifying the concepts and methods particular to the humanities and to the sciences. It is synthetic in interpreting the descriptive and evaluative findings of all branches of human inquiry, including its own. It is also essential to the development of professional, occupational, environmental, and applied ethics elsewhere.

### **The Humanities Requirement**

The majority of courses taken in Philosophy may be used toward fulfilling the Arts and Humanities distribution requirement for the B. A. degree. Philosophy courses open without prerequisite are: PHI 101, History and Problem of Self-Understanding in Philosophy; PHI 102,

Philosophy and Modern Life; PHI 103, Methods of Reasoning; PHI 105, Introduction to Religious Studies; PHI 106, Social Issues in Recent Religious and Philosophical Thought; PHI 107, Existentialism; PHI 108, Biblical Thought; PHI 410, History of Ancient Philosophy; PHI 412, History of Modern Philosophy; PHI 430, Ethics; PHI 440, Philosophical Foundations of Social and Political Institutions: Plato to Machiavelli; PHI 450, Logic I; PHI 482, The New Testament and Early Christianity; PHI 486, Religions and Philosophies of the East: Hinduism; and PHI 487, Religions and Philosophies of the East: Buddhism. Other courses in the department carry prerequisites, usually three or six hours in philosophy.

### **Philosophy Major**

Requirements for the Philosophy major are:  
1. A minimum of 27 hours in philosophy;

2. At least 18 hours (six courses) in philosophy must be upper level courses, i. e. , courses above the 100 level;
3. Six hours in the History of Philosophy sequence (PHI 410-PHI 422), including PHI 410;
4. One three-hour course specifically designated as "Seminar for Philosophy Majors."

The department encourages double majors. We recognize that requirements of other departments may make it difficult or impossible for a student to complete a double major, especially when the decision for this comes late in a student's undergraduate career. Accordingly, the department will accept petitions for the waiver of any of the above requirements. Each petition will be assessed individually.

### Concentration in Religious Studies

The concentration in religious studies is designed to provide students with the critical tools and scholarly background required for an informed understanding of the influential traditions of religion that have developed in human culture.

Students graduating with a Concentration in Religious Studies will fulfill the departmental requirements as well as: 1) PHI 108; 2) either PHI 486 or PHI 487; 3) one of the following upper-level courses: 481, 485, 489, 490.

### Courses in Philosophy

#### **PHI 101 History and Problem of Human Self-Understanding in Philosophy**

An introductory historical analysis of major theories of self-understanding from pre-history to the present. Readings include Lorenz, Plato, Kant and others. Lectures are supplemented by film presentations such as Clark's "Civilization."

Cr 3.

#### **PHI 102 Philosophy and Modern Life**

Contemporary works such as Foucault's *Discipline and Punishment* and deBeauvoir's *The*

notion of arguments, informal fallacies, purposes and types of definition, deduction and induction. Emphasis is given to understanding and mastering (through practice including computer assisted instruction) some fundamental techniques for testing the soundness of many different kinds of reasoning including the student's own.

Cr 3.

#### **PHI 105 Introduction to Religious Studies**

An analysis of religion as an expression of human culture past and present. Subjects considered are: institutional and non-institutional manifestations of religion as conveyed through myth and symbol, religious experience, struggle for societal change, mysticism, and quests for the articulation of human values. Inquiry by various disciplines will be considered, e. g. , anthropology, psychology, sociology, history, philosophy, and theology.

Cr 3.

#### **PHI 106 Social Issues in Recent Religious and Philosophical Thought**

An examination of various philosophical and religious treatments of the most relevant social issues of our time. This course considers analyses of such issues as sexism, racism, imperialism, violence and nonviolence, integration and separatism, capitalism and socialism.

Cr 3.

#### **PHI 107 Existentialism**

A critical study of the philosophical significance of individual choices and actions, involving questions of personal identity, responsibility and authenticity, and the possibility or desirability of "disinterested objectivity." Authors read include Kierkegaard, Heidegger and Sartre.

Cr 3.

#### **PHI 108 Biblical Thought**

A critical examination of the historical, literary and theological development of the Biblical tradition from the time of its Hebraic origins to Jesus of Nazareth.

Cr 3.

#### **PHI 260 Philosophy of Language**

A study of major contemporary theories of lan-

**PHI 411 Medieval Philosophy**

A study of the principle developments of Western thought from the Hellenistic era to the fourteenth century: Neo-Platonism, Augustine, Medieval scholasticism, the Thomist synthesis and its aftermath. Prerequisite: one course in philosophy or permission of instructor. Cr 3.

**PHI 412 History of Modern Philosophy**

An interpretation of modern philosophy beginning with Bacon and Descartes in the 17th century, developing through rationalism and empiricism during the 18th century and culminating in the system of Kant. Cr 3.

**PHI 413 Nineteenth Century Philosophy**

A critical study of the major thinkers of the nineteenth century. Particular attention will be directed to Hegel, Feuerbach, Marx, and Nietzsche. Kant, Kierkegaard, and Dilthey will also be considered. Prerequisite: one course in philosophy (PHI 412 recommended). Cr 3.

**PHI 420 Recent Continental Philosophy**

A critical study of some of the major movements and thinkers in continental philosophy since the turn of the century. Readings include works by such thinkers as Husserl, Heidegger, Sartre, Merleau-Ponty, Levi-Strauss, Derrida, Foucault, Habermas, and Gadamer. Prerequisite: one course in philosophy. Cr 3.

**PHI 421 American Philosophy**

A brief examination of colonial and early 19th-century American contributions to the development of present-day philosophy. Particular emphasis is given to the philosophical views of Royce, Peirce, James, Dewey and Santayana. Prerequisite: one course in philosophy. Cr 3.

**PHI 422 Philosophical Classics**

An intensive study of the works of a major philosopher or school. This course is conducted as a seminar. May be repeated for credit when different philosophers or problems are studied. Cr 3.

**PHI 430 Ethics**

Readings and discussions of works by Mill, Kant, Nietzsche, Tillich, Dewey, and some other systematic moral philosophers. In each case, the nature of the system, its summum bonum and defense is examined, criticized, and tested for its applicability to personal and public ethical predicaments. Cr 3.

**PHI 435 Meta-ethics**

An analysis of particular concepts and issues in

traditional moral systems. These include the meanings of justice, equality, and happiness, and the nature of first principles, practice, and summary rules. Prerequisite: PHI 430 or one other course in philosophy or permission of instructor. Cr 3.

**PHI 439 Feminist Theory**

A survey of the major feminist theoretical frameworks with emphasis on their respective practical implications in the areas of work, family life, and sexuality. Prerequisite: Sophomore standing. (Area II, Above Introductory Level). Cr 3.

**PHI 440 Philosophical Foundations of Social and Political Institutions: Plato to Machiavelli**

A critical study of the development of social and political philosophy from Plato through Machiavelli in light of their ethical and metaphysical systems. Topics discussed include the problem of justice, the nature of the state and its relationship to other social institutions, and the individual. The primary focus will be on normative rather than descriptive theory. Cr 3.

**PHI 441 Philosophical Foundations of Social and Political Institutions: Hobbes to Marx**

A critical study of the development of social and political philosophy from Hobbes through Marx in light of their ethical and metaphysical systems. Topics include the problem of justice, the nature of the state and its relationship to social institutions, and the individual. The primary focus will be on normative rather than descriptive theory. Cr 3.

**PHI 442 Marxist Philosophy: From Marx to Mao**

An analysis of Marxist philosophy, with special attention to the Marxist theory of knowledge, ethics, political and social philosophy. Major focus is on the philosophy of Karl Marx, with considerable readings from Friedrich Engels and Mao Zedong. Prerequisite: one course in philosophy. Cr 3.

**PHI 443 Twentieth Century Marxist Philosophy**

An examination of major works in twentieth century Marxism. Emphasized are the writings of such thinkers as Lenin, Luxemburg, Lukacs, Trotsky, Mao, Gramsci, and Braverman. Prerequisite: PHI 442 or permission of instructor. Cr 3.

**PHI 444 Philosophy of Law I**

An introduction to legal philosophy. Topics include the nature of law, the limits of law, and legal responsibility. Special emphasis on the law of torts. Authors studied include Hart, Mill, Dworkin, Raz, and Feinberg among others. Cr 3.

**PHI 445 Philosophy of Law II**

An introduction to legal philosophy. Topics include the nature of justice and the problem of punishment. Special emphasis on contract law. Authors studied include Rawls, Posner, Mill, Dworkin, and Fried, among others. Cr 3.

**PHI 446 Philosophy of History**

A critical study of historical knowledge and its significance. Topics include the nature of historical facts, what counts as historical explanation, whether "objectivity" is possible in history, and whether there is progress in history. Idealist, empiricist, Marxist, and phenomenological approaches will be considered. Cr 3.

**PHI 450 Logic I**

An introductory course in modern symbolic logic. Techniques of deductive inference, including decision procedures and axiomatization, are studied in developing the propositional and predicative logics. Some attention is given to metalogic and the philosophy of logic. Cr 3.

**PHI 451 Logic II**

Advanced topics in symbolic logic. Prerequisite: PHI 450 or permission of instructor. Cr 3.

**PHI 452 Philosophy of Natural Science**

A critical study of scientific knowledge and how it is developed. Relations between theory and experiment, the scientist and the scientific community, and contemporary science and its historical background, will receive particular attention. Prerequisite: 6 hours of natural science or permission of instructor. Cr 3.

**PHI 453 Philosophy of Behavioral Science**

A critical examination of the conceptual foundations of modern behavioral science from behavioristic, ordinary language, and phenomenological standpoints. Among issues discussed are reinforcement versus role-rule explanations and the relevance of law-like regularities versus generative principles. Prerequisite: 6 hours of philosophy, behavioral science, or permission of instructor. Cr 3.

**PHI 461 Existentialism and Literature**

A critical study of the philosophical significance of individual choices and actions involving questions of personal identity, responsibility and authenticity as these themes are developed in existentialist literature. Special attention will be given to existentialist literary techniques. (Area II, Writing Experience, Above Introductory Level). Cr 3.

**PHI 462 Philosophy of Art**

An investigation of the nature and importance of aesthetic experience and its objects, of the possibility of standards of art and taste, and the relation of art to other areas of experience. Topics considered include art and morality, art and science, art and the environment. Readings from primary sources by Tolstoy, Hume, Dewey, Langer, Bell, Danto, Dickie and Beardsley, among others. Cr 3.

**PHI 463 Theory of Knowledge**

An examination of recent philosophical studies in epistemology. The last half of the course will apply the methods of modern philosophical analysis to some theory outside philosophy, e. g. , a theory in psychology, literature, biology or history, emphasizing the usefulness of philosophies of sensation, belief, truth, meaning, memory and imagination for theory construction. Cr 3.

**PHI 465 Topics in Philosophy**

Individual and small group study of problems or systems of philosophical concern. The course is a seminar relying on careful use of major philosophical resources, as well as attempts at fresh exploration of fundamental topics. May be repeated for credit when different philosophers or problems are studied. Prerequisite: permission of instructor. Cr 3.

**PHI 466 Readings in Philosophy**

Individual study of a selected topic, agreed upon by the student and the instructor. This offering is designed to address advanced issues not covered in normal offerings. Prerequisite: 9 hours and permission of department and instructor. Cr 1-3.

**PHI 481 The Nature of Religious Experience**

A study of different methodological approaches to religious experience, with primary emphasis on the phenomenology of religion. A major concern is a description of religious phenomena and an interpretation of their meaning by analyzing the nature of religious sym-

bolism. Prerequisite: one course in philosophy or permission of instructor. Cr 3.

**PHI 482 The New Testament and Early Christianity**

An examination of the growth of the New Testament in its religious, social, and philosophical context, and an historical-theological analysis of the cult of Christ from the second century to the fifth century councils. Special attention is given to primary theological texts.

Cr 3.

**PHI 483 The Reformation and the Enlightenment**

An analysis of theological developments from the sixteenth to the eighteenth century with special attention to Luther, Calvin, Erasmus, Pascal, and Jonathan Edwards. Prerequisite: one course in philosophy or permission of instructor.

Cr 3.

**PHI 485 Recent Religious Thought**

The major developments in Western theology from World War I to the present: Buber, Barth, Reinhold Niebuhr, Tillich, Bonhoeffer, Teilhard de Chardin as influences on current philosophical theology and modern understandings of humanity and society. Prerequisite: one course in religious thought or SOC 482.

Cr 3.

**PHI 486 Religions and Philosophies of the East: Hinduism**

The religious and philosophical foundations of

Hinduism. Readings include the Vedas, the Bhagavad-Gita, the Upanishads, Yoga, and Vedanta.

Cr 3.

**PHI 487 Religions and Philosophies of the East: Buddhism**

The religious and philosophical foundations of Buddhism: the basic teachings of the Buddha (Four Noble Truths, Noble Eightfold Path, Dependent Origination, etc.), Buddhist ethics, Buddhist meditation, and some later religious and philosophical developments.

Cr 3.

**PHI 489 Nature in Philosophy and Religion**

An examination of the meaning of nature and human involvement in nature from a theological and philosophical perspective as seen in major texts from the Classical, Hellenistic, Medieval, Enlightenment, and Modern periods. Prerequisite: one course in philosophy or permission of instructor.

Cr 3.

**PHI 490 Topics in Religious Studies**

Small class study of a theme, thinker or fundamental problem in religious thought. The course may be repeated for credit when different topics are considered. Prerequisite: permission of the instructor.

Cr 1-3.

**Interdisciplinary Course**

**INT 290 (PHI, PHY, ZOL) Nuclear War**

An introduction to the effects of nuclear war and related issues.

Cr 1.







# College of Applied Sciences and Agriculture

Wallace C. Dunham, *Dean*

The College of Applied Sciences and Agriculture specializes in programs in three fundamental areas:

Human Development

Economic Development of Natural Resources

Agricultural Biology

Within these areas degree programs are offered at all academic levels. Two-year programs leading to the Associate of Science degree in selected areas are offered through the Technical Division of Applied Sciences and Agriculture. Baccalaureate (4-year) programs leading to the Bachelor of Science degree are offered through the School of Human Development and six academic departments (Agricultural and Resource Economics, Agricultural Engineering, Animal and Veterinary Sciences, Entomology, Food Science, and Plant and Soil Sciences). Advanced degrees (Master of Science and Doctor of Philosophy) also are offered in a wide variety of disciplines.

The undergraduate programs of the college are designed to develop proficiency in a specific discipline or profession, and to provide broad experience in the social sciences and the humanities. The overall goal is to help students prepare for rewarding careers while at the same time providing access to courses which will broaden perspective and enhance the quality of life by developing an appreciation for the arts and humanities.

Students in all programs of study within the college enjoy the benefits of an advising program designed with their needs and interests foremost in mind. During the freshman year students meet weekly in small seminar classes with their academic advisor for the freshman year. Once the choice of a major is formalized (usually at the beginning of the sophomore year) a faculty member is assigned to serve as academic advisor for each student. This person, whose professional training complements the student's academic interests, helps with course selection and provides advice concerning career development. Throughout the un-

dergraduate years, the capabilities, aspirations, and goals of the student are the primary concerns governing the advising process.

Students may select a degree program upon entering the college. However, many delay a formal choice of major until the sophomore year. In addition to the major, students in the College of Applied Sciences and Agriculture have the option of selecting one of more than 20 minor areas of concentration. These optional minors range from such technical disciplines as chemistry, to humanities and social sciences. Choice of a minor enables students to strengthen their preparation in the major by selecting supporting courses from a related discipline, to prepare themselves in an alternative discipline, or to focus those credits they are required to earn in the humanities and social sciences.

## Baccalaureate Degree Programs

In the following list, baccalaureate degree (all are bachelor of science) programs of the college are grouped into broad disciplinary areas. Programs marked by an asterisk (\*) are offered cooperatively by two or more academic departments. The parentheses enclose the name of the academic unit responsible for administration of each program.

### Programs in Human Development

Human Nutrition and Foods (School of Human Development)

Child Development/Family Relations (School of Human Development)

Health and Family Life Education (School of Human Development)

### Programs in the Economic Development of Natural Resources

Agribusiness Administration (Department of Agricultural and Resource Economics and College of Business Administration)

Agribusiness and Resource Economics (Department of Agricultural and Resource Economics)

- Bio-Resource Engineering (Department of Bio-Resource Engineering)
- Food Science (Department of Food Science)
- Landscape Horticulture (Department of Plant and Soil Sciences)
- Merchandising and Consumer Resources (School of Human Development)
- Natural Resources (\*) with concentrations in natural history and ecology, marine resources and sciences, soil and water conservation, resource and environmental economics, land use planning, earth sciences, environmental history and social science perspectives, government and public policy, environmental entomology, waste management and individualized concentration.
- Production and Processing Technology (Department of Bio-Resource Engineering)
- Sustainable Agriculture (\*) with concentrations in sustainable agriculture, animal and veterinary science, agribusiness and resource economics, plant protection, plant science and soil science.

#### Programs in Agricultural Biology

- Animal Science (Department of Animal and Veterinary Sciences)
- Pre-Veterinary (Department of Animal and Veterinary Sciences)

#### Pre-Veterinary and Other Pre-Professional Programs

Pre-veterinary students in the college normally major in the pre-veterinary concentration of the program in animal sciences. Four of the faculty in Animal and Veterinary Sciences are veterinarians, assuring students of knowledgeable advisors. Besides preparing students academically for application to a college of veterinary medicine, the program also allows valuable experience in working with large domestic animals. This type of experience can be helpful in gaining admission to a veterinary college.

Students interested in pursuing a career as a registered dietician are advised to major in Human Nutrition and Foods at the undergraduate level. This program, which is approved by the American Dietetic Association, provides the background needed to pursue graduate studies in nutrition or to apply for admission to a certified internship program in dietetics.

All students contemplating careers in the

health professions are aided and advised by the University Health Professions Committee. The primary purpose of this committee and the programs it sponsors is to assist students in applying to professional schools. Among its many activities, the committee brings to campus deans and other administrators of medical and veterinary schools. These visits provide students first-hand information regarding the selection process followed by professional schools.

#### Associate Degree Programs

Through its Technical Division, the college offers associate degree programs in the following technical areas:

- Animal Medical Technology (Animal and Veterinary Sciences)
- Merchandising (School of Human Development)
- Landscape and Nursery Management (Plant and Soil Sciences)
- Resource and Business Management (Agricultural and Resource Economics) (two-plus-two)

Programs designated as two-plus-two are designed so that students completing the first two years with an accumulative grade point average of 2.5 or higher may transfer to the appropriate baccalaureate program and earn the B. S. degree after an additional two years of study.

#### Admission Requirements

##### Baccalaureate Programs

Students interested in the bachelor of science degree must submit scores on the College Entrance Examination Board Scholastic Aptitude Test (S. A. T.) with their application.

High school course requirements for admission to various professional areas of study are:

##### A. Applied Sciences

English	4 units
Algebra I and II	2 units
Plane Geometry	1 unit
Trigonometry (or its equivalent) (Bio-Resource Engineering only)	1/2 unit
Science (chemistry or physics preferred)	2 units
History/Social Science	1 unit
Academic Electives	<u>5 1/2-6 units</u>
TOTAL	16 units

B. School of Human Development	
English	4 units
Algebra I & II	2 units
Plane Geometry	1 unit
Science* (chemistry recommended)	1 unit
History/Social Science	1 unit
Academic Electives	7 units
TOTAL	16 units

### Associate Programs

Students entering two-year, associate of science programs must have graduated from high school or have received a GED certificate must have completed the C. E. E. B. Scholastic Aptitude Tests, and must possess a strong desire for a specific technical program. Two units of mathematics, one of which must be algebra, are required. Students who contemplate continuation in a regular four-year baccalaureate degree curriculum must first complete the two-year associate degree program at a grade point average of 2.5 or higher, and must satisfy entrance requirements to the desired baccalaureate degree program.

### Transfer Admission

Admission of transfer students is made by the University Admissions Office. Evaluation of records for transfer credits is made by the associate dean of the college with the aid of the appropriate school director or department chairperson. In general, degree credit is given for equivalent course work passed at a satisfactory level.

## Graduation Requirements

### Bachelor of Science Degree Candidates

Completion of course work required in the various programs of the College of Applied Sciences and Agriculture leads to a degree of bachelor of science. All students are required to

\*Chemistry required for majors in Human Nutrition and Foods, and Health and Family Life Education.

complete a minimum of 120 degree hours. Bio-Resource Engineering requires 131 credit hours.

In addition, each student must achieve an accumulative grade point average of 2.0 for all courses designated as "major" courses and an accumulative grade point average of 2.0 over all courses taken. The requirements for some programs may be higher for grades in "major" courses.

In addition to individual program requirements, all degree candidates must complete the following minimum degree requirements:

Communications	6
Writing course*	(3)
Speaking course**	(3)
Humanities and Social Sciences	15

Courses in the humanities and social sciences must be chosen to introduce students to literature, the arts, history, and current social issues. Academic advisors will assist with course selection.

TOTAL HOURS	21
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Physical education is not a requirement, but students may count up to two credits of physical education as electives.

### Associate of Science Degree Candidates

For the degree of associate of science, students must complete satisfactorily a prescribed technical curriculum with a minimum of 60 credit hours earned at an accumulative grade point average of at least 2.0.

\*Students selected for Freshman Honors are excused; students may receive degree credit through Advanced Placement. All others ordinarily will take ENG 101, College Composition, with possible substitution of ENG 212, Intermediate Composition, and ENG 317, Advanced Professional Exposition, or JBR 231, Reporting and Newswriting.

\*\*Students ordinarily will take SPC 103, Fundamentals of Public Communication. Possible substitutes, with permission of the associate dean, are SPC 245, Small Group Communication, SPC 247, Argumentation and Public Advocacy, or SPC 106, Oral Communication of Literature.

## Bachelor of Science in Agribusiness and Resource Economics

The B. S. in Agribusiness and Resource Economics is offered by the faculty of the Department of Agricultural and Resource Economics.

Three areas of concentration are available, Agribusiness Economics, Resource Economics, and Agribusiness Administration. Agribusiness Administration is a 5 year program jointly offered with the College of Business Administration. It is a unique opportunity to earn both a bachelor's degree in Agribusiness and Resource Economics and a Master's of Business Administration. The department's programs are designed to develop abilities to handle managerial responsibilities and make economic decisions in the food, fiber and other resource based sectors of the economy. The program provides a broad education in agricultural business, economics, resource economics, and community economic development.

Areas of instruction include the business and economic aspects of production, with emphasis on the economic use and management of capital, labor, and land resources; the business aspects of marketing, with emphasis on pricing, financing, merchandising, and consumption; and the economics related to development of area resources. Also stressed are the social and human factors associated with food production, processing, distribution, consumption, and community development. In addition, training is complemented by a comprehensive, integrated program of courses in the sciences, other social sciences, communications, arts, and humanities.

Employment opportunities exist in marketing, service, research, and management positions, with food, agricultural, and other such businesses as manufacturing and processing firms, wholesale and retail distribution firms, insurance and credit agencies, cooperatives, and feed, fertilizer, and other input supply companies. Those in the resource economics concentration find employment with conservation groups and state or federal agencies concerned with natural resource development or preservation, as well as with private sector firms which develop resource inventories and impact statements. Graduates also are frequently employed by federal and state governments, and by colleges and universities.

### Curriculum in Agribusiness and Resource Economics

#### Agribusiness Concentration

##### Basic Sciences

BIO 100 Basic Biology	4
Electives*	7
<b>TOTAL HOURS</b>	<b>11</b>

##### Communications

ENG 101 College Composition	3
SPC 103 Fundamentals of Public Communication	3
<b>TOTAL HOURS</b>	<b>6</b>

##### Humanities and Social Sciences

ENG 317 Advanced Professional Exposition	3
INT 324 Sociology of Rural Life	3
Electives**	9
<b>TOTAL HOURS</b>	<b>15</b>

##### Mathematics and Statistics

MAT 113/114 Mathematics for Business and Economics I/II	6
OR	
MAT 126 Analytic Geometry and Calculus	(4)
MAT 215 Introduction to Statistics for Business and Economics	3
OR	
ECO 485 Introduction to Economic Statistics and Econometrics	(3)
ARE 123 Micro-Computer Applications for Agriculture	3
<b>TOTAL HOURS</b>	<b>12(10)</b>

##### Life Sciences and Agriculture

INT 219 Introduction to Ecology	3
Electives***	6
<b>TOTAL HOURS</b>	<b>9</b>

##### Economics

ECO 120 Principles of Microeconomics	3
ECO 121 Principles of Macroeconomics	3
ECO 421 Intermediate Macroeconomics	3
OR	

ECO 453 Money and Banking	(3)
ECO 420 Intermediate Microeconomics	3
TOTAL HOURS	12

**Agribusiness**

ARE 138 Agribusiness Accounting I	3
ARE 139 Agribusiness Accounting II	3
ARE 371 Introduction to Natural Resource Economics and Policy	3
ARE 453 Farm Management	3
ARE 454 Introduction to Production Economics	3
ARE 458 Principles of Management in Agribusiness	3
ARE 459 Agricultural Business Finance	3
ARE 465 Food and Fiber Marketing	3
ARE 468 Price Analysis and Forecasting	3
ARE 471 Resource Economics	3 OR
ARE 473 Land Economics	(3)
ARE 486 Government Policies Affecting Rural America	3
ARE 489 Seminar	2
Electives (any ARE courses)	9
TOTAL HOURS	44
Free Electives****	10(12)
FAA 117 Issues and Opportunities	1

MINIMUM HOURS REQUIRED FOR GRADUATION: 120

**Agribusiness Administration**

This is an academically challenging program that is recommended only for the most capable students. It is administered jointly by the Department of Agricultural and Resource Economics in the College of Applied Sciences

**Notes:**

\*Choose from the following fields: botany, microbiology, biochemistry, chemistry, geology, mathematics, physics, zoology

\*\*Choose from the following fields: agricultural and resource economics, anthropology, art, economics, education, English, history, journalism, language, literature, modern society, music, philosophy, political science, psychology, sociology, speech.

\*\*\*Any courses in the College of Applied Sciences and Agriculture and except those with the designations ARE, CLD, CHF and HEC.

\*\*\*\*Course offerings from the College of Business Administration are recommended for those interested in agribusiness. All students are encouraged to select additional courses from the Departments of Animal and Veterinary Science and Plant and Soil Science.

and Agriculture and by the College of Business Administration.

Students interested in the program apply for Admission to Agribusiness and Resource Economics in the College of Applied Sciences and Agriculture.

Admission to the five year program will officially occur after the student's freshman year.

Normal admission and continuance in the program requires, at least, a 2.5 cumulative average.

Students who successfully complete the 4-year undergraduate portion of the program will receive the B. S. in Agribusiness and Resource Economics, and will be eligible to apply to the Graduate School to enter the Master's Program in Business Administration.

Completion of the 4-year program *DOES NOT guarantee admission to the M. B. A. program.* Admission requirements for the M. B. A. include a good undergraduate grade point average, plus a minimum score of at least 475 on the Graduate Management Admission Test (GMAT). The following formula can be used as a guide to determine eligibility:

$$((\text{Undergraduate cumulative G. P. A.}) \times 200) + \text{GMAT score} = 1075 \text{ or more.}$$

Upon successful completion of the fifth year of the program, students will receive the M. B. A. degree.

Agribusiness Administration majors complete the same basic requirements as Agribusiness majors but take five additional business courses in place of electives. The five courses are listed below:

BUA 220 The Legal Environment of Business  
BUA 325 Principles of Management and Organization  
BUA 335 Business Information Systems  
BUA 350 Business Finance  
BUA 370 Marketing

**Resource Economics Concentration****Basic Sciences**

BIO 100 Basic Biology	4
Electives*	7
TOTAL HOURS	11

**Communications**

ENG 101 College Composition	3
SPC 103 Fundamentals of Public Communication	3
TOTAL HOURS	6

**Humanities and Social Studies**

ENG 317 Advanced Professional Exposition	3
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INT 324 Sociology of Rural Life Electives**	3 9
<b>TOTAL HOURS</b>	<u>15</u>

**Mathematics and Statistics**

MAT 113/114 Mathematics for Business and Economics I/II	6
OR	
MAT 126 Analytic Geometry and Calculus	(4)
MAT 215 Introduction to Statistics for Business and Economics	3
OR	
ECO 485 Introduction to Economic Statistics and Econometrics	(3)
ARE 123 Micro-Computer Applications for Agriculture	3
<b>TOTAL HOURS</b>	<u>12(10)</u>

**Applied Sciences and Agriculture**

INT 219 Introduction to Ecology Electives***	3 9
<b>TOTAL HOURS</b>	<u>12</u>

**Economics**

ECO 120 Principles of Microeconomics	3
ECO 121 Principles of Macroeconomics	3
ECO 421 Intermediate Macroeconomics	3
OR	

**Notes:**

\*Choose from the following fields: botany, microbiology, biochemistry, chemistry, geology, mathematics, physics, zoology.

\*\*Choose from the following fields: agricultural and resource economics, anthropology, art, economics, education, English, history, journalism, language, literature, modern society, music, philosophy, political science, psychology, sociology, speech.

\*\*\*Choose from PSS 140 Soils Science, PSS 150 Forest Soil Science, FOE 206 Photogrammetry and Remote Sensing, AEN 235 Soil and Water Control, PSS 100 Crop Science, FTY 444 Forest Economics, FTY 446 Forest Policy and Planning, or other ASA courses excluding ARE.

ECO 453 Money and Banking	3
ECO 420 Intermediate Microeconomics	3
<b>TOTAL HOURS</b>	<u>12</u>

**Agricultural and Resource Economics**

ARE 138 Agribusiness Accounting I	3
ARE 139 Agribusiness Accounting II	3
ARE 371 Introduction to Natural Resource Economics and Policy	3
ARE 454 Introduction to Production Economics	3
ARE 322 Human Factors in Resource Development	3
ARE 471 Resource Economics	3
ARE 473 Land Economics	3
ARE 486 Government Policies Affecting Rural America	3
ARE 489 Seminar	2
Electives in ARE or Economics****	9
<b>TOTAL HOURS</b>	<u>35</u>
Free Electives*****	16(18)
FAA 117 Issues and Opportunities	1

MINIMUM HOURS REQUIRED FOR GRADUATION: 120

\*\*\*\*Choose from ECO 471 Public Finance and Fiscal Policy, ECO 472 State and Local Government Finance, ECO 445 Regional Economics, ECO 444 Urban Economics, ARE 468 Price Analysis and Forecasting, ARE 474 Land Use Planning, or other appropriate ARE or economics courses.

\*\*\*\*\*Recommended electives include PAA 220 Introduction to Public Policy, PAA 200 Introduction to Public Management and Bureaucracy, SVE 111 Plane Surveying, SVE 221 Legal Aspects of Land Surveying, GEE 116 Cartographics, CIE 331 Fundamentals of Environmental Engineering, PSS 442 Soil Taxonomy, PSS 444 Soil Morphology and Soil Mapping, BIO 468 Limnology, or other electives listed under ASA and ARE above that are not used as electives in those areas.

## Bachelor of Science in Animal and Veterinary Sciences (Pre-veterinary)

The B. S. in animal and veterinary sciences is offered by the faculty of the Department of Animal and Veterinary Sciences.

The animal sciences curriculum is designed to provide a broad biological training as well as a thorough understanding of the anatomy, breeding, diseases, genetics, management, nutrition, and physiology of large animals, poultry, and laboratory animals.

Because a basic knowledge in animal sciences is fundamental to successful work in many job situations, the curriculum offers a wide choice of electives so students may adapt their courses of study to meet special professional interests or needs. Through the proper use of options, students can prepare for admission to graduate school or veterinary college, to teach sciences in secondary schools, to pursue technical sales and service work in the animal and poultry industries, for careers as laboratory animal technicians, or to develop such animal production enterprises as dairy, poultry, or livestock farms.

Courses in animal health are offered to support the curriculum in the department and the curriculum in wildlife management. They also serve as elective opportunities for students in other agricultural and life sciences, and in other colleges. This department also administers the Pre-Veterinary Science Program and provides an opportunity for students to be certified to teach high school biology and agriculture. (See Agriculture and Natural Resource Education.)

Superior students should consider continuing their studies at the graduate level. The Department of Animal and Veterinary Sciences offers the master of science degree in animal science for a program of study in animal nutrition, pathology, physiology, management, or breeding. The doctor of philosophy degree may be earned in the nutritional sciences or biological sciences program.

### Course and Credit Requirements

TOTAL CREDIT HOURS: 120	
Animal Science Courses	42
General Science Courses	32
Liberal Arts Courses	21
General Electives	25
(Including FAA 117: Issues)	(1)

<b>Animal Science Courses</b>	
ANV 145 Animal Science	4
ANV 260 Animal Genetics and Breeding	3
ANV 351 Animal Science Technology	2
ANV 437 Animal Diseases	3
ANV 455 Animal Nutrition	3
ANV 456 Applied Animal Feeding	4
ANV 461 Advanced Animal Breeding	3
ANV 472 Endocrinology	3
ANV 474 Senior Topics	1
ANV 480 Physiology of Reproduction	4
Production Courses*	12
<b>Large Animal Courses</b>	
ANV 346 Dairy Cattle Technology	(3)
ANV 347 Equine Science	(3)
ANV 348 Livestock Management	(3)
<b>Small Animal Course</b>	
ANV 211 Aquaculture	(3)
ANV 349 Laboratory Animal Technology	(4)
ANV 385 Poultry Technology	(3)
TOTAL HOURS	42
<b>General Science Courses</b>	
BIO 100 Basic Biology	4
ZOL 204 Animal Biology	4
CHY 111/112 General Chemistry I and II	8
OR	
BCH 207 Fundamentals of Chemistry	4
AND	
BCH 208 Elementary Physiological Chemistry	4
BCH 221 Organic Chemistry/Laboratory	4
ZOL 377 Animal Physiology	3
OR	
ANV 236 Physiology of Domestic Animals (3)	
MAT 122 Algebra and Trigonometry, Pre-Calculus	
OR	
(MAT 126, 232)	4 or 3
ARE 123 Micro-computer Applications for Agriculture	3
OR	

(COS 210, 215)	
FOS 301 Food Processing Industry:	
Principles and Problems	3
TOTAL HOURS	32/33

**Communications**

ENG 101 College Composition	3
OR	
(ENG 212, 317, JBR 231)	
SPC 103 Fundamentals of Public	
Communication	3
OR	
(SPC 106, 245, 247, 257)	
TOTAL HOURS	6

**Humanities/Social Sciences**

ARE 148 Principles of Agricultural	
Economics	3
OR	

\*Students are required to take four production courses; one must be either Dairy Cattle Technology (ANV 346) or Livestock Management (ANV 348) and another course from the small animal group. Substitution for the remaining two production courses will be allowed from any 300-400 level course in Biochemistry, Biology, Chemistry, Microbiology, Physics or Zoology. Other accepted courses are (ANV 212) Maine Mariculture, (ANV 335) Zoonoses, (ANV 409) Shellfisheries Biology.

(ECO 110)	
Plus 12 additional credits	
TOTAL HOURS	15

**Graduate School or Pre-veterinary Concentration**

Courses recommended:	
MAT 126 Analytic Geometry and	
Calculus	4
CHY 251/253 Organic Chemistry	
Lecture/Laboratory I	5
OR	
CHY 252/254 Organic Chemistry	
Lecture/Laboratory II	5
ZOL 333 Comparative Anatomy	4
MCB 300/305 General	
Microbiology/Laboratory	5
CHY 240 Quantitative Analysis	4
PHY 111/112 General Physics I/II	8
BCH 460 Advanced Biochemistry	3

**Education Minor**

Students have the opportunity to schedule courses in the College of Education which fulfill the requirements for certification to teach in primary and secondary schools (including biology and agriculture). See Agricultural and Natural Resource Education in index.

## Bachelor of Science in Bio-Resource Engineering

The B. S. in Bio-Resource Engineering is offered by the faculty of the Department of Bio-Resource Engineering.

The Bio-Resource Engineering curriculum combines study in engineering and mathematics with biological sciences and physical sciences to provide a unique background for solving engineering problems associated with agriculture, aquaculture, food and fiber processing.

The basic curriculum is strengthened by elective options which permit students to specialize in one of three areas according to their interests and needs. Areas of concentration are: (1) agricultural engineering; (2) aquacultural engineering and (3) food engineering. Electives in engineering and the life sciences aid in providing a broad base of knowledge for engineering practice.

Employment opportunities for bio-resource engineers are as diverse as the food and fiber industries themselves. Graduates in bio-re-

source engineering may be employed as design engineers by machinery and farmstead systems manufacturers; and by governmental entities; as sales engineers by machinery, food, or chemical companies; as research engineers by industry, government, or state experiment stations, or in teaching or extension positions by universities. Some work as consulting engineers. A number of opportunities for foreign service are available.

The curriculum in Bio-Resource Engineering is a joint responsibility of the College of Engineering and Technology and the College of Applied Sciences and Agriculture and is accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology.

This degree requires satisfactory completion of at least 131 degree hours at an accumulative grade point average of not less than 2.0 in a course of study which conforms to the following curriculum:



## Curriculum in Bio-Resource Engineering

### Bio-Resource Engineering

AEN 220 Principles of Mechanization	3
AEN 255 Materials in Agricultural Engineering	3
AEN 257 Computer Applications in Agricultural and Forest Engineering	3
AEN 268 Computer Aided Drafting and Design	3
AEN 281 Elementary Plane Surveying	1
AEN 282 Introduction to Agricultural Engineering	2
AEN 460 Agricultural Machinery	3
AEN 463 Farm Structures Design	3
AEN 464 Instrumentation and Control Systems	3
AEN 465 Soil and Water Engineering	3
AEN 467 Agricultural Power	3
AEN 469 Agricultural Process Engineering	3
AEN 480 Senior Seminar	1
AEN 491 Design Project I	1
AEN 492 Design Project II	2
AEN 493 Design Project III	1
MINIMUM HOURS	<u>38</u>

### Basic Engineering

GEE 101 Introduction to Engineering Design	3
MEE 150 Applied Mechanics: Statics	3
MEE 230 Thermodynamics I	3
MEE 251 Strength of Materials	3
MEE 270 Applied Mechanics: Dynamics	3
MEE 360 Fluid Mechanics	3
MEE 380 Design I	3
ELE 215 Electrical Circuit Fundamentals	3
MINIMUM HOURS	<u>24</u>

### Technical Electives

A group of engineering or science courses selected by the student and approved by the advisor.

MINIMUM HOURS	<u>9</u>
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### Basic Sciences and Mathematics

CHY 113 Chemical Principles I	4
PHY 121 General Physics I	4
PHY 122 General Physics II	4
MAT 126 Analytic Geometry and Calculus	4
MAT 127 Analytical Geometry and Calculus	4
MAT 228 Analytical Geometry and Calculus	4
MAT 259 Differential Equations	4
MINIMUM HOURS	<u>28</u>

### Agricultural and Biological Sciences

BIO 100 Basic Biology	4
PSS 140 Soil Science	3
Electives	3
MINIMUM HOURS	<u>10</u>

### Humanities, Social Sciences and Communications

MINIMUM HOURS	<u>21</u>
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(To include at least 16 credit hours of Humanities or Social Sciences)

### Other

FAA 117 Issues and Opportunities	1
MINIMUM HOURS REQUIRED FOR GRADUATION: 131	

Students under the Regional Program transferring to the University of Maine after the sophomore year from the Universities of Massachusetts, New Hampshire, Rhode Island or Vermont should check the bulletins of those institutions for curricula for the first two years in Agricultural Engineering.

### Graduate Work in Bio-Resource Engineering

The degrees of Master of Science (Bio-Resource Engineering) and Master of Engineering (Bio-Resource Engineering) are offered with options for specialization in soil and water engineering, farm structures, agricultural power and machinery, electric power and processing, and fisheries and aquaculture.

Several research assistantships are available each year. Incumbents devote half time to research on approved projects of the Maine Agricultural Experiment Station.

## Bachelor of Science in Forest Engineering

The bachelor of science degree in forest engineering is a program administered by the College of Forest Resources and the Agricultural Engineering Department. It is accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Tech-

nology, and by the Society of American Foresters. The program offers a unique opportunity to prepare for a diversity of challenging careers that direct engineering principles toward the needs of the forest environment. (See Index.)

## Bachelor of Science in Food Industry

The B. S. in Food Industry with a management option is offered by the faculty of the Department of Food Science.

The Food Science curriculum is designed to provide a strong educational background in the applications of the basic sciences (chemistry, biochemistry, microbiology) to food systems to enable students to prepare for careers in the rapidly growing food industry or to pursue graduate training. Students may concentrate in food science or may select the management option with a minor emphasis on agribusiness skills. The program provides students with the ability to solve problems related to the evaluation, preservation and quality control of foods during handling, storage, processing, distribution, and preparation for consumption.

The curriculum meets the Institute of Food Technologists guidelines for a B. S. degree in Food Industry which allows students to apply for national scholarships funded by multinational food companies.

Graduates with a B. S. in Food Industry find employment in the food industry in entry level technical (product development, food processing) or supervisory (quality control manager, processing control manager, distribution manager) positions. Government employment is available with the United States Department of Agriculture as food inspectors and/or graders or as part of a team of overseas scientists providing technical assistance in developing countries.

Superior students should consider graduate level studies. The Department of Food Science offers the Master of Science degree in Food Science while a Doctor of Philosophy degree may be earned in Nutritional Sciences.

### Curriculum in Food Science

#### Basic Sciences

BIO 100 Basic Biology	4
ZOL 204 Animal Biology	4
CHY 111/112 OR	
CHY 113/114 General Chemistry I/II	8
CHY 251/253 Organic Chemistry Lecture/Laboratory I	5
OR	
BCH 221 Organic Chemistry	(4)
CHY 252/254 Organic Chemistry Lecture/Laboratory II	5
OR	
BCH 322 Biochemistry	(4)
MCB 300/305 General Microbiology Lecture/Laboratory	5
PHY111/112 General Physics I/II	8
MAT 122 Algebra and Trigonometry, Pre-Calculus	4
MAT 126 Analytic Geometry and Calculus	4
MAT 232 Principles of Statistical Inference	3
BCH 451 Principles of Biochemistry	4
HNF 310 Human Nutrition	3
AEN 239 Agricultural Processing Technology	3
<b>TOTAL HOURS</b>	<b>58(60)</b>

#### Food Sciences

FOS 301 Food Processing Industry Principles and Problems	3
FOS 502 Food Processing I	4
FOS 503 Food Processing II	4
FOS 581 Problems in Food Science	

INT 438 Food Microbiology	4	MINIMUM HOURS REQUIRED FOR GRADUATION	120
FOS 582 Food Chemistry	4		
FOS 587 Food Analysis	4		
FOS 585 Quality Evaluation	2		
FOS 586 Food Biochemistry	3		
OR			
INT 265 Meat Technology	(3)		
OR			
CHY 240 Quantitative Analysis	(4)		
TOTAL HOURS	28(29)		
<b>Management Option Curriculum</b>			
Agribusiness courses to be substituted for basic science courses.			
ARE 148 Principles of Agricultural Economics			3
ARE 138/139 Agribusiness Accounting I/II			6
ARE 123 Micro-Computer Applications for Agriculture			3
ARE 358 Principles of Management in Agribusiness			3
ARE 365 Food and Fiber Marketing			3
ARE 354 Introduction to Production Economics			3
ARE 459 Agricultural Business Finance			3
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<b>Communications</b>			
ENG 101 College Composition	3		
SPC 103 Fundamentals of Public Communication	3		
TOTAL HOURS	6		
<b>Humanities and Social Sciences</b>			
TOTAL HOURS	15		
Free Electives	9-12		
FAA 117 Issues and Opportunities	1		

## Hotel/Restaurant and Tourism Administration

The hospitality industry is a major and growing sector of the state, national, and international economies. As the industry develops and becomes increasingly sophisticated, it is experiencing increased demand for well-educated supervisory and management-level personnel with relevant professional training. This program was developed in response to this need. A two-year program is also offered.

The intent of the baccalaureate program is to combine a broadly-based liberal education with professional courses that will prepare graduates for entry into management-level

career tracks in the hospitality industry. The program will have two distinct career options: restaurant/food service administration and hotel/resort administration. A third option, in tourism, is planned for the future.

In order for graduates to be ready for a professional position, it is essential that they acquired on-the-job experience through the structured externships which are built into this program.

Because the Hotel/Restaurant program was approved shortly before this catalog was prepared, only a brief outline is included above.

## Bachelor of Science in Landscape Horticulture

The Bachelor of Science in Landscape Horticulture is offered by the faculty of the department of Plant and Soil Sciences. In this program, students with a natural curiosity and enthusiasm for plant science have the opportunity to study landscape design and maintenance, greenhouse/nursery operations, and herbaceous/woody plant material. In addition, students take courses in basic sciences, com-

munications, business management, and liberal arts. Landscape horticulture graduates have the opportunity to select from a wide range of job opportunities. Examples of recent job openings are landscape consultant, grounds superintendent, golf course superintendent, garden center manager, nursery foreman and landscape gardener. A number of graduates now own businesses within the landscape hor-

ticulture industry. Employment opportunities are available both in and outside the state of Maine.

Positions in teaching, research, and extension may require training beyond the B. S. degree. The program provides a background that will allow students to pursue graduate programs in landscape architecture, ornamental horticulture, floriculture and horticultural therapy. For information call (207) 581-2939.

## Curriculum in Landscape Horticulture

### Landscape Horticulture Professional Courses

PSS 110 Horticulture	3
PSS 120 Herbaceous Landscape Plants	3
PSS 124 Greenhouse Management	4
PSS 126 Agrostology	3
PSS 127 Landscape Construction	3
PSS 140 Soil Science	3-4
PSS 221 Woody Landscape Plants I	3
PSS 222 Woody Landscape Plants II	3
PSS 223 Nursery/Garden Center Operations	3
PSS 225 Landscape Graphic Communication	3
PSS 328 Landscape Design	3
PSS 370 Seminar	2
PSS 410 Plant Propagation	3
PSS 425 Landscape Management	3
PSS 428 Landscape Design Problems	3
PSS 440 Soil Chemistry and Plant Nutrition	4
<b>TOTAL HOURS</b>	<b>50</b>

### Basic Sciences

BIO 100 Basic Biology	4
CHY 111/112 General Chemistry	8
COS 100 Introduction to Personal Computers	3 OR
ARE 123 Micro-Computer Applications for Agriculture	(3)
MAT 122 Algebra and Trigonometry, Pre-Calculus	4
<b>TOTAL HOURS</b>	<b>19</b>

### Professional Supporting Courses

BOT 201/202 Plant Biology	4
BOT 452/453 Plant Physiology	4
BOT 457 Plant Pathology	4
BOT 464 Taxonomy of Vascular	

Plants	4
ENT 228 Introduction to Applied Entomology	4
<b>TOTAL HOURS</b>	<b>20</b>

### Communications

ENG 101 College Composition	3
ENG Literature Course*	3
ENG 317 Advanced Professional Exposition	3
SPC 103 Fundamentals of Public Communication	3
<b>TOTAL HOURS</b>	<b>12</b>

### Humanities and Social Sciences

Minimum Hours	12
Free Electives—Minimum Hours	9
FAA 117 Issues and Opportunities	1
<b>TOTAL HOURS</b>	<b>22</b>
<b>MINIMUM HOURS REQUIRED FOR GRADUATION: 120</b>	

### Supporting Electives

AEN 268 Computer Aided Drafting and Design	3
ARE 138 Agribusiness Accounting I	3
ARE 148 Principles of Agricultural Economics	3
ARE 354 Introduction to Production Economics	3
ART 101 Drawing I	3
ART 111 Basic 2-D Design	3
ART 121 Basic 3-D Design	3
BOT 203 The Plant Kingdom	4
BOT 435 Plant Anatomy	4
ECO 110 Introduction to Economics	3
ENT 220 Insects, Sciences, and Society	3
ENT 449 Economic Entomology	3
INT 480 Pesticides and the Environment	3
PSS 144 Soil and Water Conservation	3
PSS 146 Land Use Planning--Soil Aspects	2
PSS 248 Soil Organic Matter and Fertility	4
PSS 397 Problems in Plant and Soil Sciences	Ar

\*Recommended choices: ENG 120, 121, 122, 123, 235.

## Bachelor of Science in Natural Resources

The B. S. in Natural Resources is an interdisciplinary program offered cooperatively by the faculty of the Departments of Agricultural and Resource Economics, Botany and Plant Pathology, Entomology and Plant and Soil Sciences. Students majoring in the program are taught and advised by faculty from several academic departments. The program is designed for students who wish to pursue a professional career in natural resource management, administration, planning, or research. The degree can also be used in preparation for postgraduate study in several disciplines related to natural resources.

The B. S. in Natural Resources is designed to acquaint students with the scope and characteristics of our renewable natural resources, and to introduce the scientific and economic principles that govern their use and conservation.

The Natural Resources curriculum is composed of seven requirement areas, amounting to between 101 to 105 credit hours (depending upon selections), plus 15 to 19 hours reserved for unstructured electives. The requirement areas are as follows: I. Natural Resources Core Courses; II. Biological and Ecological Science Courses; III. Physical and Chemical Science Courses; IV. Quantitative Skills Courses; V. Communication Skills Courses; VI. Humanities and Social Science Courses; VII. Natural Resources Concentration; VIII. Free Electives.

The requirements are designed so that Natural Resource graduates will be well grounded in both the natural and social sciences, and will possess the skills necessary for a successful career. However, the program is also designed to allow students ample flexibility to pursue individual interests in preparing for careers or postgraduate study.

The Natural Resources concentrations allow a student to pursue a particular aspect of natural resources in depth with an eye toward future employment or postgraduate study. Students should decide on their area of concentration early in their programs so that course choices in the freshman and sophomore years will include the prerequisites for courses in their chosen concentration. Concentrations currently offered are as follows:

1. Natural History and Ecology
2. Marine Resources and Sciences

3. Soil and Water Conservation
4. Resource and Environmental Economics
5. Land Use Planning
6. Earth Sciences
7. Environmental History and Social Science Perspectives
8. Government and Public Policy
9. Environmental Entomology
10. Waste Management
11. Individualized Concentration

### AREA I. THE NATURAL RESOURCES CORE (25 to 27 credits)

FAA 117 Issues and Opportunities	1
NRC 100 Introduction to Natural Resources	3
ARE 148 Principles of Agricultural Economics	3
POS 100 American Government	3
GES 101 Aspects of the Natural Environment I	4
PSS 140 Soil Science	4
OR	
PSS 150 Forest Soil Science	3
BIO 203 Field Natural History of Maine	3
NRC 200 Sophomore Seminar in Natural Resources	1
NRC 300 Junior Seminar in Natural Resources	1
NRC 400 Senior Paper in Natural Resources	1-3
NRC 489 Critical Issues in Natural Resource Policy	2

### AREA II. BIOLOGICAL AND ECOLOGICAL SCIENCES (14 credits)

All students in the Natural Resources program are required to complete a core of courses amounting to 14 credits in the biological and ecological sciences. Seven of these credits are determined, and seven more are to be selected from the approved list of courses. Advisors may authorize course substitutions in special circumstances.

BIO 100 Basic Biology	4
INT 319, INT 219, or WLM 200 (a course in ecology, INT 319 is required for some of the concentrations.)	3

Plus at least 7 chosen from the following list of 200-level and above courses.

BIO 468 Limnology	3
BOT 201/202 Plant Biology/Laboratory	4
BOT 203 Plant Kingdom	4
BOT 233 Dendrology	4
BOT 464 Taxonomy of Vascular Plants	4
BOT 473 Biology of Algae	4
ENT 226 Introductory Entomology	4
ENT 227 Introductory Entomology for Foresters	3
INT 375 Field Studies in Ecology	Arr.
INT 480 Pesticides in the Environment	3
ZOL 204 Animal Biology	4
ZOL 301 Natural History of the Maine Coast	2
ZOL 329/331 Vertebrate Biology I/Laboratory	4
ZOL 330/332 Vertebrate Biology II/Laboratory	4
ZOL 354/355 Biology of Behavior/Laboratory	5
ZOL 453 Invertebrate Zoology	4
ZOL 465 Evolution	3
ZOL 472 Aquatic Food Webs	2
WLM 201 Ecology Laboratory*	
<b>AREA III. PHYSICAL AND CHEMICAL SCIENCES (8 credits)</b>	
CHY 111/112 General Chemistry I/II	8
OR	
CHY 113/114 Chemical Principles I/II	8
OR	
BCH 207/208 Fundamentals of Chemistry/Elementary Physiological Chemistry	8
OR	
PHY 111/112 General Physics I/II	8
<b>AREA IV. QUANTITATIVE AND COMPUTER SKILLS (10 or 11 credits)</b>	
MAT 122 Algebra and Trigonometry (or other course in nonstatistical math at the level of MAT 122 or above)	4
OR	
Mat 215 or 232, FTY 204, BIO 451, ECO 485, or other statistics course approved by advisor	3-4
OR	
ARE 123 or COS 220, or other computer course approved by advisor	3

**AREA V. COMMUNICATION SKILLS (12  
credits)**

ENG 101/102 College Composition/College Composition, Advanced	3
ENG 317 Technical Writing	3
SPC 103 Fundamentals of Public Communication	3
SPC 247 Argumentation and Public Advocacy	3
OR	
SPC 257 Business and Professional Communication	3

**AREA VI. HUMANITIES AND SOCIAL  
SCIENCES (15 credits)**

All students graduating in the college must earn at least 15 credits in the humanities and social sciences. These courses, which are selected in consultation with an advisor, must be chosen to meet the following four objectives.

1. All graduates should have an appreciation for the historical and philosophical roots of our culture and for those of other major cultures.
2. All graduates should be knowledgeable about the socio-cultural environment in which we live, including knowledge of current events on the national and international levels.
3. All graduates should have some formal knowledge of the fine and performing arts as well as an appreciation of the effect of the arts on the human spirit.
4. All graduates should have some formal knowledge of the literary heritage of our culture, and should appreciate the role of literature in illuminating human nature and providing individual inspiration.

**AREA VII. THE NATURAL RESOURCES  
CONCENTRATIONS (18 credits)**

Each student is required to complete at least one natural resource concentration. Each concentration consists of 18 credits, at least 12 of which must be at the 300 level or above. Appropriate course choices must be made in the other 6 requirement areas to satisfy the prerequisites for the chosen concentration.

Ten or more courses are listed under each of the following concentrations. Students are required to build their concentrations largely from the courses on these lists. However, with the approval of the advisor, certain courses not on a list may also be used. Courses followed by an asterisk are required for the concentration.

\*This course requires INT 319 or WLM 200 as a prerequisite.

### Concentration 1. Natural History and Ecology

Students electing this concentration must take BOT 201/202, ZOL 204, and INT 319 as part of their Area II (biological and ecological sciences) requirement. It is recommended that MAT 151 or MAT 126 be taken to meet the non-statistical math component of the Area IV (quantitative and computer skills) requirement.

BIO 470 Wetland and Aquatic Biology	3
BIO 468 Limnology	3
ENT 220 Insects, Science and Society	3
FTY 349 Principles of Forest Management	3
INT 539 Ice Ages and Mankind	3
INT 563 Marine Benthic Ecology	3
OCE 370 Introduction to Oceanography	3
PSS 400 Bioclimatology	3
WLM 320 Introduction to Wildlife Conservation	2
WLM 420 Forest Wildlife Management	1
ZOL 525 Community Ecology	3

### Concentration 2. Marine Resources and Sciences

Students electing this concentration should take MAT 126 or MAT 150 to meet the non-statistical math component of the Area IV (quantitative and computer skills) requirement, and ZOL 204 and INT 319 as part of their Area II (biological and ecological sciences) requirement, plus GES 102 as a natural resources elective.

ANV 211 Aquaculture	3
ANV 212 Maine Mariculture	3
ANV 220 Topics in Marine Resources	2
ANV 409 Shellfisheries Biology	3
BOT 473 Biology of Algae	4
BOT 475 Algae Growth and Seaweed Mariculture	3
OCE 370* Introduction to Oceanography	3
ZOL 213 An Introduction to Marine Science	3
ZOL 453 Invertebrate Zoology	4
ZOL 470/471 Fishery Biology/Laboratory	4
ZOL 472 Aquatic Food Webs	2

### Concentration 3. Soil and Water Conservation

Students electing this concentration should take ZOL 204 and BOT 203 as part of their Area

II (biological and ecological sciences) requirement, CHY 113/114 for their Area III (physical and chemical sciences) requirement, and MAT 126 for the non-statistical math component of the Area IV (quantitative and computer skills) requirement.

BIO 468 Limnology	3
CIE 331 Fundamentals of Environmental Engineering	3
FTY 357 Forest Watershed Management	3
PSS 100 Plant Science	3
PSS 144* Soil and Water Conservation	2
PSS 146 Land Use Planning - Soil Aspects	2
PSS 440* Soil Chemistry and Plant Nutrition	4
PSS 442* Soil Taxonomy	3
PSS 444* Soil Morphology and Soil Mapping	3
PSS 447* Physical Properties of Soils	4

### Concentration 4. Resource and Environmental Economics

ARE 371 Introduction to Natural Resource Economics and Policy	3
ARE 471 Resource Economics	3
ARE 473 Land Economics	3
ARE 474 Land Use Planning	3
ECO 121 Principles of Macroeconomics	3
ECO 373 Intermediate Microeconomics	3
ECO 371 Public Finance and Fiscal Policy	3
HTY 277 History of Treatment of the American Environment	3
PAA 200 Public Management	3

### Concentration 5. Land Use Planning

ARE 473 Land Economics	3
ARE 474 Land Use Planning	3
ECO 344 Urban Economics	3
ECO 371 Public Finance and Fiscal Policy	3
ECO 373 Intermediate Microeconomics	3
HTY 277 History of Treatment of the American Environment	3
PAA 370 Urban Policy and Management	3
POS 233 Urban Politics	3
PSS 144 Soil and Water Conservation	2
PSS 146 Land Use Planning - Soil Aspects	2
PSS 444 Soil Morphology and Soil	

Mapping	3	ARE 474 Land Use Planning	3
FTY 208 Forest Surveying and Mapping	3	ECO 371 Public Finance and Fiscal Policy	3
FOE 206 Photogrammetry and Remote Sensing	3	FTY 349 Principles of Forest Management	3
FTY 480 Applied Geographic Information Systems	3	HTY 277 History of Treatment of the American Environment	3
<b>Concentration 6. Earth Sciences</b>		PAA 100 Foundations in Public Administration	3
Students electing this concentration are encouraged to take CHY 113/114 for their Area III (physical and chemical sciences) requirements, and MAT 126 and MAT 232 for the mathematics component of the Area IV (quantitative and computer skills) requirement.		PAA 200 Public Management	3
GES 102 Aspects of the Natural Environment II	4	PAA 220 Introduction to Public Policy	3
GES 109 Geology of Maine	3	POS 362 Maine Government and Politics	3
GES 311 Mineralogy	4	POS 361 The American Legislative Process	3
GES 312 Introduction to Petrology	4	PSY 239 Political Psychology	3
GES 315 Principles of Stratigraphy	4	WLM 320 Introduction to Wildlife Conservation	2
GES 324 Geology of North America	3	<b>Concentration 9. Environmental Entomology</b>	
OCE 370 Introduction to Oceanography	3	Students electing this concentration must take BCH 207/208 as their physical and chemical sciences requirement and BOT 201/202, Zol 204, and INT 319 as part of their biological and ecological sciences requirements. It is recommended that MAT 151 or MAT 126 be taken to meet the non-statistical math component of the quantitative and computer skills requirement.	
PHY 109 Climatology	3	BOT 233 Dendrology	4
PHY 110 Meteorology	3	BOT 445 Plant Genetics	3
PSS 440 Soil Chemistry and Plant Nutrition	3	BOT 464 Taxonomy of Vascular Plants	4
PSS 442 Soil Taxonomy	3	ENT 226* Introductory Entomology	4
PSS 444 Soil Morphology and Soil Mapping	3	ENT 449 Insect Pest Management	3
PSS 447 Physical Properties of Soils	4	ENT 460* Insect Biology and Taxonomy	3
<b>Concentration 7. Environmental History and Social Science Perspectives</b>		ENT 461* Insect Biology, Taxonomy, and Systematics	3
ANT 215 Social Anthropology	3	ENT 511 Insect Ecology	
ANT 364 Cultural Ecology	3	ENT 530 Aquatic Entomology	2
GEO 301 Historical Geography of North America	3	ENT 531 Aquatic Entomology Lab	2
SOC 101* Introduction to Sociology	3	ENT 570 Morphology, Physiology, and Behavior of Insects I	1-3
SOC 202 Social Problems	3	ENT 571 Morphology, Physiology, and Behavior of Insects II	1-3
SOC 312 Political Sociology	3	ZOL 453 Invertebrate Zoology	4
SOC 465 Evolution, Revolution, and the Future	3	ZOL 462 Principles of Genetics	3
HTY 217 Environmental History of Europe	3	<b>Concentration 10. Waste Management</b>	
HTY 277 History of the Treatment of the American Environment	3	CIE 331* Fundamentals of Environmental Engineering	3
HTY 319 Science and Society Until 1800	3	AEN 235* Water Supply and Waste Management	3
PHI 452 Philosophy of Natural Science	3	ARE 371 Introduction to Natural Resource Economics and Policy	3
<b>Concentration 8. Government and Public Policy</b>			
ARE 386 Government Policies Affecting Rural America	3		
ARE 473 Land Economics	3		



PSS 248 Soil Organic Matter and Fertility	4
PSS 447 Physical Properties of Soils	4
PSS 448 Soil Microbiology	4
PSS 440 Soil Chemistry and Plant Nutrition	4
CIE 433 Environmental Engineering Chemistry	3
SVE 522 Environmental Law and Resource Regulation	3
AEN 231 Processing Machinery	3
AEN 232 Buildings and Environment	3
AEN 281 Elementary of Plane Surveying	1

#### Concentration 11. Individualized Concentration

This concentration is organized jointly by the student and the advisor to fit a particular area of natural resource interest or a professional goal of a student.

#### UNSTRUCTURED ELECTIVES (15 to 19 credits)

An unstructured elective is any course for which the University awards academic credit. Students may use these credits to increase their professional job prospects by taking additional courses in their area of concentration or by completing course work in a second area of

concentration. Some natural resource students may elect courses in foreign languages to broaden opportunities for employment or for study in other countries. Other students may wish to broaden their knowledge in the arts and humanities. Natural resource courses not previously listed that may be of interest to natural resource majors are:

AEN 241 Energy and Society	3
BIO 260 Interactions Between Humans and Their Environment	3
ENT 220 Insects, Science and Society	3
FTY 444 Forestry Economics	3
FTY 446 Forest Policy and Planning	3
GES 224 Geology of the National Parks	3
GEO 201 Introduction to Human Geography	3
GEO 210 Geography of Maine	3
GEO 214 Geography of Canada and the United States	3
GEO 215 Cultural Geography	3
GEO 350 The Geography of Canada	3
INT 143 Tropical Agriculture	3
INT 480 Pesticides and the Environment	3
OCE 270 Oceanography Today	3
WLM 210 Development of Wildlife Conservation	2

## Bachelor of Science in Production and Processing Technology

The B. S. in Production and Processing Technology is offered by the faculty of the Department of Bio-Resource Engineering.

The curriculum provides training in specific aspects of engineering technology together with instruction in business, economics, computing and accounting. It is designed to prepare graduates for jobs in the application of equipment, systems and technologies to the production, processing, shipping, storage and handling of food and fiber products from agriculture, forestry, fisheries and aquaculture.

Graduates will find employment as

managers or maintenance supervisors of production and processing facilities, technical representatives for machinery and equipment companies, and support, testing or installation personnel for manufacturers, material suppliers, processors, contractors and primary producers.

This degree requires satisfactory completion of at least 125 degree hours at an accumulative grade point average of not less than 2.0 in a course of study which conforms to the following curriculum.

Graduates of the associate degree programs

in the College of Engineering and Science who are qualified for transfer into baccalaureate programs may transfer up to 60 credits for courses in which they have received a grade of "C" or better. Two additional years will be required to complete the degree of Bachelor of Science in Production and Processing Technology.

### Curriculum in Production and Processing Technology

#### Professional Courses

AEN 220 Principles of Mechanization	3
AEN 229 Basic Shop Techniques	2
AEN 231 Processing Machinery	3
AEN 232 Buildings and Environment	3
AEN 233 Fluid Power Technology	3
AEN 235 Water Supply and Waste Management	3
AEN 237 Automation and Process Control	3
AEN 238 Electrification	3
AEN 239 Processing Technology	3
AEN 255 Materials in Agricultural Engineering	3
AEN 480 Senior Seminar	1
<b>TOTAL HOURS</b>	<b>31</b>

#### Professional Field Supporting Courses

AEN 257 Computer Applications in Agricultural and Forest Engineering	3
AEN 268 Computer-Aided Drafting and Design	3
AEN 281 Elementary Plane Surveying	1
ARE 123 Micro-Computer Applications for Agriculture	3
ARE 138 Agribusiness Accounting I	3
<b>TOTAL HOURS</b>	<b>13</b>

#### Basic Sciences, Mathematics and Engineering

MAT 142A Algebra and Trigonometry	4
MAT 164A Analytical Geometry and Introductory Calculus	4
MAT 246A Introductory Calculus	4
PHY 111 General Physics I	4
PHY 112 General Physics II	4
BCH 207 Fundamentals of Chemistry	4
EET 210 Circuits, Machines and Electronics	3
MET 233 Thermal Science	3
MET 318 Statics and Strength of Materials	3
<b>TOTAL HOURS</b>	<b>33</b>

#### Communications

ENG 101 College Composition	3
ENG 317 Technical Writing	3
SPC 103 Fundamentals of Public Communication	3
<b>TOTAL HOURS</b>	<b>9</b>

#### Humanities and Social Sciences

ARE 148 Principles of Agricultural Economics	3
BUA 220 The Legal Environment of Business	3
Electives	9
<b>TOTAL HOURS</b>	<b>15</b>

#### Professional Field Electives\*

<b>TOTAL HOURS</b>	<b>24</b>
<b>MINIMUM HOURS REQUIRED FOR GRADUATION</b>	<b>125</b>

\*Recommended courses include MET 236: Thermal Applications, BIO 100: Basic Biology, and AEN 396: Field Experience (up to 8 credit hours).

## Bachelor of Science in Sustainable Agriculture

The B. S. in sustainable agriculture is an interdisciplinary program offered cooperatively by the faculty of the Departments of Bio-Resource Engineering, Agricultural and Resource Economics, Animal and Veterinary Sciences, Botany and Plant Pathology, Entomology, and Plant and Soil Sciences.

Professor Matt Liebman, Coordinator Agriculture in the United States is currently facing enormous challenges. Amid flourishing crops and abundant yields, many family farmers are going bankrupt. Fertilizers that were once cheap have become more expensive. Pesticides that were once effective are failing to overcome pests that have evolved resistance. In many areas, soil erosion and organic matter degradation have reached the point that increased quantities of fertilizers and irrigation are required to maintain crop yields. There is growing public concern over contamination of ground water by agricultural chemicals.

In the face of these challenges, the University of Maine is working to put profitability and environmental quality back into farming. The UM Sustainable Agriculture program stresses how to increase farm profits by decreasing the costs of crop and livestock production; how to build soil tilth and fertility through rotations, multiple cropping, and nutrient recycling; how to protect water quality by decreasing the need to use synthetic agrichemicals; how to manage crop pests and livestock diseases with minimal reliance on pesticides and pharmaceuticals; how to create a strong, diversified agriculture that can be sustained through years of fluctuating crop prices and weather.

The UM Sustainable Agriculture program includes seven core courses: (1) Principles of Sustainable Agriculture (2) Cropping Systems (3) Sustainable Animal Production Systems (4) Soil Organic Matter and Fertility (5) Agricultural Pest Ecology (6) Engineering for a Sustainable Agriculture (7) Integrated Farming Systems; Production Techniques and Economics

Students graduating from the UM Sustainable Agriculture program will have good analytic and problem solving skills. They should be qualified to work as public or private researchers and consultants, as policy analysts, or as farmers with sound training in natural resources management and economics.

The B. S. in Sustainable Agriculture requires

satisfactory completion of at least 120 degree hours at an accumulative grade point average of not less than 2.0 in a course of study which conforms to the following curriculum.

### Curriculum in Sustainable Agriculture

#### CORE CURRICULUM

##### Basic Sciences and Mathematics

CHY 111/112 General Chemistry I/II (or BCH 207, 208)	8
MAT 232 Principles of Statistical Inference	3
OR	
BIO 451 Biometry (or equivalent)	(3)
BIO 100 Basic Biology	4
Choose 1:	
ARE 123 Micro-Computer Applications for Agriculture	(3)
COS 100 Introduction to Personal Computers	(2)
Choose 1:	
MAT 114 Mathematics for Business and Economics II	3
MAT 126 Analytic Geometry and Calculus	4
MAT 151 Calculus for the Life Sciences I	4
<b>TOTAL HOURS</b>	<b>20-22</b>

##### Communications

ENG 101 College Composition	3
ENG 317 Technical Writing	3
SPC 103 Fundamentals of Public Communication	3
<b>TOTAL HOURS</b>	<b>9</b>

##### Sustainable Agriculture: Overview

PSS 105 Principles and Practices of Sustainable Agriculture	3
INT 444 Integrated Farming Systems	4
<b>TOTAL HOURS</b>	<b>7</b>

##### Pest Ecology and Management

INT 380 Pesticides and the Environment	3
OR	
INT 450 Agricultural Pest Ecology	3
<b>TOTAL HOURS</b>	<b>3</b>

**Plant and Soil Sciences**

PSS 140 Soil Science	4
PSS 100 Plant Science	4
PSS 101 Cropping Systems	4
<b>TOTAL HOURS</b>	<b>12</b>

**Animal and Veterinary Sciences**

ANV 145 Animal Science	4
<b>TOTAL HOURS</b>	<b>4</b>

**Agricultural and Resource Economics**

ARE 453 Farm Management	3
<b>TOTAL HOURS</b>	<b>3</b>

**Bio-Resource Engineering**

AEN 248 Engineering for a Sustainable Agriculture	3
<b>TOTAL HOURS</b>	<b>3</b>

**Humanities and Social Sciences**

ARE 148 Principles of Agricultural Economics	3
Electives	12
<b>TOTAL HOURS</b>	<b>15</b>
FAA 117 Issues and Opportunities	1

**TOTAL CREDIT**

<b>CORE CURRICULUM</b>	<b>77-79</b>
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**CONCENTRATION**

<b>INCLUDING ELECTIVES</b>	<b>41-43</b>
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<b>MINIMUM HOURS REQUIRED FOR GRADUATION</b>	<b>120</b>
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The Sustainable Agriculture concentrations identify for the student a course of study in general sustainable agriculture or in more specific concentrations. Students should select their concentration early in their program so that prerequisites can be completed in the freshman and sophomore years. The concentrations offered are as follows:

**Concentration 1. Sustainable Agriculture****REQUIRED COURSES**

PSS 248 Soil Organic Matter and Fertility	4
ANV 445 Sustainable Animal Production Systems	3
INT 380 Pesticides and the Environment	3
INT 450 Agricultural Pest Ecology	3
Choose 1:	
BOT 201 Plant Biology	4
ZOL 204 Animal Biology	4
Choose 2:	
PSS 403 Principles of Weed Control	3

ENT 228 Introductory Applied Entomology	3
BOT 457 Plant Pathology	4
Free Electives	20-23
<b>Concentration Total</b>	<b>41-43</b>

**Concentration 2. Agribusiness and Resource Economics****REQUIRED COURSES**

ARE 138 Agribusiness Accounting I	3
ARE 139 Agribusiness Accounting II	3
ANV 445 Sustainable Animal Production Systems	3
ARE 458 Principles of Management in Agribusiness	3
ARE 465 Food and Fiber Marketing	3
ARE 454 Introduction to Production Economics	3
ARE 371 Introduction to Natural Resource Economics Policy	3
ARE 459 Agricultural Business Finance	3
Business and Economics Electives	9
Free Electives	8-10
<b>Concentration Total</b>	<b>41-43</b>

**Concentration 3. Animal and Veterinary Sciences****REQUIRED COURSES**

ZOL 204 Animal Biology	4
ANV 236 Physiology of Domestic Animals	3
ANV 260 Animal Genetics and Breeding	3
ANV 348 Livestock Management	3
OR	
ANV 346 Dairy Cattle Technology	3
ANV 437 Animal Diseases	
ANV 351 Animal Science Techniques	2
ANV 455 Animal Nutrition	3
ANV 456 Applied Animal Feeding	4
ANV 445 Sustainable Animal Production Systems	3
ANV 461 Animal Breeding	3
OR	
ANV 480 Physiology of Reproduction	3
ANV 474 Senior Topics	1
Free Electives	9-11
<b>Concentration Total</b>	<b>41-43</b>

**Concentration 4. Plant Protection**

Students Electing this concentration must take BCH 207 / 208 as part of their basic sciences and

mathematics requirement and both INT 450 and INT 380 for their pest ecology and management requirement.

**REQUIRED COURSES**

BOT 201 /202 Plant Biology /Lab	4
ZOL 204 Animal Biology	4
INT 319 General Ecology	3
PSS 403 Principles of Weed Control	3
ENT 228 Introductory Applied Entomology	4
BOT 457 Plant Pathology	4
BOT 445 Plant Genetics	3
OR	
ZOL 462 Principles of Genetics	3
INT 380 Pesticides and the Environment	3
OR	
INT 450 Agricultural Pest Ecology	3
Electives (Select from following)	16-18
PHY 103/104 Descriptive Physics/Lab	4
ENT 449 Insect Pest Management	3
ENT 460 Insect Biology and Taxonomy	3
ENT 461 Insect Biology, Taxonomy and Systematics	3
BOT 452 Plant Physiology	3
BOT 464 Taxonomy of Vascular Plants	4
BOT 530 Biology of the Fungi	3
ENT 511 Insect Ecology	3
Others	
Concentration Total	<u>41-43</u>

**Concentration 5. Plant Science**

**REQUIRED COURSES**

PHY 111 /112 General Physics I and II	8
INT 380 Pesticides and the Environment	3
INT 450 Agricultural Pest Ecology	3
PSS 248 Soil Organic Matter and Fertility	4
ANV 445 Sustainable Animal Production Systems	3
BOT 452 /453 Plant Physiology /Lab	4
PSS 479 Crop Physiology	4

**Choose 1:**

BOT 435 Plant Anatomy	4
BOT 464 Taxonomy of Vascular Plants	4

PSS 400 Bioclimatology	3
ZOL 462 Principles of Genetics	3
BOT 445 Plant Genetics	3
PSS 410 Plant Propagation	3

**Choose 2:**

PSS 403 Principles of Weed Control	3
ENT 228 Introductory Applied Entomology	3
BOT 457 Plant Pathology	4

Free Electives 1-5

Concentration Total 41-43

**Concentration 6. Soil Science**

**REQUIRED COURSES**

PHY 111 /112 General Physics I and II	8
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INT 380 Pesticides and the Environment	3
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INT 450 Agricultural Pest Ecology	3
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PSS 248 Soil Organic Matter and Fertility	4
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ANV 345 Sustainable Animal Production Systems	3
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PSS 440 Soil Chemistry and Plant Nutrition	4
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PSS 146 Land Use Planning - Soil Aspects	2
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PSS 442 Soil Taxonomy	3
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**Choose 1:**

GES 541 Glacial Geology	3
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PSS 400 Bioclimatology	4
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PSS 444 Soil Morphology and Soil Mapping	3
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PSS 447 Physical Properties of Soil	4
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PSS 448 Soil Microbiology	4
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**Choose 2:**

PSS 403 Principles of Weed Control	3
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ENT 228 Introductory Applied Entomology	3
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BOT 457 Plant Pathology	4
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Free Electives 0-4

Concentration Total 41-43

## School of Human Development

Human Development encompasses physical, social, economic, and aesthetic aspects of living in complex, technologically changing societies. Knowledge coordinated from many fields of learning is applied to the process of decision-making that affects interpersonal and family relationships, the home environment, management of resources, nutrition, food, clothing, design, and human growth and development. Emphasis is placed upon improving the quality of life for families and individuals by helping them develop competencies for effective living.

The undergraduate curriculum has as its objectives specialized preparation for a variety of professional careers, general education for personal and family living, and courses for the enrichment of students from all disciplines.

A student's program, leading to the bachelor of science degree, includes courses in the arts, humanities, social and natural sciences, and specialized subjects from the School of Human Development in the areas of child development/family relations, human nutrition and foods, merchandising and consumer resources, and health and family life education. Students may prepare for graduate study leading to research, college teaching, and other specialized professional positions.

Programs of study may be developed for students from other countries or for those wishing to return to higher education to complete or update their professional positions.

The dietetics curriculum meets the requirements of the American Dietetic Association for internships and AP-4 programs. The Early Childhood Environments curriculum meets eligibility requirements of the National Council for the Accreditation of Teacher Education (NCATE). Education curricula meet State of Maine certification requirements for specialized fields.

A minimum of 120 degree hours and an accumulative grade point average of 2.0 in major coursework and overall program are required for graduation. In addition, students majoring in Child Development and Family Relations must maintain an accumulative average of 2.5

overall and a 2.75 in major courses to be eligible for student teaching.

### Degree Requirements

All students are required to take the following 35 hours:

#### **Communications: 6 hours**

Three hours in oral communications, and three hours in written communications.

#### **Laboratory Sciences: 8 hours**

To be selected from biochemistry, biology, botany, geology, chemistry, entomology, physics and astronomy, microbiology, or zoology. Biochemistry is required for human nutrition and foods, and health and family life majors. General chemistry and organic chemistry are required for human nutrition and foods majors.

#### **Social Sciences: 12 hours**

PSY 100 is required; others may be selected from anthropology, sociology, psychology, economics, history, political science, and modern society. Economics is required for merchandising and consumer resource majors. Anthropology, sociology, and economics are required of human nutrition and foods majors. Introductory courses are not to exceed nine hours.

#### **Humanities: 9 hours**

Art, design appreciation, foreign language, history, honors, music, philosophy, English, other than the basic communications course, performing arts, and selected anthropology courses. Two fields must be represented in these nine hours.

#### **Requirements**

Pre-professional sequences and electives complete the required 120 hours. In addition, those who enter the program in the first semester of their first year must complete the first-year seminar, FAA 117, for one credit to be counted toward the required 120 hours.

## Bachelor of Science in Child Development/Family Relations

This program provides training for professional work with children and families in schools, industry, government, and private service agencies. Students with the bachelor of science degree are employed in such diverse settings as day care centers, hospitals, community recreation centers, social service agencies, senior citizen centers, nursery schools, television stations, and public schools. With additional training, careers are open in the areas of family counseling, college teaching, parent education, administration, research, and social work.

Students interested in working with individuals and families may select from two concentrations. The early childhood environments concentration prepares students to work with the younger child in a variety of settings such as early childhood education, infant care, day care, nursery schools, kindergarten, recreation programs, counseling and mental health centers, pediatric wards, child development centers, clinics, and respite care for children. Those in this concentration who specifically intend to work in educational settings may apply for certification in elementary education with an emphasis on nursery-kindergarten through third grade. The certification process is governed by the Maine State Department of Educational and Cultural Services, Augusta, Maine.

The individual and family studies concentration allows students to specialize in different aspects of the field of human development and family studies. This concentration permits students flexibility in the design of their programs of study. For instance, students may elect to buttress their program with advanced classes in adult development and family development in order to prepare for careers in a variety of areas such as family planning, employee assistance programs, or gerontology. At present, although many students majoring in Child Development and Family Relations specialize in early childhood, nearly half of our graduates work in agencies and businesses servicing families and adults.

Students also may participate in the University Affiliated Program (UAP) in the Department of Pediatrics at Eastern Maine Medical Center. An Interdisciplinary Concentration in

Developmental Disabilities is required. (See UAP and Interdisciplinary Concentrations in Index.)

CHF 200 and CHF 201 are required in both concentrations and each course must be passed with a grade of "C" or better. Students earning less than a "C" in either of these courses must re-take that course before taking upper level courses for which these are prerequisites.

Students intending to transfer to the Child Development/Family Relations major from a four-year program should have a GPA of 2.5. Students from a two-year program should have a GPA of 2.8.

Students electing the Early Childhood Environments concentration must take the following courses:

### Early Childhood Environments

K-8 Eligibility	
CHF 201 Introduction to Child Development	3
CHF 200 Family Interaction	3
CHF 203 Practicum in Early Childhood Programs	3
CHF 331 Cognitive Development	3
ECE 321/322 Curriculum for Young Children I/II	6
ECE 420 Creativity and Young Children	4
ECE 421 Student Teaching in Early Childhood*	6
ECE 422 Field Placement in Early Childhood Environments*	6
ECE 423 Professional Seminar for Early Childhood Specialists	1
HNF 101 Introduction to Food and Nutrition	3
EDB 202 The American School	3
EDB 204 The Teaching Process	3
ERL 313 Teaching of Reading in the Elementary School	3
ERL 318 Teaching Language Arts in the Elementary School	3
SED 400 Survey of Exceptionality	3

\*Student teaching for the early childhood environments option will be contingent upon demonstrated competence in the prerequisite courses. All students applying for permission to student teach must have a TB test prior to placement.

Mathematics	6
TOTAL HOURS	59

Plus a subject concentration of 24 credits. However, if the subject concentration is in child development, only nine additional credit hours are needed because 15 credits in child development are already counted.

**Individual and Family Studies**

The following courses are required and must be passed with a minimum grade of "C":

CHF 200 Family Interaction	3
CHF 201 Introduction to Child Development	3
TOTAL HOURS	6

A minimum of 27 additional credits in child development and family relations courses is required. (Note: 48 credits of CHF/ECE courses are the maximum that will count toward the 120 credits needed to graduate).

Recommended electives (To complete 120 hours required for graduation): Students are not restricted in their choice of electives, but rather should consult with their advisor to select courses which best suit professional goals. The following list of recommended elec-

tives is meant to be illustrative, but not necessarily exhaustive.

- EDU 500 The Computer in Education
- \*ENG 317 Advanced Professional Exposition
- HNF 101 Introduction to Food and Nutrition
- HOM 485 Personal and Family Finance
- PAA 200 Public Administration
- PAA 340 Public Budgeting and Financial Administration
- PSY 308 Theories of Personality
- PSY 312 Abnormal Psychology
- PSY 330 Social Psychology
- \*PSY 341 Statistics in Psychology
- \*MAT 232 Principles of Statistical Inference
- SOC 316 Sociology of Aging
- SOC 318 Sociology of the Family
- SPC 110 Introduction to Human Communication
- SPC 257 Business and Professional Communication
- SWK 320 Introduction to Social Work and Social Welfare
- SWK 361 Social Work Methods
- SWK 440 Social Welfare Policies and Issues

\*Highly recommended for students intending to pursue education beyond the Bachelor's degree.

## Bachelor of Science in Human Nutrition and Foods

This program is designed to give professional preparation for those students who want to become dietitians, public health nutritionists, or food service administrators in commercial, industrial, publicly owned, or private food establishments. The curriculum provides the minimum competencies established by the American Dietetic Association. Graduates are eligible to apply for an ADA accredited dietetic internship or an AP-4 Approved Pre-planned Professional Program. Upon satisfactory completion of one of these programs the student may take the National examination leading to registration and/or licensure.

A minor in human nutrition and foods consisting of 15 credit hours above introductory level courses is available to any student.

### Curriculum for Pre-Dietetic Intern\*

HNF 101 Introduction to Food and Nutrition	3
HNF 102 Introductory Food and Nutrition Laboratory	2
HNF 103 Family Food Management	3
HNF 200/201 Food Service Systems Management I/II	8
HNF 301 Life Cycle Nutrition	3
HNF 330 The Science of Food Preparation	4

\*Approved by the American Dietetic Association and recommended for all dietitians. The university provides personal and automobile liability insurance for students who are on field trips or field experiences.



HNF 340 Experimental Foods	3	ECO 110 Introduction to Economics	3
HNF 401 Community Nutrition	4	CHY 111/112 General Chemistry I/II	8
HNF 410 Human Nutrition and Metabolism	3	BCH 221 Organic Chemistry	4
HNF 420 Nutrition in Abnormal Conditions	4	BCH 322 Biochemistry	4
BUA 325 Principles of Management and Organization	3	ANT 215 Social Anthropology OR	3
MCB 300/305 General Microbiology/Laboratory	5	ANT 102 Introduction to Anthropology II	3
BIO 100 Basic Biology	4	TOTAL HOURS	<u>83</u>
ZOL 204 Animal Biology	4		
ZOL 377/378 Animal Physiology/Laboratory	5	Basic college core and electives to complete 120 hours minimum.	

## Bachelor of Science in Merchandising and Consumer Resources

The Merchandising and consumer resources program of study is designed to improve the quality of living of individuals and families through the integration of the physical, biological, and social sciences and the arts and humanities. Students are provided with a broad general education and a strong foundation for a variety of professional careers in business, education, and service fields. The curriculum allows flexibility for choosing a specialty of particular interest through selection of appropriate major courses supplemented by related fields of study. Graduates with the bachelor of science degree are employed in such diverse positions as managers of apparel and textile businesses, fashion consultants, entrepreneurs of home-based and fashion related businesses, department store management and executive training program participants, consumer representatives for banks, utilities, and food and appliance businesses, and educators in the public and private sector including schools, government agencies, and extension. The program of study leads to a B. S. degree.

### Curriculum in Merchandising and Consumer Resources

#### Major Core

CLD 222 Apparel Analysis and Construction	3
CLD 225 Consumer Textiles	3
CLD 231 Design Appreciation	3
CLD 233 Applied Design	3
CLD 428 Seminar: Dress and Adornment	3
CLD 435 Fashion Marketing and Merchandising	3
HEC 270 Introduction to Home Economics	1
HOM 381 Family Resource Management	3
HOM 487 The Consumer in the Present Economy	3
HOM 488 Explorations in Current Consumer Issues	3
TOTAL HOURS	<u>28</u>

#### Career Core

CLD 424 Creative Clothing

Construction	3	OR	
CLD 425 Fashion Evolution	3	BUA 370* Marketing	3
CLD 429 Fashion Entrepreneurship	3	BUA 220 The Legal Environment of Business	3
CLD 439 Selected Issues in Apparel, Textiles, and Design	1-3	OR	
CLD 492 Interior Design	3	BUA 325* Principles of Management and Organization	3
HOM 485 Personal and Family Finance	3	JBR 250 Introduction to Advertising	3
HOM 491 Housing	3	SPC 257 Business and Professional Communication	3
HOM 493 Equipment and Energy Usage	3	SPC 277 Interviewing	3
HOM 499 Special Topics in Housing	3	MAT 113 Mathematics for Business and Economics	3
HUD 396 Field Experience in Human Development	3-15	COS 100 Introduction to Personal Computers	3
MINIMUM OF 15		MINIMUM OF 15	
<b>Business and Professional Courses</b>			
ARE 138 Agribusiness Accounting I		*ECO 120 and ECO 121 prerequisites.	
OR		Electives to complete 120 hours minimum.	
BUA 201 Principles of Accounting I	3	Students desiring Maine Home Economics teaching certification may choose courses to meet that requirement as an option.	
ARE 465 Food and Fiber Marketing			

## Bachelor of Science in Health and Family Life Education

This program is designed to provide professional preparation for those who want to become public school teachers or leaders in the newer fields of health and family life education. The content of the curriculum has been designed to fulfill national and state recommendations regarding the preparation needed for health educators.

General Education (from college requirements)	36 hours
Professional Education	32 hours
Major Courses	42 hours
Electives to complete 120 hours minimum.	

### Major Courses - Health and Family Life (42 Hours)

CHF 200 Family Interaction	3
CHF 201 Introduction to Child Development	3

CHF 351 Human Sexuality	3
CHF 431 Parenting	3
CHF 434 Adult Development and Aging	3
HNF 101 Introduction to Food and Nutrition	
OR	
HNF 280 Human Nutrition for the Health Professions	3
HOM 485 Personal and Family Finance	3
MCB 300/305 General Microbiology/Laboratory	5
BIO 100 Basic Biology	4
ZOL 208 Anatomy and Physiology	4
ZOL 316 Drug Use and Abuse	3
HPR 250 First Aid and Emergency Care	2
PSY 332 Environmental Psychology	
OR	

PSY 310 Psychology of Personal Growth	3	EDB 204 The Teaching Process	3
		HEC 373 Supervised Student Teaching (full semester)	15
<b>Professional Education/Certification (32 Hours)</b>		EDB 202 The American School	3
(Certification K-12 Health)		EDB 221 Educational Psychology	3
HPR 278 Health Education	2	SED 400 Survey of Exceptionality	3
HEC 371 Curriculum Development in Home Economics Education and Family Life		<b>Agency Concentration (No teaching eligibility - 21 Hours)</b>	
OR		SWK 320 Introduction to Social Work and Social Welfare	3
HPR 483 Planning the Health Education Curriculum	3	PAA 200 Public Management	3
HEC 372 Techniques of Teaching Home Economics and Health and Family Life		PAA 340 Public Budgeting and Financial Administration	3
OR		Nine additional credits of CHF courses and field experience of 3 credits to total 21 credits.	



## Courses in the College of Applied Sciences and Agriculture

### School of Human of Development

Associate Professor Cook (Director); Professor Oliver; Associate Professors Baranowski, Birnbaum, Csavinszky, Hyatt, Milardo, Schilmoeller, Schomaker; Assistant Professors Caron, Klimis-Tavantzis, Webber, White.

#### CHF 200 Family Interaction

Interpersonal dynamics of dating, courtship, mate selection, and the development of family life. Changing patterns of personal interactions within the family life cycle and a pluralistic society. Cr 3.

#### CHF 201 Introduction to Child Development

Influences on human development from conception through middle childhood. Theoretical perspectives, empirical evaluation, and practical implications. Cr 3.

#### CHF 203 Practicum in Early Childhood Programs

Introductory practicum combining child development and education theory with supervised weekly participation in the Child Development Learning Center. Focuses on the child under six years of age. Prerequisite: CHF 201. Rec 2. Cr 3.

#### CHF 331 Cognitive Development

Introduction to the developmental processes involved in the acquisition, organization, and processing of information, with an emphasis on the period between infancy and adolescence. Discussion of current theories and research on cognitive, memory, and language development and their applications and implications for teaching and parenting. Prerequisites: CHF 201, PSY 100. Cr 3.

#### CHF 351 Human Sexuality

Sexuality and its social implications against a background of constantly changing sexual mores. Sex role development, alternative conceptualizations of sexuality, and implications for future trends in human interaction. Cr 3.

#### CHF 352 Strategies for Family Intervention

Examination of the family as a system interacting with other social systems, focusing on

the practice and process of assisting or intervening in families. Prerequisite: CHF 200Cr 3.

#### CHF 404 Selected Topics in Child Development/Family Relations

Review of specific subject areas in the field. Subject areas vary by semester. (May be taken more than once for credit.) Prerequisite: CHF 201. Cr 3.

#### CHF 406 Introduction to Research Methods in Child Development and Family Relations

An overview of research methods applicable to the study of children and families. An in-class research project is completed. Prerequisites: CHF 200, CHF 201, or permission. Cr 3.

#### CHF 409 Special Problems in Child Development

Prerequisite: permission. Cr Ar.

#### CHF 431 Parenting

Parent behavior and the dynamics of parenthood are studied. Emphasis is on interpersonal, familial, and societal roles of parents, and factors influencing role behaviors and expectations. Prerequisite: CHF 200, CHF 201. Cr 3.

#### CHF 432 Socialization of the Child

A study of normal development and behavior with emphasis on children and the impact of peers, school, and family on the developing child. Theory in child development is also examined. Prerequisite: CHF 201. Cr 3.

#### CHF 433 Adolescence

Growth and development during the adolescent years. Conceptual models and recent research are discussed. Prerequisite: CHF 200, CHF 201 or permission. Cr 3.

#### CHF 434 Adult Development and Aging

Developmental processes and transitions from the early to later years of adulthood. Social, physical, cognitive, and familial aspects of adult growth and aging are examined. Prerequisite: CHF 201 or permission. Cr 3.

#### CHF 435 Developmental Assessment

An introduction to the basic principles and issues of assessment. Development of observational skills necessary for assessment and

interpretation of development and behaviors in family, educational and social service settings. Although the basic developmental, educational and intelligence tests will be discussed, this course is not designed to teach test administration. **Cr 3.**

#### **CHF 451 Family Relationships**

The study of traditional and non-traditional family units as a system of interactions between individuals. Prerequisite: CHF 200.

**Cr 3.**

#### **CHF 452 Violence in the Family**

Major forms of family violence, including child abuse and neglect, sexual abuse, and spouse abuse, are examined to provide students with an understanding of the development of dysfunctional forms of family interaction, descriptive knowledge on the prevalence of violent relationships at the national and local level, the necessary skills for identifying victims of abuse and the services available to them, and a preliminary understanding of the challenge of designing intervention strategies. Prerequisite: Junior or senior standing, CHF 200 or SOC 318 or permission. **Cr 3.**

#### **CHF 505 Psychodynamics of the Family**

Review of literature and research concerning the family, stressing interpersonal processes and communication. Prerequisite: Permission of the instructor. **Cr 3.**

#### **CHF 511 Seminar in Family Relationships**

Reports and discussions of current literature in family relationships and related social sciences with special attention to critical analysis.

**Cr 3.**

#### **CHF 525 Theories of Child Development**

Theoretical conceptualizations influencing the study of child development. Prerequisite: Permission of instructor. **Cr 3.**

#### **CHF 535 Recent Research in Child Development**

Advanced study of topics of current interest in the field of child development. Reports and evaluation of current research. Prerequisite: Permission of the instructor. (May be taken more than once for credit). **Cr 3.**

#### **CHF 540 Theories and Concepts of Family Development**

A critical evaluation of theories and concepts utilized in the understanding and study of family functioning. An interdisciplinary ap-

proach is utilized. Prerequisite: Permission of the instructor. **Cr 3.**

#### **CHF 550 Organization and Administration of Early Childhood Education Programs**

Current organization, policies and programs for day care, nursery school, non-public kindergarten, and experimental early childhood programs are explored and evaluated.

**Cr 3.**

#### **CHF 560 Seminar in Child Development**

Reports and discussions of research findings in child development. **Cr 3.**

#### **CHF 585 Newer Findings in Child Development and Family Relationships**

Recent findings in child development and family relationships selected to help teachers interpret children's interaction and adjustment to peers, to family, to school and to society.

**Cr 3.**

#### **CLD 222 Apparel Analysis and Construction**

Fundamentals of apparel construction and analysis of fit. Decision-making skills emphasized. Lec 2, Lab 2. **Cr 3.**

#### **CLD 225 Consumer Textiles**

Fundamentals of fibers, yarns, fabrications, and finishes as related to consumer selection, use and care of textiles. **Cr 3.**

#### **CLD 231 Design Appreciation**

Development of appreciation of beauty of line, form, color, and texture through application of design principles to achieve visual order. Practice in critical thinking and discriminating attitudes toward selection and evaluation of design forms and expression. **Cr 3.**

#### **CLD 233 Applied Design**

Application of design principles to problems in visual merchandising such as displays, advertising, and other promotional media. Prerequisite: CLD 231. Lab 2, Lec 2. **Cr 3.**

#### **CLD 424 Creative Clothing Construction**

An introduction to the principles of fashion design through the application of flat pattern methods. Development of a personal master pattern and the creation of an original garment design. Prerequisite: CLD 222 or permission. Lec 2, Lab 2. **Cr 3.**

#### **CLD 428 Seminar: Dress and Adornment**

Interdisciplinary study of dress and adornment within the context of cultural, social, psy-

chological, physical, economic, and aesthetic relationships. **Cr 3.**

**CLD 435 Fashion Marketing and Merchandising**

Theories of marketing, merchandising and buying will be applied to apparel and home furnishings. The interrelationships of sector of the fashion industry to economic, social, political, legal and historical environments are incorporated into merchandising strategies. Prerequisites: CLD 231, CLD 225 or permission. **Cr 3.**

**CLD 439 Selected Issues in Apparel, Textiles and Design** **Cr 1-3.**

**CLD 441 Consumer Issues in Textiles and Apparel**

Consumer issues related to clothing and textiles in a variety of managerial, technological, personal, and social situations. Informative labeling and consumer protection. Comparative analysis of new fiber, fabrications, finishes. Prerequisite: Undergraduate courses in textiles and clothing, or permission. **Cr 3.**

**CLD 492 Interior Design**

Planning residential interiors to meet human needs of individuals and families. Selections, organization of furnishing and materials. Layout in floorplans and wall elevations. Historic and contemporary interiors and furnishings. Prerequisite: CLD 231 or permission. Rec 2, Lab 2. **Cr 3.**

**CLD 531 Topics in Apparel, Textiles and Design**

Prerequisite: permission. **Cr 1-3.**

**ECE 321 Curriculum for Young Children I**

Exploration of topics such as selection of developmentally appropriate activities, time management, arrangements of the physical environment, staff management and program administration as they apply to the development of early childhood environments. Prerequisite: CHF 201, CHF 203, ECE 420 or permission. **Cr 3.**

**ECE 322 Curriculum for Young Children II**

Students will develop curriculum resource units for an early childhood environment (e. g. , preschool-3, daycare centers, play center for the hospitalized child). These course requirements will evolve from the contents structured in ECE 321. Prerequisite: CHF 201, CHF 203, ECE 420, ECE 321 or permission. **Cr 3.**

**ECE 420 Creativity and Young Children**

Exploration of theoretical and research evidence pertaining to the nature of creativity and the conditions requisite for its expression. Included will be the developmental stages, strategies, materials and workshops in specific areas including children's art, music, creative movement, story telling, play and creative dramatics. A practicum for the participation in, and translation of, theory into practice will be required. Prerequisite: CHF 203 or permission, junior standing. **Cr 4.**

**ECE 421 Student Teaching in Early Childhood**

Supervised student teaching in one of the following settings; nursery school, day care, or kindergarten through grade three. Prerequisite: senior standing. **Cr 6.**

**ECE 422 Field Placement in Early Childhood Environments**

Individual study in selected early childhood settings such as family day care homes, counseling and mental health centers, child development programs, child and family oriented hospital settings. Experience will include developmental assessments, planning and implementations of educational programs, family education courses, and assisting in special classes and group sessions. Prerequisites: Senior or graduate student standing and consent of the instructor. (Pass/Fail Grade Only). **Cr 6.**

**ECE 423 Professional Seminar for Early Childhood Specialists**

Examination of professional issues such as staff-client roles, professional ethics, employer-employee relationships, decision making in early child service agencies. Prerequisite: Concurrent with ECE 421 and ECE 422 or permission of instructor. (Pass/Fail Grade Only). **Cr 1.**

**HEC 270 Introduction to Home Economics**

A seminar to introduce pre-service professionals to philosophies, career opportunities, and objectives, and the professional environment. Rec 1. **Cr 1.**

**HEC 371 Curriculum Development in Home Economics Education and Family Life**

Current educational philosophies, principles, and practices; their application to home economics education through program planning and curriculum development. Prerequisite: HEC 270 or permission. **Cr 3.**

**HEC 372 Techniques of Teaching Home Economics and Health and Family Life**

Selection and use of teaching strategies and materials to promote development of concepts and thinking processes in the classroom. Learnings reinforced through microteaching and experience in public school classrooms. Prerequisite: HEC 270 and 371. Cr 3.

**HEC 373 Supervised Student Teaching**

Full semester student teaching in an approved junior or senior high school under direction of the local teacher and University supervisor. Students are expected to live in the school community. Opportunity to achieve competencies in teaching skills, professional role and subject matter concepts. Prerequisite: HEC 270, HEC 371 and HEC 372. Cr 15.

**HEC 411 Supervision of Student Teaching in Home Economics**

Theory and principles of supervision for improved educational programs; procedures for improved communication between supervisor and other personnel; evaluation of growth within individuals and programs. Cr 3.

Note: Designed for supervisory teachers, city/county/state supervisors, extension agents, and others in a supervisory capacity. Supervising teachers participating in student teaching programs do so on an individual basis. They must participate in a workshop or institute on the application of supervision theory to student teachers following a course which includes supervision principles and theory. These workshops will be sponsored by the institution with which the teacher will work.

**HEC 475 Special Topics in Home Economics**

Current philosophies, concepts and applications in selected topics of Home Economics. Cr 3.

**HEC 476 Adult Education**

Need for and purpose of adult education programs. Consideration of learning program development, organization, and administration of programs. Emphasis on adult education through the public schools. Cooperative Extension Service, and community agencies. Cr 3.

**HEC 579 Special Problems in Home Economics Education**

Cr 1-3.

**HNF 101 Introduction to Food and Nutrition**

A survey of food and nutrition principles, including the influence of food patterns on health

and physical performance; description of a balanced diet; study of the nutrients, interrelationships, sources, effects of processing and storage, food safety, fads, controversies, and individual dietary studies. Cr 3.

**HNF 102 Introductory Food and Nutrition Laboratory**

Nutrition principles for application through the life-cycle by using videos, slides, audiocassettes, measuring devices and food demonstrations. Students also study nutritional assessment through evaluation of individual dietary intake records, anthropometric measurements and biochemical parameters. Discussion of literature on "current" topics is also included. Required of HNF Majors. Others by permission. Corequisite: HNF 101. Lab 4. Cr 2.

**HNF 103 Family Food Management**

The criteria for making intelligent food choices. Application of those standards in the planning of family meals. Limited amount of food preparation and service. Rec 2, Lab 2. Cr 3.

**HNF 170 Fundamentals of Nutrition**

A study of the selection of food for promotion of fitness and prevention of disease. Exploration of what to eat when away from home or when using convenience foods. Consideration of nutrition labeling, food safety regulations and practices, and ways to meet standards with differing expenditures. Special attention to the energy nutrients and evaluation of advertising and media information. Cr 3.

**HNF 200 Food Service Systems Management I**

Basic principles of quantity food production and service. Emphasis on techniques to retain nutritive value and yield quality products, recipe standardization, portion control, sanitation, and use and care of equipment. Other areas include organizational structure, efficient methods and controls utilized by management in menu planning, purchasing, receiving, and storing of food, beverages, and supplies. Rec 2, Lab 4. Cr 4.

**HNF 201 Food Service Systems Management II**

Application of Management theories in a food service. Study of selected food service systems with emphasis on quality assurance, cost control, and training personnel. Local, state, and federal regulations. Current trends affecting management. Prerequisite: HNF 200. Rec 2, Lab 4. Cr 4.

**HNF 203 Special Problems in Food Service Management**

Permission Cr 1-3.

**HNF 270 World Food and Nutrition**

Investigation of the adequacy of world food supplies, and of the contributions to malnutrition made by poverty, government policies, and population growth. Cr 3.

**HNF 280 Human Nutrition for the Health Professions**

A nutrition course for nursing students and others in the health professions. Discussion of both normal and abnormal nutrition, metabolism and nutrient intake evaluation. Prerequisites: BCH 208 and ZOL 210. Cr 3.

**HNF 301 Life Cycle Nutrition**

Principles of nutrition applied to meeting dietary needs of individuals throughout their life cycle. Study of relationship among nutrition, growth, development, and maturity with emphasis on physical and psychosocial considerations affecting food intake. Prerequisite: HNF 101. Cr 3.

**HNF 330 The Science of Food Preparation**

Factors that determine results obtained in preparation and preservation of food. Selection of appropriate preparation techniques, considering chemical composition reactions, and structure stressed. Prerequisite: HNF 103, BCH 208 or BCH 322. Lec 2, Lab 4. Cr 4.

**HNF 340 Experimental Foods**

An experimental approach to the preparation of foods. An individual project will be selected, defined, planned, executed, reported and evaluated. Prerequisites: HNF 330, BCH 322 and junior and senior standing. Lec 1, Lab 4. Cr 3.

**HNF 398 Special Problems in Food and Nutrition**

Opportunity is provided for specialization in specific areas of food and nutrition. Prerequisite: HNF 101 or HNF 103 or permission. Cr 1-3.

**HNF 401 Community Nutrition**

Developing awareness of human needs and delivery systems within community setting. Focus on designing, implementing, and evaluating nutrition education programs or intervention projects. Field experience. Prerequisites: HNF 101, HNF 103, senior standing or permission. Cr 4.

**HNF 410 Human Nutrition and Metabolism**

Science of human nutrition stressing body me-

tabolism as integrated with organ function for normal individuals. Requirements for energy and nutrients. Prerequisite: BCH 322 and ZOL 204 or equivalent. Cr 3.

**HNF 420 Nutrition in Abnormal Conditions**

Principles involved in adjusting diets for diseases and abnormal conditions that may benefit from variations in normal diets. Prerequisites: HNF 410 and ZOL 377, ZOL 378. Rec 3, Lab 2. Cr 4.

**HNF 471 Recent Advances in Food and Nutrition**

Results of recent research and trends in food and nutrition with emphasis on their import for educational programs and related subjects. Prerequisite: courses in food and nutrition or permission. Cr 3.

**HNF 501 Topics in Advanced Human Nutrition**

Basic scientific and medical discoveries in human nutrition with emphasis on biological and physiological principles. Relationships of diet to human health and well-being. Prerequisite: BCH 322, HNF 410, ZOL 377, ZOL 378 or equivalent. Cr 3.

**HNF 502 Seminar in Nutrition**

Reports and discussion of recent developments in nutrition and related fields with special attention to critical analysis. Prerequisite: HNF 310 or equivalent. Cr 1-2.

**HNF 503 Nutrition and Food-Related Behavior**

Physiological, psychological and sociocultural influences on food-related behavior of individuals. Understanding regional food patterns and multiple influences that have a role in changing food behavior. Prerequisites: HNF 401 or permission. Cr 3.

**HNF 510 Trace Minerals**

Trace mineral metabolism with special emphasis on digestion and absorption. Excretion, storage and homeostatic mechanisms and the interactions of trace minerals to other dietary inorganic and organic components. Emphasis on clinical conditions. Prerequisites: HNF 310 and ZOL 377 or permission. Cr 3.

**HNF 596 Nutrition Education Practicum**

A planned program of nutrition education experiences in community, state and federal agencies and in an educational setting selected to meet individual needs. Prerequisite: HNF 503. Cr 1-6.



**HOM 381 Family Resource Management**

Analysis of the managerial process and its relationship to decision making. Emphasis on the use of resources including time, energy, and money to attain family goals. Cr 3.

**HOM 482 Field Experience in Family Resource Management**

Comparison of resources and home management practices of families and individuals of different social, economic, and educational levels at various stages of the family life cycle. Observation and analysis of management of resources to achieve goals through field placement with public and private agencies. Prerequisite: HOM 381. Rec 2, Lab 2. Cr 3.

**HOM 485 Personal and Family Finance**

Influence of outside economic conditions and personal circumstances on family financial problems. The management process applied to family problems involving finances - economic position, meeting living costs, protection against financial contingencies, credit, developing a savings and investment program, legal aspects of transactions. Prerequisite: junior standing. Cr 3.

**HOM 487 The Consumer in the Present Economy**

Examination of consumer problems; dimensions of the consumer role; interaction of consumers, government, and the market; consumer decision making; appraisal of information sources useful to consumers; analysis of programs for consumer protection. Cr 3.

**HOM 488 Explorations in Current Consumer Issues**

Issues of current interest to consumers. Issues will vary from year to year based on importance and student interest. Social and economic effect on families will be emphasized. Cr 3.

**HOM 489 Special Problems in Consumer Studies, Housing, Management** Cr 1-3.**HOM 491 Housing**

Physical, social and emotional aspects of the housing environment. Floor plan principles in relation to family life cycle. Local government controls; natural problems in housing. Prerequisite: junior standing. Cr 3.

**HOM 493 Equipment and Energy Usage**

Consumer buying of equipment for the home. Energy conservation in the use of small electric and major appliances. Prerequisite: junior standing. Cr 3.

**HOM 499 Special Topics in Housing**

Cr 1-3.

**HUD 394 Cooperative Education in Human Development**

A regular program of approved work experience for which academic credit is given, alternated with academic coursework. Students are provided opportunities to integrate theory with practice, to gain practical work experience, and to develop future placement opportunities. Prerequisite: junior standing and permission. (Pass/Fail Grade Only). Cr 1-16.

**HUD 396 Field Experience in Human Development**

An approved work experience for which academic credit is given. Students may work part time or full time for a semester in an approved program of work experience which contributes to the academic major. Students have the opportunity to gain practical experience in a job related to their professional career goals. Prerequisite: junior standing and permission. (Pass/Fail Grade Only). Cr 1-16.

**Interdisciplinary Courses****INT 250 (HUD) Forum on Food**

Introduction to the broad concept of food, its procurement, distribution and relationship to human health. Not open to freshmen. Cr 3.

**INT 476 (HUD) School and Society Study Tour**

A field based interdisciplinary study tour of educational facilities such as schools, hospitals, food services and selected agencies in foreign countries. Lectures, seminars, tours and presentations by teachers and officials. These will supplement guided visits to classrooms, hospitals, food services and agencies settings. Cr 3.

**Department of Agribusiness and Resource Economics**

Associate Professor Kezis (chairperson); Professors Delphendahl, Dunham, Ploch, Watkins; Associate Professors Criner, Johnston, Reiling, White; Assistant Professors Boyle, Cheng, Deller, Leiby, Marra; Lecturer and Assistant Scientist Cook

**ARE 123 Micro-Computer Applications for Agriculture**

An introduction to computers and computer applications for personal and agri-business

productivity. The course focusses primarily on the use of word processor, spread sheet and data base management applications software for the micro-computer environment. Also included are limited coverage of main-frame computer use, personal computer selection, programming and programming languages. The course emphasizes hands-on exposure to the materials. **Cr 3.**

#### **ARE 138 Agribusiness Accounting I**

Introductory accounting includes preparation of financial statements, mechanics of accounting cycle, and asset valuation and analysis. Prerequisites: None. Lec 2, Lab 2. **Cr 3.**

#### **ARE 139 Agribusiness Accounting II**

Continuation of introductory accounting includes analysis and interpretation of liabilities and stockholders equity, concept of present values, preparation of statement of changes in financial position and consolidated financial statements, analysis of financial statements, and accounting for inflation. Prerequisites: ARE 138. Lec 2, Lab 2. **Cr 3.**

#### **ARE 148 Principles of Agricultural Economics**

Economic principles applied to the business firm. Production, marketing, use of human and natural resources, governmental policy and international trade. Rec 3. **Cr 3.**

#### **ARE 281 World Food Demand, Population and World Food Supply**

The course will provide perspectives on the world food problem; the supply and demand for food; world population distribution and the unequal resource base of regions. Alternative policy measures to solve the food problem will be discussed. Prerequisites: ARE 148, ECO 110 or ECO 120. **Cr 3.**

#### **ARE 322 Human Factors in Resource Development**

Methods of applied social change in community and individual resistances to, and acceptance of, development programs. Consequences of development for community social systems. Development as an interactive force in the community. Prerequisite: permission. Rec 3. **Cr 3.**

#### **ARE 371 Introduction to Natural Resource Economics and Policy**

Economic aspects of natural resource management and policy will be presented. Both consumptive and nonconsumptive uses of natural resources will be discussed along with the so-

cially optimal use of renewable and nonrenewable resources. Contemporary environmental problems and policies will also be presented. Prerequisites: ECO 120 or ARE 148. **Cr 3.**

#### **ARE 394 Cooperative Education Agriculture and Resource Economics**

A regular program of approved work experience for which academic credit is given, alternated with academic coursework. Students are provided opportunities to integrate theory with practice, to gain practical work experience, and to develop future placement opportunities. Prerequisite: junior standing and permission. (Pass/Fail Grade Only). **Cr 1-16.**

#### **ARE 396 Field Experience in Agriculture and Resource Economics**

An approved work experience for which academic credit is given. Students may work part time or full time for a semester in an approved program of work experience which contributes to the academic major. Students have the opportunity to gain practical experience in a job related to their professional career goals. Prerequisite: junior standing and permission. (Pass/Fail Grade Only). **Cr 1-16.**

#### **ARE 453 Farm Management**

The concepts and tools of farm management in today's economic environment are developed. Among the topics covered are: types of farm business organizations, farm planning concepts and techniques, tax management, risk management, and farm growth, liquidation and transfer. Prerequisite: ECO 110 or ARE 148. **Cr 3.**

#### **ARE 454 Introduction to Production Economics**

Application of economic relationships; principles and problems of resource allocation at the firm level. Prerequisite: ECO 110 or ARE 148. Rec 3. **Cr 3.**

#### **ARE 458 Principles of Management in Agribusiness**

Fundamental concepts and tools of management and economics as applied to agribusiness firms including cooperatives. Emphasis on applications to nonfarm agribusiness that provide supplies and services to farmers or who market and process farm products. Case analysis. Rec 3. **Cr 3.**

#### **ARE 459 Agricultural Business Finance**

Designed to assist the student to develop skills necessary to deal with financial aspects of agricultural businesses. Cases and problems used

extensively to provide practical knowledge of financial analysis techniques. Rec 3. Cr 3.

**ARE 462 Recreation and Park Management**  
Fundamental management considerations related to the administration of recreation and park programs. Rec 3. Cr 3.

**ARE 465 Food and Fiber Marketing**  
Economic principles applied to marketing structures, services and agencies; analysis of costs and efficiencies; impact of industry organization and government. Prerequisite: ECO 110 or permission of instructor. Rec 3. Cr 3.

**ARE 468 Price Analysis and Forecasting**  
Analysis and measurement of factors affecting supply, demand, and elasticity, their relation to the level and changes of market prices, and use of quantitative techniques in forecasting. Prerequisite: ECO 373, MAT 215 or permission of instructor. Rec 3. Cr 3.

**ARE 471 Resource Economics**  
Principal economic and institutional factors affecting man and his use of land and resources; supply, demand and future requirements; economics of resource allocation, functioning of the market, benefit cost analysis; planning for more efficient use of resources. Prerequisite: ECO 110. Rec 3. Cr 3.

**ARE 473 Land Economics**  
Principle economic and institutional factors affecting land use. Emphasis on land rent, economics of land conservation, public measure for directing land use and taxation of landed property. Prerequisite: ARE 148 or ECO 110 or permission. Rec 3. Cr 3.

**ARE 474 Land Use Planning**  
Principles of planning for coordinated use and development of the land resource base. Survey of emerging concepts and problems that relate to land use policies and control measures. Emphasis on economics, legal, institutional, and social issues. Prerequisite: ARE 471 or permission. Cr 3.

**ARE 486 Government Policies Affecting Rural America**  
Analysis of policies and programs affecting rural America, policies affecting agriculture and the food industry. Prerequisite: ECO 110 or ARE 148 or permission. Rec 3. Cr 3.

**ARE 489 Seminar**  
Discussion of current economic and social problems. Prerequisite: seniors and graduate students. Rec 2. Cr 2.

**ARE 497 Independent Studies**  
Analysis of current problems in agricultural and resource economics, rural sociology, and community development. Prerequisite: permission of instructor. May be repeated for additional credit. Cr 1-3.

**ARE 511 Advanced Applications of Agricultural Economic Theory**  
Economic principles applicable to agricultural and resource problems, the principles and their use in policy evaluation. Comparative statics used to illustrate the application of consumer demand theory, the theory of the firm, production economics, market structure, and welfare economics. Prerequisite: ECO 373. Cr 3.

**ARE 517 Research Methods in Agricultural and Resource Economics**  
The nature of economic and social analysis. The scientific method and the formulation and testing of hypotheses. Introduction and use of economic research quantitative techniques, including matrix algebra, with computer applications. Prerequisite: MAT 232. Cr 3.

**ARE 518 Mathematical Optimization Techniques**  
Provides a working knowledge of mathematical optimization techniques and their application to relevant economic problems. Cr 3.

**ARE 527 Community Development-Principles**  
Analysis of the principals of community economic development in rural settings, with emphasis on social analysis, strategy planning and policy formulation. Cr 3.

**ARE 528 Community Development Applications**  
Introduction and practice of skills and strategies needed by community development practitioners including community development process, group process, social and behavioral change and manpower retraining. Selected presentations by practicing professionals in the field. Prerequisite: ARE 527. Cr 3.

**ARE 554 Production Economics**  
The principles of optimum resource allocation applied to the agri-business firm. The use of advanced techniques for attaining optimum resource allocation. Cr 3.

**ARE 565 Marketing Theory and Concepts in Agri-Business**  
Economic theory underlying the policies of agricultural marketing firms; study of current marketing problems and market practices for

selected commodities and segments of the agribusiness sector of the U. S. economy. Prerequisite: ARE 465, ECO 373. Cr 3.

**ARE 571 Advanced Resource Economics**

Analysis of economic theory as it relates to the development and management of exhaustable and renewable natural resources. Examines the unique characteristics of resource markets, the determination of optimal pricing and use, resource policy, and management issues. Prerequisite: ARE 511. Cr 3.

**ARE 572 Agricultural Trade and Economic Growth**

Theories and applications of international and interregional agricultural trade and economic growth. Prerequisite: ECO 373. Cr 3.

**ARE 577 Economics of Public Choice**

Analysis of economic systems as mechanisms for collective action. Emphasis on the role of property rights in natural resource utilization. Focus on the market system; reasons for market failure in resource allocation and income distribution; and analysis of extra-market and non-market alternatives for collective action. Prerequisite: ECO 373 Cr 3.

**ARE 593 Graduate Seminar**

Analysis of current problems in community development, resource use, management. Emphasis on economic and social effects. Problem areas vary from semester to semester. May be repeated for a total of 6 credits. Cr 1-3.

**ARE 597 Independent Studies**

Analysis of current problems in agricultural and resource economics, rural sociology, and community development. Maximum of six credits. May be repeated for additional credit. Cr 1-3.

**Interdisciplinary Courses**

**INT 224 (ARE, SOC, SWK) Sociology of Rural Life**

Significance of rural society in American culture. The impact of forces of change, including population movement. The significance of changes in the social systems of community, family, religion, education, and stratification. Rec 3. Cr 3.

**INT 324 (ARE, SOC, SWK) Contemporary Rural Problems**

A problem-oriented, class participation course focusing on the trends in contemporary rural society. Rural population displacement and

mobility, poverty, industrialization; consequent changes in occupational compositions, and related changes. Prerequisite: INT 224 or equivalent. Rec 3. Cr 3.

**INT 329 (ARE, SOC, SWK) The Individual and the Community**

Analysis of functioning and structure of the community. Emphasis on ways in which individuals and groups are affected by community dynamics. Community project. Prerequisite: INT 224 or permission. Rec 3. Cr 3.

**INT 444 (ARE, PSS) Integrated Farming Systems**

This course is designed to be a capstone to the Sustainable Agriculture Program. Students, in conjunction with the faculty instructors, will integrate the material taught in the various agriculture courses required of Sustainable Agriculture majors. The course will constitute an integration of the physical, economic, social and philosophical aspects of agricultural production. Prerequisites: PSS 100, PSS 140, ARE 148, and ARE 453 or equivalents. Lec 3, Lab 1. Cr 4.

**INT 530 (ARE, ECO) Econometrics**

An introduction to economic concepts and relationships expressed in quantitative terms. Problems of ordinary least squares, generalized least squares, estimation and use of multi-equation models and forecasting. Prerequisite: ECO 485 or permission. Cr 3.

**Department of Animal and Veterinary Sciences**

Associate Professor Stimpson (Chairperson); Professors Bayer, Gershman, Gibbs, Hidu; Associate Professors Barton, Congleton, Corey, Harris, Hawes, Kling, Stokes; Assistant Professor Wallace; Associate Extension Instructors Anderson, El-Begearmi, Opitz; Cooperating Professors Dow, Fakelman; Faculty Associates Andrews, Birmingham, Bushover, Chapman, Cohen, Cunliffe-Beamer, L. Davis, P. Davis, Feher, Fox, Gauger, Griffin, Havey, Ingraham, Lee, Meiczinger, Porter, Rogers, Ruksznis Sherman, Stevens, Stiles, Thompson, Trickey, Wall, Whittaker, Williams

**ANV 145 Animal Science**

Fundamental principles of the animal sciences, including animal genetics, breeding systems, the physiology of reproduction, animal nutri-

tion, and the physiology of lactation. Prerequisites: Freshman and Sophomore standing or by permission. Lec 3, Lab 2. Cr 4.

#### **ANV 211 Aquaculture**

The history and current status of world sea farming with emphasis on mollusks and the developing Maine situation. Cr 3.

#### **ANV 212 Maine Mariculture**

The history, current advances and status of world commercial techniques of a variety of marine animals, especially mollusks and fin-fish. Laboratories in aquaculture methods and field trips to commercial aquaculture sites in Maine. Prerequisite: Permission of instructor. Cr 3.

#### **ANV 220 Topics in Marine Resources**

An overview of current issues and knowledge relating to marine resources including socio-legal concerns, resource utilization, environmental quality, and the impact of marine trades. Prerequisite: none. Lec 2. Cr 2.

#### **ANV 236 Physiology of Domestic Animals**

A basic core in the physiology of domestic mammals and birds. Gross and histological features of animal systems involved in major physiological processes, meat uses, and disease. Prerequisite: ZOL 204 or equivalent. Lec 3. Cr 3.

#### **ANV 250 Our Environment**

Effect of the biological and physical environment on life and humankind. A basic, interdisciplinary, introduction to environmental issues. Students investigate one environmental topic of their choice in detail. A paper relating to these efforts, reflecting both the nature of the problem and solutions, is required. Open to students in all colleges. Offered as an eight-week block course. Cr 3.

#### **ANV 260 Animal Genetics and Breeding**

The principles of genetics. The transmission and expression of hereditary factors in animals. Prerequisite: ZOL 204. Lec 3. Cr 3.

#### **ANV 335 Zoonoses (Diseases Acquired From Animals).**

The etiology, infectious sources, mode of transmission, portal of entry, diagnosis, treatment, prevention, and control of pathogenic organisms transmissible to man from lower animals. Prerequisite: BIO 100 or permission. Lec 3. Cr 3.

#### **ANV 346 Dairy Cattle Technology**

The application of breeding, feeding, housing, selection, care, records, breed association pro-

grams and recent research findings to herd management. Prerequisite: ANV 145, ANV 480, ANV 260, ANV 455. Cr 3.

#### **ANV 347 Equine Science**

Principles of equine science, including breeds, breeding, conformation, nutrition, management, unsoundness, health program, selection, housing, and training. Lec 3. Cr 3.

#### **ANV 348 Livestock Management**

The selection, breeding, feeding, care and management of beef cattle, sheep, and swine. Prerequisite: ANV 145. Lec 3. Cr 3.

#### **ANV 349 Laboratory Animal Technology**

The principles and practices associated with research animal care in clinics, hospitals and laboratories. Topics will include animal models for human diseases and maintenance of germ-free animals; animal housing facilities; mating systems and record keeping; animal welfare issues and characteristics of various species. Prerequisite: ANV 145. Lec 3, Lab 3. Cr 4.

#### **ANV 350 Equine Behavior and Training**

The physiological development, control and education of the horse stressing biting, longeing, collection and schooling for saddle and driving. Prerequisite: ANV 347. Lec 2, Lab 2. Cr 3.

#### **ANV 351 Animal Science Techniques**

Direct application of current techniques used in the management of dairy and beef cattle, sheep and swine. Included are restraint, de-horning, castration, docking, milking, shearing and health management and computer applications in the animal sciences. Prerequisite: ANV 346 or ANV 348. Lec 1, Lab 3. Cr 2.

#### **ANV 352 Sheep Production**

The application of the principles of genetics, breeding, nutrition and management to sheep (lamb and wool) production in the Northeast. Laboratory devoted to practical experiences in techniques of sheep management from lambing to marketing. Prerequisite: ANV 145 or permission. Lec 1, Lab 2. Cr 2.

#### **ANV 368 Independent Study in the Animal Sciences**

An in-depth study into a specific area to be approved by the staff advisor at time of registration. (1) anatomy, (2) behavior, (3) breeding, (4) disease, (5) management, (6) nutrition, (7) physiology. Not more than five credit hours will be permitted in this course toward graduation. Prerequisite: ANV 145 or permission. Cr Ar.

**ANV 385 Poultry Technology**

The science of the biology, breeding, feeding, incubation, and diseases of the domestic fowl; and the application of housing, management, and business practices of the table egg, hatching egg, and broiler industries. Field trips are arranged to acquaint students with industry. Prerequisite: juniors and seniors. Lec 2, Lab 2.

Cr 3.

**ANV 394 Cooperative Education in Animal and Veterinary Science**

A regular program of approved work experience for which academic credit is given, alternated with academic coursework. Students are provided opportunities to integrate theory with practice, to gain practical work experience, and to develop future placement opportunities. Prerequisite: junior standing and permission. (Pass/Fail Grade Only). Cr 1-16.

**ANV 396 Field Experience in Animal and Veterinary Science**

An approved work experience for which academic credit is given. Students may work part time or full time for a semester in an approved program of work experience which contributes to the academic major. Students have the opportunity to gain practical experience in a job related to their professional career goals. Prerequisite: Permission. (Pass/Fail Grade Only).

Cr 1-16.

**ANV 409 Shellfisheries Biology**

The biology, ecology and management of commercial marine shellfish, especially mollusks. In a lecture, lab demonstration format the course will emphasize species commercially important to Maine's natural fisheries and those having a high potential in mariculture. Lec 3.

Cr 3.

**ANV 437 Animal Diseases**

Introduction to the study of disease in animals. Studies on the courses, pathology and control of diseases of domestic animals. Prerequisite: ANV 236, ZOL 377, permission. Lec 3. Cr 3.

**ANV 444 Diseases and Parasites of Wildlife**

Studies on diseases of North American wildlife emphasizing preventative and control measures with practice in diagnostic techniques. Wildlife majors. Lec 2, Lab 2. Cr 3.

**ANV 445 Sustainable Animal Production Systems**

The study of various animal (monogastric/ruminant aquatic) production systems from the standpoint of sustainable agriculture. Emphasis will be on integrating the various aspects of animal production into the overall

farm management scheme and to evaluating the feasibility of these schemes regarding animal productivity, farm profitability and environmental impact. Prerequisites: ANV 145, PSS 100, PSS 105. Lec 3. Cr 3.

**ANV 455 Animal Nutrition**

Principles of nutrition, methods of experimentation and discussion of nutritional balances. Prerequisite: ZOL 204, CHY 112, BCH 221 or equivalent. Cr 3.

**ANV 456 Applied Animal Feeding**

Nutrient requirements of livestock and avian species. The nutritive value and characteristics of feedstuffs. Methods of formulating balanced nutrient intakes. Prerequisite: ANV 455. Lec 3, Lab 2. Cr 4.

**ANV 461 Animal Breeding**

The inheritance of the commercially valuable characteristics. Methods of estimating heritability and repeatability. Mating systems and their effects. Progeny testing, selection indices and other methods to increase intensity and accuracy of selection. Prerequisite: ANV 260 and MAT 122 or MAT 126 or MAT 232 and ARE 123 or COS 210, COS 215. Lec 2, Lab 2. Cr 3.

**ANV 472 Endocrinology**

The animal endocrine system and functional relationships of each of the endocrine glands to growth, reproduction and lactation. Prerequisite: ZOL 377 or ANV 236. Lec 3. Cr 3.

**ANV 474 Senior Topics**

Review and evaluation of current literature in the animal sciences. Each student will participate in a panel presentation and will also present an individual seminar. Senior students. Lec 2. Cr 1.

**ANV 480 Physiology of Reproduction**

Comparative development and functions of the reproductive process domestic animals. Prerequisite: ZOL 377 or ANV 236. Lec 3. Cr 3.

**ANV 501 Monogastric Nutrition and Physiology**

Structure of the monogastric gastrointestinal tract and its functions will be discussed. Details of digestive absorption and secretion of digestive glands will be emphasized. The utilization of energy, proteins, fats, carbohydrates, vitamins and minerals will be studied. Prerequisites: ANV 236, ANV 455, ANV 456, BCH 322 or equivalent courses. Lec 3, Cr 3.

**ANV 502 Ruminant Nutrition and Physiology**

Ruminant metabolism will be explored from the point of rumen function, factors which

modify it and the effects on the flow of nutrients to the host animal. Anatomical and physiological development of the rumen will be covered. Factors affecting digestion and microbial metabolism will be given special attention in the context of a dynamic system. Prerequisites: ANV 236, ANV 455, BCH 322 or permission. Lec 3. **Cr 3.**

**ANV 503 Advanced Animal Pathology**  
General and systemic animal pathology viewed as physiological and morphological dysfunctions. Emphasis on the basic principles of the disease process with reference to a variety of different types of etiological agents. Prerequisites: ANV 236, ANV 437, ANV 455, BCH 322 or equivalents. Lec 3. **Cr 3.**

**ANV 504 Research Methods in Ruminant Nutrition**  
A multi-disciplinary introduction to some laboratory and animal techniques used in nutritional research. Prerequisites: ANV 455 or NFS 310, CHY 240 or permission. Lec 2, Lab 6. **Cr 3.**

**ANV 505 Nutritional Energetics**  
A systematic discussion and evaluation of the factors which influence partition of dietary energy in all species. Particular emphasis will be placed on dietary composition and nutritional adequacy as they influence energy metabolism. Emphasis will also be placed on the development of systems for rationing based on energetics. Prerequisites: ANV 455, BCH 450 or permission. Lec 3. **Cr 3.**

**ANV 506 Vitamins**  
Advanced study of the fundamental role of vitamins and minerals in nutrition, including their chemical properties, absorption, metabolism, storage, excretion and deficiency symptoms. A critical study of the biochemical basis of vitamin function and their interrelationships with other substances. Prerequisites: ANV 455 or HNF 310, BCH 322 or permission. Lec 2. **Cr 3.**

**ANV 507 Nutritional-Environmental Interactions**  
Effects of the physical environment on the nutrition, metabolism and performance of animals. Implications for their feeding and management. Prerequisites: ANV 455 or HNF 310, PHY 106 or permission. Lec 3. **Cr 3.**

**ANV 508 Minerals**  
A discussion of the inorganic elements, both essential and nonessential and their metabolism. Discussion will include the absorption, bio-

chemical function, excretion, storage, and deficiency and toxicity symptoms associated with each. Emphasis will also be placed on the interaction of minerals with other inorganic and organic substances. Prerequisite: ANV 455 or HNF 310, BCH 322 or permission. Lec 3.

**Cr 3.**

**ANV 590 Special Topics in Animal Science**  
Anatomy, breeding, diseases, management, nutrition, physiology as related to poultry, dairy, or marine animals. Prerequisite: permission. **Cr Ar.**

### Interdisciplinary Course

**INT 265 (ANV, FOS) Meat Technology**  
The basic science of meat and meat processing, packinghouse methods and cutting of meat. Rec 2, Lab 2. **Cr 3.**

### Department of Bio-Resource Engineering

Professors Riley (Chairman), Rhoads, Rowe, Smith; Associate Professors Christensen, Hedstrom, Huff, Hunter, Soule; Assistant Professor McBurnie;

**AEN 220 Principles of Mechanization**  
Basic concepts of farm and forest mechanization; functional analysis and organization of machine systems and materials handling operations. Prerequisite: MAT 122. Lec 2, Lab 2. **Cr 3.**

**AEN 229 Basic Shop Techniques**  
A course in selection, care and use of tools, woodworking techniques, metalworking and welding. For Agricultural Mechanization and Agricultural Education majors only. Lec 1, Lab 3. **Cr 2.**

**AEN 230 Park Service and Maintenance**  
Basic introduction to the specialized services and maintenance of parks and recreation areas, including construction, systems operations, equipment use and repair, and materials applications. Lec 2, Lab 2. **Cr 3.**

**AEN 231 Processing Machinery**  
Introduction to machinery used in processing food and fiber. Study of mechanisms and components with emphasis on commercial applications. Topics include power transmission, materials handling, safety, and properties of bulk materials related to transport. Prerequisite: MAT 122. Lec 2, Lab 2. **Cr 3.**

**AEN 232 Buildings and Environment**

Consideration of environmental control; methods and materials of construction; functional requirements and system economics of production, processing and storage buildings. Prerequisite: MAT 122. Lec 2, Lab 2.

Cr 3.

**AEN 233 Fluid Power Technology**

Basic fluid power systems, component installation and function analysis, basic system design, troubleshooting and testing techniques. Prerequisite: PHY 111, 112 or PHY 106 or permission. Lec 2, Lab 3.

Cr 3.

**AEN 235 Water Supply & Waste Management**

The study of hydrologic processes and development of water supply systems, water quality and quantity analyses, and reservoir development. Design of pumping plants, wells, water delivery systems, and waste disposal systems is covered, together with a review of environmental and energy concerns, and selection of components and management strategies relative to these systems. Lec 2, Lab 3.

Cr 3.

**AEN 236 Farm and Forest Power**

Principles of construction, operation, and maintenance of internal combustion engines, tractors, and related equipment. Selection, application, and management of power equipment in farm and forestry activities. Prerequisite: MAT 122. Lec 2, Lab 2.

Cr 3.

**AEN 237 Automation and Process Control**

An introduction to measurement theory, process monitoring, data acquisition, applied control theory and robotics with emphasis on applications in processing and manufacturing. Prerequisite: MAT246A and PHY 112. Lec 2, Lab 2.

Cr 3.

**AEN 238 Electrification**

Fundamentals of electric circuits. Basic wiring techniques and planning of wiring systems. Selection, use, and care of electric devices and controls used in agriculture and forestry. Emphasis on practical application. Prerequisite: PHY 106 or equivalent. Lec 2, Lab 2.

Cr 3.

**AEN 239 Processing Technology**

The sizing and selection of equipment and systems for the food and fiber processing industry are studied. The basics of fluid mechanics for closed pipe flow of liquids and air is used to introduce pumps, fans and their systems. The psychrometric properties of air vapor mixtures are studied with respect to ventilating and dry-

ing systems. The principles of materials handling and specific handling systems are considered, together with an introduction to the theory and application of refrigeration and air conditioning. Prerequisites: MAT 122 & PHY 111, PHY 112. Lec 2, Lab 2.

Cr 3.

**AEN 241 Energy and Society**

Basic concepts of energy and power. Energy sources and their limitations. Demands for energy, forms in which we use it, and reasons for shortages. Energy conversion, storage, and transport, and their effects on environment. Energy conservation and future use of energy. Lec 2, Lab 2.

Cr 3.

**AEN 242 Metals and Society**

The influence of metals technology on society, past and present. After a brief historical review the course covers the scope of our metallic resources, mining and concentration methods, extraction, refining and fabrication. Recycling and environmental effects are examined. Properties of metal, alloying and heat treating are briefly covered. Welding as a fabrication method is studied and electric arc and gas welding instruction is given in the two-hour lab. No prerequisite. Lec 2, Lab 2.

Cr 3.

**AEN 248 Engineering For A Sustainable Agriculture**

Study of the applications of engineering technology to sustainable agriculture. Emphasis will be on the use of energy, internal combustion engine power, mechanized implement, buildings and soil and water resources with attention given to reducing inputs, maximizing returns, and providing for low environmental impact. Prerequisites: PHY 106 or equivalent, PSS 100. Lec 3.

Cr 3.

**AEN 255 Materials in Agricultural Engineering**

Introduction to physical and mechanical properties of structural and biological material useful in agricultural and forest engineering design and application. Prerequisite: PHY 121 or permission of instructor. Lec 2, Lab 2.

Cr 3.

**AEN 257 Computer Applications in Agricultural and Forest Engineering**

An introductory programming course using the FORTRAN language. Program exercises are selected to illustrate numerical techniques important in engineering and are done on either the mainframe or microcomputer. Additional topics include an introduction to using: microcomputers, data files, graphic input and



output devices, editors, wordprocessors and spreadsheets. Prerequisite: MAT 126. Lec 2, Rec 2. **Cr 3.**

**AEN 268 Computer Aided Drafting and Design**

An introductory computer aided drafting course using the VERSACAD two and three dimensional software package on microcomputers. Drawings produced are plotted either on an ink pen plotter or line printer. Additional topics include: Computer Aided Design and Computer Aided Manufacturing in industry, microcomputer use, graphic input and output devices. Prerequisite: GEE 101. Lec 1, Rec 1, Lab 3. **Cr 3.**

**AEN 281 Elementary Plane Surveying**

An elementary course designed to help the student understand the concepts and develop the skills necessary for basic surveying. Lec 1. **Cr 1.**

**AEN 282 Introduction to Agricultural Engineering**

An introduction to engineering experimentation involving biological material. Primarily for sophomores majoring in agricultural engineering. Lec 1, Lab 2. **Cr 2.**

**AEN 298 Special Topics in Agricultural Engineering**

Studies are offered in hydraulic power systems, surveying techniques and advanced welding and design. Also available as a five week block course. Transcript will show area of study. **Cr Ar.**

**AEN 341 Energy and Society**

Basic concepts of energy and power. Energy sources and their limitations. Demands for energy, forms in which we use it, and reasons for shortages. Energy conversion, storage, and transport, and their effects on environment. Energy conservation and future use of energy. (C. E. D. only). **Cr 3.**

**AEN 342 Metals and Society**

The influence of metals technology on man's existence. A practical look at testing, properties manipulation, fabrication, and utilization of metals is included. Production and processing methods. Environmental effects. Welding instruction available at the student's option. No prerequisite. Lec 3. (C. E. D. only). **Cr 3.**

**AEN 343 Energy-Efficient Housing**

Examination of mankind's efforts to develop shelter. Topics will include determination of a family's housing needs, selection and utiliza-

tion of a home site, selection of materials, structural design of framing components, heating systems, insulation, water systems, electrical systems, and estimations of construction costs. Lec 3. (C. E. D. only). **Cr 3.**

**AEN 380 Senior Seminar**

Problems associated with professionalism and the first employment of the young agricultural engineer. Lec 1. **Cr 1.**

**AEN 394 Cooperative Education in Agricultural Engineering**

A regular program of approved work experience for which academic credit is given, alternated with academic coursework. Students are provided opportunities to integrate theory with practice, to gain practical work experience, and to develop future placement opportunities. Prerequisite: junior standing and permission. (Pass/Fail Grade Only). **Cr 1-16.**

**AEN 396 Field Experience in Agricultural Engineering**

An approved work experience for which academic credit is given. Students may work part time or full time for a semester in an approved program of work experience which contributes to the academic major. Students have the opportunity to gain practical experience in a job related to their professional career goals. Prerequisite: junior standing and permission. (Pass/Fail Grade Only). **Cr 1-16.**

**AEN 452 Fluid Power and Robotics**

Design of pneumatic and hydraulic circuits. Control theory applied to fluid power actuated mechanical systems. Data acquisition, transducers, computer interfacing, and programming for control. Introduction to robotics, robot kinematics, coordinate frame transformations, path description and planning. Laboratory work includes design and test of fluid power systems including computer control and programming the motion of a jointed manipulator. Prerequisite: Dynamics, Fluid Mechanics, Differential Equations and Circuit Theory, Junior Standing or permission. Rec 2, Lab 3. **Cr 3.**

**AEN 460 Agricultural Machinery**

A design oriented course for engineering majors covering power requirements, capacity, economics of agricultural machines. Functional analysis is an integral part of the course. Laboratory and field testing is carried out. Prerequisite: MEE 251. Lec 2, Lab 3. **Cr 3.**

**AEN 462 Fluid Power**

Fluid power fundamentals and theory, analysis and operation principles of components, design techniques and circuit analysis for hydraulic systems, introduction to pneumatic systems. Prerequisites: MEE 230 and MEE 360 (or CIE 350) or permission. Lec 2, Lab 3.

Cr 3.

**AEN 463 Farm Structures Design**

Structural design and environmental control in production, processing and storage buildings; consideration of functional requirements, system economics and methods and materials of construction. Prerequisite: MEE 251. Lec 2, Lab 3.

Cr 3.

**AEN 464 Instrumentation and Control Systems**

Analysis of dynamic measurement and control systems, involving temperature, force, content, strain, and fluid flow measurements in physical and biological systems. Prerequisite: PHY 122 and MAT 228 or permission. Lec 2, Lab 2.

Cr 3.

**AEN 465 Soil and Water Engineering**

Analysis of hydrologic processes and hydraulics related to runoff, flood control, and water resource development. Principles of and design procedures for earth dams, drainage, irrigation, and erosion control systems. Prerequisite: CIE 350 or MEE 360. Lec 2, Lab 3.

Cr 3.

**AEN 467 Agricultural Power**

Heat engine and electric power units for mobile and stationary application; power transmission; interactions between tractors, implements, and the ground; application of new energy sources to agricultural and power needs. Prerequisites: MEE 230. Lec 2, Lab 3.

Cr 3.

**AEN 469 Agricultural Process Engineering**

Analysis and design of unit operations such as size reduction, separation, heating, drying, refrigeration, and their applications to agricultural processing. Prerequisite: MEE 230 and MEE 360 or CIE 350 (may be taken concurrently). Lec 2, Lab 2.

Cr 3.

**AEN 491 Design Project I**

The first of a three-course sequence which gives a supervised design experience to upperclass AEN and FOE majors. This course will include lectures on design procedures and topics. The student will be required to choose a design project and project advisor during the semester. Lec 1.

Cr 1.

**AEN 492 Design Project II**

The second of a three-course sequence which gives a supervised design experience to upperclass AEN and FOE majors. This course will be taught as a tutorial where each student will carry out a design project in his or her field of interest. Lab 6.

Cr 2.

**AEN 493 Design Project III**

The third of three-course sequence which gives a supervised design experience to upperclass AEN and FOE majors. Successful completion of this course requires preparation of a written report suitable for submission to the ASAE engineering design competition and preparation and delivery of a one hour seminar on the student's design project. Rec 1.

Cr 1.

**AEN 497 Special Problems in Agricultural Engineering**

Independent study.

Cr Ar.

**AEN 550 Simulation of Biological and Physical Systems**

An introduction to modeling and simulating real life, time dependent, continuous systems. Examples from physiology, economics, water management, plant growth, population dynamics, and other fields are simulated on the digital computer using Fortran and 360/CSMP. Prerequisite: MAT 126 or equivalent, elementary Fortran. Lec 3.

Cr 3.

**Department of Entomology**

Professors Forsythe (Chairperson), Dimond, Osgood, Storch; Associate Professors Alford, K. E. Gibbs; Assistant Professors Drummond, Groden; Cooperating Professors Bentley, Knight; Cooperating Educator Dill; Faculty Associate Grimlbe, Jennings; Emeritus Professor Simpson.

**ENT 220 Insects, Science and Society**

A presentation of the insects and their close relatives designed to acquaint the non-biology major with our dependence on and interactions with insects. Insect structure, biology, effects on human health and food supplies and control strategies are discussed. Offered without lab. Lec 3.

Cr 3.

**ENT 226 Introductory Entomology**

Fundamental principles of insect life and the relation of insects to plants, animals, and man. Laboratory includes a study of structure, and systematics. An insect collection is required. (Offered in the fall semester only). Prerequisite: BIO 100. Lec 2, Lab 4.

Cr 4.

**ENT 228 Introductory Applied Entomology**

The course is an introduction to entomology with emphasis on regulating populations of pest insects and the fundamentals of insect biology which influence insect populations. Laboratory emphasized identification and sight recognition of insects of major economic importance to ornamental plants and field crops. Prerequisite: BIO 100. Lec 2, Rec 1, Lab 2. **Cr 4.**

**ENT 305 Problems in Entomology**

Open to juniors and seniors in any college who have special interest and qualifications in entomology. **Cr Ar.**

**ENT 449 Insect Pest Management**

The basic principles involved to reduce populations of pest insects. Biological, chemical, and other population suppression methods based on ecological considerations and systems management. Laboratory includes independent study, demonstrations, and selected readings of special topics. Prerequisite: ENT 226, ENT 227 or ENT 228. Lec 2, Lab 2. **Cr 3.**

**ENT 460 Insect Biology and Taxonomy**

Introduction to the orders and families of insects: their characteristics, evolution and biology. Laboratory emphasis is on identification of lower orders and Coleoptera. Prerequisite: ENT 226, ENT 227 or ENT 228 Lec 2, Lab 2. **Cr 3.**

**ENT 461 Insect Biology, Taxonomy and Systematics**

Characteristics and biology of Lepidoptera, Diptera, and Hymenoptera and the principles of modern systematics. Laboratory deals exclusively with the identification of native and exotic specimens within those three orders. Prerequisite: ENT 226, ENT 227 or ENT 228. Lec 2, Lab 2. **Cr 3.**

**ENT 505 Problems in Entomology** **Cr Ar.****ENT 511 Insect Ecology**

Ecological effects of biotic and abiotic factors on insects and on insect population ecology. Outside reading and field trips required. Prerequisite: Beginning course in ecology, and background in statistics, physiology and entomology or permission. Lec 2, Rec 1. **Cr 3.**

**ENT 530 Aquatic Entomology**

Aquatic stages of freshwater insects including distribution, biology, ecology and adaptation. Roles as food sources for fish and waterfowl and indicators of water quality emphasized.

Prerequisite: introductory entomology course or permission. Lec 2. **Cr 2.**

**ENT 531 Aquatic Entomology, Laboratory**

Emphasizes identification and sampling methods. Field trips and collection required. Prerequisite: introductory entomology course or permission. Lab 4. **Cr 2.**

**ENT 561 Seminar and Entomological Literature**

Required for entering students. The use of library indexes in manuscript preparation for scientific publication and methods of preparing materials for the presentation of biological data. Review of entomological literature on assigned topics and presentation. **Cr 2.**

**ENT 562 Seminar**

Review of entomological literature on assigned topics and its presentation. Subject area of seminar varies each semester. Course can be taken more than once for credit. **Cr 1.**

**ENT 570 Morphology, Physiology and Behavior of Insects I**

Lectures and laboratory exercises investigate the fundamental principles of insect systems in terms of structure and function. Prerequisite: ENT 226, ENT 227 or ENT 228 or permission. **Cr 1-3.**

**ENT 571 Morphology, Physiology and Behavior of Insects II**

Lectures and laboratory exercises investigate the fundamental principles of insect systems in terms of behavior patterns and physiological processes for the survival of individuals and populations. Prerequisite: ENT 570 or permission. **Cr 1-3.**

**Interdisciplinary Courses****INT 256 (BOT, ENT, FTY) Forest Protection**

Principles of forest protection involving disease, insects and fire with emphasis on understanding the identification, ecology, and control of tree pests. Prerequisites: BIO 100, BOT 233 or BOT 464. Lec 3, Lab 1. **Cr 4.**

**INT 380 (ENT, PSS) Pesticides and the Environment**

Study of the properties of pesticides and their fate in the environment. Emphasis will be on insecticides, fungicides and herbicides, application technology, governmental regulations, and environmental concerns. Prerequisite: One semester of biology or chemistry. Lec 3. **Cr 3.**

**INT 450 (BOT, ENT, PSS) Agricultural Pest Ecology**

An examination of the intrinsic and extrinsic principles of weed, plant disease, and insect pest interrelationships. Integrated pest management strategies and crop ecosystem models will be emphasized. Prerequisites: Must have completed an introductory course in two of the three pest sciences-PSS 403, BOT 456/457, or ENT 226/227/228 or permission. Lec 3.

Cr 3.

**Department of Food Sciences**

Professors R. Bushway, Slabyj; Associate Professors A. Bushway (Chairperson); Assistant Professor Schroeder

**FOS 298 Independent Studies**

Independent studies in restricted areas of food science: (1) special topics, (2) food chemistry, (3) food spoilage and fermentation, (4) food processing, (5) quality evaluation (6) food biochemistry. Prerequisite: Permission of department.

Cr Ar.

**FOS 301 Food Processing Industry Principles and Problems**

Scope of the food manufacturing industry, processing principles and practices discussed in relation to product quality and problems involved. Rec 3.

Cr 3.

**FOS 394 Cooperative Education in Food Science**

A regular program of approved work experience for which academic credit is given, alternated with academic coursework. Students are provided opportunities to integrate theory with practice, to gain practical work experience, and to develop future placement opportunities. Prerequisite: Junior standing and permission. (Pass/Fail Grade Only).

Cr 1-16.

**FOS 396 Field Experience in Food Science**

An approved work experience for which academic credit is given. Students may work part time or full time for a semester in an approved program of work experience which contributes to the academic major. Students have the opportunity to gain practical experience in a job related to their professional career goals. Prerequisite: junior standing and permission. (Pass/Fail Grade Only).

Cr 1-16.

**FOS 502 Food Processing I**

Thermal processing, freezing, dehydration and curing and smoking as applied to food production. Examine the effect of processing on qu-

ality as measured by chemical, microbiological, physical and sensory methods. Prerequisite: Permission of instructor.

Cr 4.

**FOS 503 Food Processing II**

Pasteurization, refrigeration, freeze drying, extrusion technology, chemical preservation and irradiation in the food industry. Examine the effect of processing on quality as measured by chemical, microbiological, physical and sensory methods. Prerequisite: Permission of instructor.

Cr 4.

**FOS 571 Food Science Graduate Seminar**

Review of literature, presentation of techniques, procedures and results in food science research.

Cr 1.

**FOS 581 Problems in Food Science**

Special topics - Opportunity is provided to pursue an individualized topic in the food science area.

Cr Ar.

**FOS 582 Food Chemistry**

Chemical changes that occur in food during processing and storage and the use of modern analytical instrumentation (GC and HPLC) to detect these changes.

Cr Ar.

**FOS 583 Food Microbiology**

Role and significance of microorganisms in food spoilage as related to sanitation, shelf life, and safety of foods - mechanisms of microbial fermentation in food processing, food preservation and beverage manufacture.

Cr Ar.

**FOS 585 Quality Evaluation**

Methods and techniques for sensory evaluation of foods. Selection of methods, material, design, questionnaire, and statistical analysis of the data. Application and correlation of objective and subjective testing methods.

Cr Ar.

**FOS 586 Food Biochemistry**

Biochemical changes that occur in food during processing and storage.

Cr Ar.

**FOS 587 Food Analysis**

Methods used to analyze food including nutrient composition and natural toxicants. Use of modern analytical instrumentation (GC and HPLC) is stressed.

Cr Ar.

**Interdisciplinary Courses****INT 265 (ANV, FOS) Meat Technology**

The basic science of meat and meat processing, packinghouse methods and cutting of meat. Rec 2, Lab 2.

Cr 3.

**INT 438 (FOS, MCB) Food Microbiology**

Importance of microorganisms in food pro-

cessing, spoilage, and preservation. Role of microorganisms in fermentation and production of protein, enzymes, and other products. Food as vehicle of infection and intoxication. Lec 3, Lab 4. **Cr 4.**

## Department of Plant and Soil Sciences

Professors Langille (Chairperson), Erhardt, Glenn, Holyoke, Smagula; Associate Professors Fernandez, Goltz, Mitchell, Reeves, Zibilske; Assistant Professors Cappiello, Liebman, Porter, Schupp, Stack, Wiedenhoft; Senior Soil Scientist Rourke; Faculty Associates Clapham, Honeycutt, LaFlamme, Litton, Merrick, Ohno.

### **PSS 100 Plant Science**

Response of agricultural crops to environmental factors such as moisture, temperature, light and soil fertility. Effects of weeds, diseases and insect pests on plant growth are also discussed. Prerequisite: BIO 100 or permission. Lec 3, Lab 2. **Cr 4.**

### **PSS 101 Cropping Systems**

Principles and practices of various cropping systems involve agricultural crops. Includes weekly guest lecturers discussing major species of the Northeast. Prerequisite: PSS 100 or permission. Lec 4. **Cr 4.**

### **PSS 105 Principles of Sustainable Agriculture**

Basic design principles and examples of environmentally and economically sustainable agricultural systems. The course will describe the use of synthetic fertilizers and pesticides, but emphasis will be placed on identifying management practices that a) biologically improve soil structure, organic matter content, and fertility; and b) minimize or eliminate the need for chemical interventions for control of insect pests, pathogens, and weeds. Lec 3. **Cr 3.**

### **PSS 110 Horticulture**

General horticultural principles and practices as related to fruits, vegetables and ornamentals. Emphasis on biological, environmental and cultural aspects of horticulture. Lec 3. **Cr 3.**

### **PSS 112 The Home Garden-Vegetables and Fruits**

The small scale, intensive culture of the vegetable and fruit plants ordinarily grown in northern gardens. Alternative management

and cultural techniques are discussed and evaluated. Lec 3. **Cr 3.**

### **PSS 120 Herbaceous Landscape Plants**

The principles and practices of growing and using herbaceous plants in the landscape. Emphasis on identification, selection, landscape use and plant culture. Lec 2, Lab 2. **Cr 3.**

### **PSS 124 Greenhouse Management**

Management of greenhouse facilities and production of floricultural crops. Emphasis on structures, business management, and crop production and marketing. Lec 3, Lab 2. **Cr 4.**

### **PSS 126 Agrostology**

The identification, establishment, fertilization, mowing, pest control, and soil requirements of grasses suitable for use on lawns, golf courses, athletic areas, cemeteries parks and low maintenance areas. Lec 3. **Cr 3.**

### **PSS 127 Landscape Construction**

Introductory analysis of construction materials and methods of construction of landscape projects. Emphasis on functional and aesthetic properties of materials and construction methods used in common landscape construction practice. Topics covered: grading, drainage, retaining walls, tree wells, stairs, terraces, decks, visual screens, fences, paving materials and site structures. Studio 2, Lec 2. **Cr 3.**

### **PSS 130 Floral Design: Retail Shop**

Demonstrations, work sessions showing the basic practices in a flower shop, taping, wiring, vase arrangements, corsage, wedding and funeral designs. Fresh and dried flowers will be used. Prerequisites: Permission. Lab 2. (Pass/Fail Grade Only). **Cr 1.**

### **PSS 131 Floral Design: Home**

Design labs will emphasize the use of flowers in the home. Introducing the basic elements and principles in flower design, the care and storage of cut flowers. Fresh, silk, and dried materials will be used. Prerequisite: Permission. Lab 2. (Pass/Fail Grade Only). **Cr 1.**

### **PSS 140 Soil Science**

The chemical, physical and biological properties of soil. Also considers origin, management and interrelationships of soils to plant growth. Prerequisite: CHY 111 or BCH 207. Lec 3, Lab 2. **Cr 3-4.**

### **PSS 142 Soil Judging**

Methods of describing and interpreting soil properties for urban, agricultural, recreational

and other uses are developed. Various landscapes will be judged. Soil judges will compete in the annual regional soil judging competition. A course fee of \$100 for each student. Prerequisites: PSS 140 or PSS 150. Rec and Lab 1. (Pass/Fail Grade Only). **Cr 1.**

#### **PSS 144 Soil and Water Conservation**

Management of soil and water resources in accordance with the multiple use concepts. Problems of erosion and water pollution are also dealt with. Rec 2. **Cr 2.**

#### **PSS 146 Land Use Planning-Soil Aspects**

A consideration of basic soil characteristics and properties as they influence land use and aid local and regional planning. Rec 2. **Cr 2.**

#### **PSS 150 Forest Soil Science**

Fundamentals of soil science including the study of development, properties, and management of soils and the interrelationships of soils to forest growth. Prerequisite: CHY 111. Rec 2, Lab 2. **Cr 3.**

#### **PSS 221 Woody Landscape Plants I**

The study of woody plants suitable for landscape use in New England. Emphasis will be placed on plant identification and general characteristics. Prerequisite: PSS 110, equivalent or permission. Lec, Lab 2. **Cr 3.**

#### **PSS 223 Nursery/Garden Center Operations**

The principles and practices involved with plant propagation, production, marketing and sales as seen from the landscape horticulture industry perspective. Emphasis will be placed on production systems and nursery/garden center business management. Prerequisites: PSS 110, equivalent or permission; PSS 140. Lec 2, Lab 2. **Cr 3.**

#### **PSS 225 Landscape Graphic Communication**

The study of landscape graphics as a form of communication. Two three hour studios with up to one hour of studio work devoted to group presentation meetings, instructions and review of new techniques such as drafting, lettering, free hand drawing, section and elevations, concept diagraming, plan graphics and three-dimensional drawing techniques. Prerequisite: PSS 110, equivalent or permission. Studio 6. **Cr 3.**

#### **PSS 248 Soil Organic Matter and Fertility**

Fundamental aspects of soil organic matter management. Principles of plant residue decomposition and the environmental and ag-

ricultural implications of human intervention in this process. Prerequisites: CHY 111, CHY 112; PSS 140. Lec 3, Lab 1. **Cr 4.**

#### **PSS 328 Landscape Design**

The principles of landscape design as applied to design analysis, areas and circulation, land forms, construction, planting design, specifications, estimating and presentation. Also considers the application of design. The aesthetic, functional and horticultural principles to the composition of the planted landscape and the development of landscape plans. Prerequisite: Junior standing in LHC or permission. Lec 2, Lab 2. **Cr 3.**

#### **PSS 370 Senior Seminar in Plant and Soil Sciences**

Review of literature, problems, and research as related to the areas of plants and soils. Rec 1. **Cr 1.**

#### **PSS 394 Cooperative Education in Plant and Soil Science**

A regular program of approved work experience for which academic credit is given, alternated with academic coursework. Students are provided opportunities to integrate theory with practice, to gain practical work experience, and to develop future placement opportunities. Prerequisite: junior standing and permission. (Pass/Fail Grade Only). **Cr 1-16.**

#### **PSS 396 Field Experience in Plant and Soil Science**

An approved work experience for which academic credit is given. Students may work part time or full time for a semester in an approved program of work experience which contributes to the academic major. Students have the opportunity to gain practical experience in a job related to their professional career goals. Prerequisite: junior standing and permission. (Pass/Fail Grade Only). **Cr 1-16.**

#### **PSS 397 Problems in Plant and Soil Sciences**

Opportunity is provided for specialization in specific areas of plant and soil sciences. **Cr Ar.**

#### **PSS 400 Bioclimatology**

An introduction to forces governing weather and climate. Interrelationships of atmospheric and biological processes and solutions to problems of plant and animal responses to the microclimate. Prerequisite: PHY 111 and 112, MAT 126 or permission. Rec 3. **Cr 3.**

**PSS 401 Advanced Crop Management**

Production practices for specific agricultural crops important to Maine. Students may register for one or more of the following sections. Section 01-Fruits. Scientific principles and practices used in the production of fruit crops. The culture of fruits adapted to the Northeast with emphasis given to apples and blueberries. Section 02-Vegetables. The important vegetable crops, emphasizing their characteristics and culture with consideration given their adaptation to local soil and climatic conditions. Section 03-Forages. The practices important in grazing management and the production of growing forage grasses, legumes, and silage corn. The principles of forage preservation will also be studied. Section 04-Potato. Production practices of potatoes for tablestock, processing and seed. Prerequisite: PSS 100 or PSS 101 or permission. **Cr 3.**

**PSS 403 Principles of Weed Control**

Principles and practices of controlling weeds in agricultural crops and in non-crop areas. Emphasis on chemical methods. Functions, equipment and recommendations for herbicides. Prerequisites: BIO 100 and PSS 100 or permission of instructor. Rec 3. **Cr 3.**

**PSS 410 Plant Propagation**

Principles and methods involved in the propagation of herbaceous and woody plants by seeds, division, layering, cutting, budding, grafting, and tissue culture. Prerequisites: BOT 453 and BOT 452 or permission. Rec 2, Lab 2. **Cr 3.**

**PSS 425 Landscape Management**

The principles and practices of operating a landscape maintenance landscape contractor business. Topics covered will include, setting up a new business, site analysis, labor analyses, bidding and estimating, development of maintenance plans and contracts, and customer/employee relations. The student will be expected to draw on previous experience and instruct in the areas of plant materials, landscape design, soil management and general horticultural principles. Prerequisite: Senior standing in LHC or permission. Lec 2, Lab 2. **Cr 3.**

**PSS 428 Landscape Design Problems**

The practical and theoretical principles of landscape design as they are applied to common problems. Emphasis is on exposure and awareness in the area of landscape design. Pre-

requisites: PSS 120, PSS 122 and PSS 128 or permission. Rec 2, Lab 2. **Cr 3.**

**PSS 429 Park Planning and Design**

Basic planning and design principles of space, scale and circulation applied to recreation areas and park facilities with special emphasis on visitor use. Prerequisite: junior, senior RPM majors. Rec 2, Lab 2. **Cr 3.**

**PSS 440 Soil Chemistry and Plant Nutrition**

Origin and nature of soil chemical properties and their effects on plant growth. The source and function of essential nutrients needed for plant growth. The chemistry of fertilizer and lime reactions in soils. The major emphasis will be on agronomic systems; however, depending on students' interests discussion will also include horticultural crops and forest ecosystems. Prerequisite: PSS 140 or PSS 150 and CHY 112 or CHY 114. Lec 3, Lab 3. **Cr 4.**

**PSS 442 Soil Taxonomy**

Taxonomy and classification of soils. Prerequisites: PSS 140 or PSS 150 and GES 101, GES 541; junior, senior or graduate standing. Rec 2, Lab 3. **Cr 3.**

**PSS 444 Soil Morphology and Soil Mapping**

Soil profile description and soil map construction taught in an intensive 3 week course. Prerequisites: PSS 140 or PSS 150, PSS 442. Lab 6. **Cr 3.**

**PSS 447 Physical Properties of Soils**

An intensive consideration of the physical properties of the soil and their effect on plant growth. Prerequisites: PSS 140 or PSS 150 and PHY 111 and PHY 112 and MAT 126. Rec 3, Lab 3. **Cr 4.**

**PSS 448 Soil Microbiology**

Soil-inhabiting microorganisms and the important processes they mediate (organic matter decomposition, transformations and cycling of nitrogen, sulfur, phosphorus and other elements). Prerequisite: BCH 221 or permission. Rec 3, Lab 2. **Cr 4.**

**PSS 477 Advanced Studies in Crop Science I (Study Area)**

Comprehensive study of basic practices in production of agricultural crops. Discussion of selected readings. Register for one or more of optional areas, including (1) apple production, (2) forage management, (3) potato production, (4) sustainable agriculture. Prerequisite: PSS 100 or PSS 101 or permission. **Cr 3.**

**PSS 479 Crop Physiology**

Bridges the gap between ecology and process physiology. Concern centers on understanding the ways in which various processes are integrated to produce the response shown by whole plants when grown as a community. Prerequisites: PSS 100, BOT 452 or permission. Rec 3, Lab 1. **Cr 4.**

**PSS 501 Plant Growth Regulators**

Concepts and techniques in the study of plant growth and development with emphasis on phytohormones and synthetic growth substances in relation to economic plants. Prerequisite: BOT 452. Rec 2, Lab 2. **Cr 3.**

**PSS 503 Post-Harvest Physiology**

Biochemical and physiological processes associated with ripening and keeping quality of harvested plant products. Includes temperature, humidity, growth regulators, types of storage, handling and physiological disorders. Prerequisites: BOT 452 and BOT 453 or permission. Rec 2, Lab 2. **Cr 3.**

**PSS 505 Mineral Nutrition of Plants**

History of plant nutrition, plant composition and function of essential elements, mechanisms of uptake, movement and distribution. Also a list of optional topics chosen by the class which includes: mineral nutrient budgets, mineral nutrition and plant breeding and mineral nutrition and plant ecology. Prerequisites: BOT 452 and BOT 453 or permission. Rec 3. **Cr 3.**

**PSS 509 Experimental Design**

Principles of research in biological sciences, design of experiments, statistical analysis and interpretation of data. Prerequisite: Permission. Rec 3, Lab 2. **Cr 4.**

**PSS 546 Chemistry of Soils**

Composition and chemical transformation in soils, soil-solution equilibria considerations, soil profile development, and ion-exchange phenomena in soils. Prerequisites: PSS 140, PSS 440, and CHY 240 or permission. Rec 2, Lab 4. **Cr 4.**

**PSS 548 Rhizosphere Microbiology**

A study of microbial activities, excluding pathogenesis, in the plant root environment. Prerequisite: PSS 448 and BOT 454 or permission. Rec 3, Lab 3. **Cr 4.**

**PSS 570 Graduate Seminar in Plant and Soil Sciences**

A presentation of literature reviews, research, methodology and research progress before a critical audience of peers and faculty. **Cr 1.**

**PSS 597 Special Topics in Plant and Soil Sciences**

Advanced study of plant and soil related topics. Prerequisite: permission. **Cr Ar.**

**Interdisciplinary Courses****INT 143 (PSS) Tropical Agriculture**

A consideration of the characteristics and problems of the soils, plants, and animals of the tropics. Programs and methods for stimulating their potential productivity will be explored. Rec 3. **Cr 3.**

**INT 380 (ENT, PSS) Pesticides and the Environment**

Study of the properties of pesticides and their fate in the environment. Emphasis will be on insecticides, fungicides and herbicides, application technology, governmental regulations, and environmental concerns. Prerequisite: One semester of biology or chemistry. Lec 3. **Cr 3.**

**INT 444 (ARE, PSS) Integrated Farming Systems**

This course is designed to be a capstone to the Sustainable Agriculture Program. Students, in conjunction with the faculty instructors, will integrate the material taught in the various agriculture courses required of Sustainable Agriculture majors. The course will constitute an integration of the physical, economic, social and philosophical aspects of agricultural production. Prerequisites: PSS 100, PSS 140, ARE 148, and ARE 453 or equivalents. Lec 3, Lab 1. **Cr 4.**

**INT 445 (PSS) Agricultural Ecology**

An examination of inter-related biological, technological and socio-economic factors affecting agricultural production and sustainability in developed and developing countries. Extensive reading, oral presentations, and a written project are required. Prerequisites: PSS 105 or permission. **Cr 3.**

**INT 450 (BOT, ENT, PSS) Agricultural Pest Ecology**

An examination of the intrinsic and extrinsic principles of weed, plant disease, and insect pest interrelationships. Integrated pest management strategies and crop ecosystem models will be emphasized. Prerequisites: Must have completed an introductory course in two of the three pest sciences-PSS 403, BOT 456/457, or ENT 226/227/228 or permission. Lec 3. **Cr 3.**



## College-wide Courses

### FAA 117 Issues and Opportunities

The course will consist of several general meetings conducted by the Associate Dean, and one weekly small group session (usually of 10 or fewer students) conducted by the students' freshman advisor. (Pass/Fail Grade Only).

Cr 1.

### NRC 100 Introduction to Natural Resources

This course will provide an introduction to resource issues and an initial framework for problem analysis, management consideration, and policy development in natural resources. The course will be presented by an interdisciplinary team of faculty members.

Cr 3.

### NRC 200 Sophomore Seminar in Natural Resources

Current issues in natural resource utilization, management, and policy will be discussed critically. Students will be exposed to outside speakers from various professions concerned with natural resources.

Cr 1.

### NRC 300 Junior Seminar in Natural Resources

Issues in natural resources will be examined from the perspective of particular agencies and legislative bodies involved with the utilization and management of natural resources. Class discussions will focus around presentations by outside speakers representing these agencies.

Cr 1.

### NRC 400 Senior Paper in Natural Resources

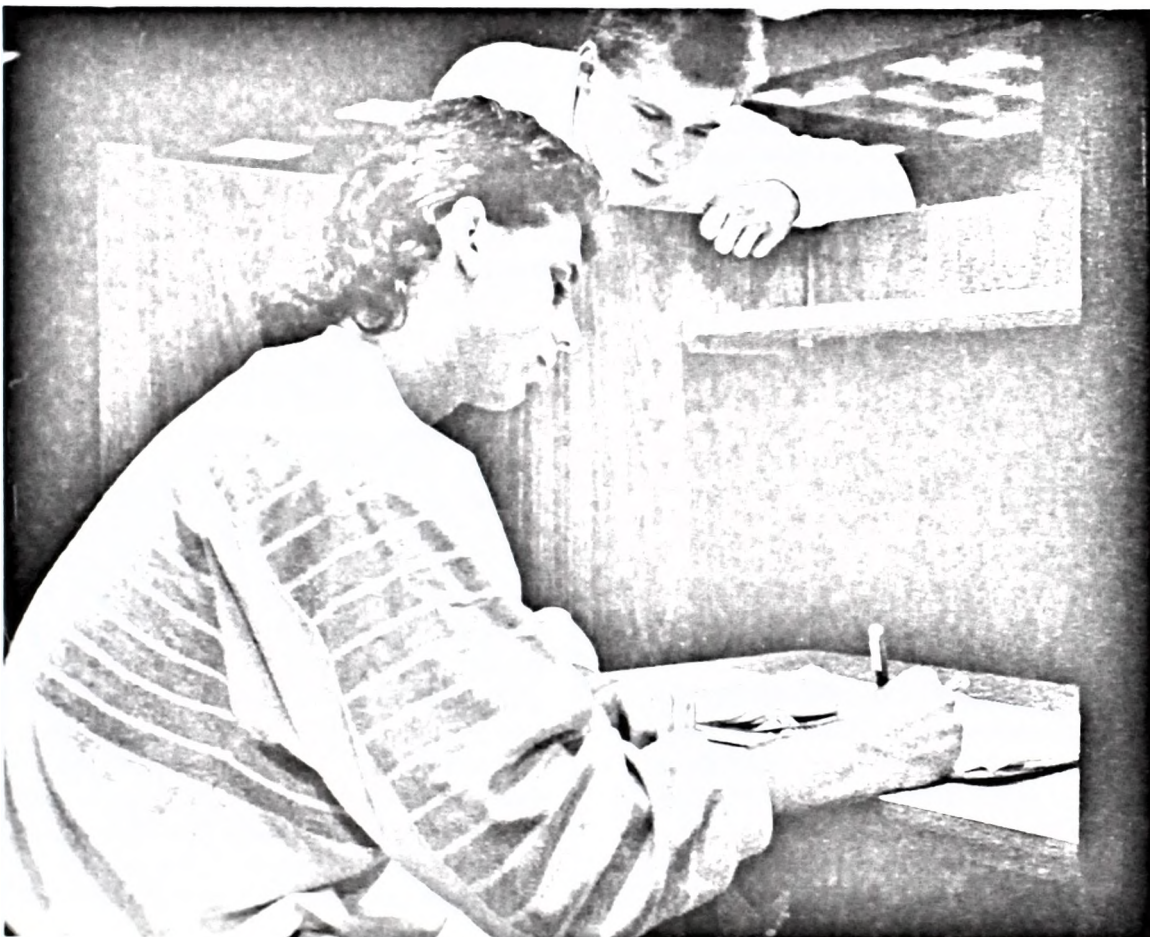
Students in this independent-study course will select a problem in natural resource utilization, management, or policy, and will prepare a detailed research paper on the topic. Each student will work closely with one of the program faculty in natural resources.

Cr 1-3.

### NRC 489 Critical Issues in Natural Resource Policy

Current and historically important issues in natural resource management and conservation are evaluated by teams of students and faculty. Interdisciplinary approaches to problem analysis are stressed, with special attention to the ways scientific information and management options affect policy.

Cr 2.



## Special Programs and Minors

### Honors Program

The Honors Committee of the College of Applied Sciences and Agriculture consists of J. Delphendahl, J. Dimond, M. Gershman (Secretary), S. Goltz, R. Milardo, R. Rowe, and B. Slabyj.

Freshmen of marked academic ability are invited to apply to the secretary for admission to the sequence of honors courses listed here. The work of the freshman and sophomore years, under the direction of staff drawn from all colleges of the University, provides the stimulus and guidance which should enable a superior student to begin building a perspective of the liberal arts and sciences and to lay a foundation for more specialized work to come. The Honors Program climaxes in a research project and thesis to be written during the senior year, that treats some special area within the student's major field. Students may be admitted at any stage of the Honors Program up to the end of the sophomore year. Of the courses listed below, HON 101 (Honors Seminar I), 102 (Honors Seminar II), 301 (Honors Group Tutorial I), and 302 (Honors Group Tutorial II) are taken in common with students from other colleges within the University. These courses, plus HON 397 (Honors Specialized Study), 498 (Honors Directed Study), and 499 (Honors Thesis) constitute the core of the program.

Additional information about the Honors Program and a full description of courses may be found elsewhere in this catalog.

HON 101 or 102 meets the ENG 101 requirements of the College of Food, Agriculture and Applied Sciences. HON 101, 102 and HON 301, 302 may be used to meet up to nine hours of the humanities and social sciences requirements of the college. Any honors course meets the free elective requirements in any program of study.

### Cooperative Program with Bangor Theological Seminary

Regularly enrolled students in the College of Applied Sciences and Agriculture may register for courses at the Bangor Theological Seminary, not to exceed six credit hours per semester, without paying additional fees. The college extends a like privilege to students regularly enrolled at the seminary. All registrations must

have the approval of the academic deans of both institutions and the instructors involved. Credit for courses so taken will be considered a part of the student's program at the institution where enrolled.

While enrolled at the seminary a student may, with approval of his or her dean and the Admissions Office of the University, also register as a special student in the College of Applied Sciences and Agriculture on the established fee basis for such courses. Work so taken, if it does not duplicate courses taken in the Seminary program, may be counted as advanced standing credit toward the degree in the event a student later registers for a degree program at the University.

### Minors

A *Minor* is a secondary specialization in a discipline or in a formal interdisciplinary program which complements or augments the *Major* program. Students choosing to take a minor usually do so either to strengthen their preparation in the major program or to prepare themselves for a broader range of career opportunities. Once all of the requirements of the minor program are met, the Associate Dean's office will certify to the Registrar that the minor has been completed. The Registrar will add the words *Minor in Foods and Nutrition* (for example) to the student's official university transcript.

Minors are strictly optional: you are not required to complete a minor if you are majoring in a program in Applied Sciences and Agriculture. If you do decide to complete a minor, the requirements of the minor are in addition to the specific requirements of your major. The specific requirements for each approved minor are detailed in the pages that follow, but all require at least 15 credit hours of courses above the introductory level. Most students who take a minor use their free elective credits to accommodate the requirements of the minor program. Thus, in most cases it is not necessary to take more than 120 credits to complete a minor.

If you decide to work towards a minor program in addition to the major, you need to visit the Associate Dean's Office, 106 Winslow Hall, to declare your intentions. If this is not done, we cannot guarantee that proper certification

of the minor will appear on the transcript. If you should begin work on a minor but fail to meet all of the requirements, there is no penalty: no reference to the minor will appear on the transcript.

If you are majoring in a program in another college at the University of Maine, check with that college regarding their regulations on minors. Some colleges do not recognize minors; other do, but may not recognize all of the programs listed here.

## Agricultural Sciences

(27 credits)

The minor in Agricultural Sciences requires the 12 credits of introductory courses in the agricultural sciences listed below, plus an additional 15 credits of upper level courses selected from the following departments:

Courses selected to meet the requirement for upper level courses may not duplicate courses required in the major program.

Required Introductory Courses:

ANV 145 Animal Science

PSS 140 Soil Science

PSS 100 Crop Science

ARE 148 Principles of Agricultural Economics

## Agribusiness and Resource Economics

(18 credits)

The requirements for the minor in Agribusiness and Resource Economics include:

A course in Economics (ARE 148 or ECO 110) Plus the following required core of courses:

ARE 458 Principles of Management in Agribusiness

ARE 459 Agricultural Business Finance

ARE 465 Food and Fiber Marketing OR

ARE 471 Resource Economics

Plus two courses selected from the following list:

ARE 454 Introduction to Production Economics

ARE 468 Price Analysis and Forecasting

ARE 474 Land Use Planning

ARE 486 Government Policies Affecting Rural America

ARE 453 Farm Management

ARE 518 Mathematical Optimization Techniques

ARE 554 Production Economics

ARE 565 Marketing Theory and Concepts in Agribusiness

ARE 577 Economics of Public Choice

INT 324 Contemporary Rural Problems

## Animal and Veterinary Sciences

(19-21 credits)

Prior to enrolling in the minor in Animal and Veterinary Sciences, the student must consult with the chairperson of the department to select the option most appropriate to background and career goals, and to arrange any course substitutions which may be appropriate.

The requirements for the minor in Animal and Veterinary Sciences include:

ANV 145 Animal Science

Plus, the student selects one of the two options detailed below.

### Animal Industry Option

Select *two* courses from the following list:

ANV 346 Dairy Cattle Technology

ANV 347 Equine Science

ANV 348 Livestock Management

ANV 385 Poultry Technology

Select an *additional two* courses from the following list:

ANV 480 Physiology of Reproduction

ANV 461 Advanced Animal Breeding

ANV 456 Applied Animal Feeding

ANV 437 Animal Diseases

Plus *one* of the following two courses:

INT 265 Meat Technology

FOS 301 Food Processing Industry Principles and Problems

### Animal Sciences Option

Select *one* course from the following list:

ANV 346 Dairy Cattle Technology

ANV 348 Livestock Management

ANV 385 Poultry Technology

Plus *four* courses from the following list:

ANV 437 Animal Diseases

ANV 455 Animal Nutrition

ANV 456 Applied Animal Feeding

ANV 480 Physiology of Reproduction

ANV 461 Advanced Animal Breeding

ANV 472 Endocrinology

## Botany

(19-20 credits)

The minor in Botany is designed for non-majors who would like to develop a basic understanding of the structure, function, and diversity of plants. The requirements for the minor in botany include the following four courses:

BOT 203 The Plant Kingdom  
 BOT 435 Plant Anatomy  
 BOT 452 Plant Physiology  
 BOT 453 Plant Physiology Lab  
 BOT 464 Taxonomy of Vascular Plants

In addition, the minor includes an additional 3-4 credits in BOT courses numbered above the introductory level. Please note that the minor in botany is not open to students majoring in biology.

## Chemistry

(15 credits)

The requirements for the minor in Chemistry include completion of at least 15 credits of CHY courses at the 200 level or above, which may include up to three credit hours of undergraduate research in Chemistry.

In order to maintain maximum flexibility in meeting a student's needs, the minor in Chemistry has no specific course requirements. Each student's minor program shall be formulated in consultation with, and approved by, a Chemistry faculty advisor. The approved program will be filed with the office of Associate Dean, Food, Agriculture and Applied Sciences, at the time the student formally declares an intention to pursue the minor in Chemistry.

## Computer Science

(15 credits)

The requirements for the minor in Computer Science include:

COS 220 Introduction to Computer Science I  
 COS 300 Introduction to Computer Science II  
 COS 330 Computer Architecture and Assembly Language

Plus any two additional COS courses at the 300 level or above.

## Education

(22 credits of professional courses)

The minor in Education is designed to prepare students in the life sciences or agricultural

sciences to become certified to teach in Maine secondary schools. Students majoring in one of the life sciences meet all science subject matter requirements as a part of their regular programs. Students majoring in the agricultural sciences (such as animal science, for example) may need to take additional science courses to meet science certification requirements. Students seeking certification as agriculture teachers must complete 18 credits of technical courses from the curriculum described below.

Teacher certification for Maine is awarded by the Maine Department of Educational and Cultural Services. Applicants for certification must be graduates of an approved curriculum and must take the National Teachers Exam.

All students planning a minor in education must consult the College of Education early during their program. This is important so that a student teaching placement can be arranged, and so that students can plan their schedule to accommodate student teaching within their major program. In some cases it may be necessary to extend a program by one semester to complete the student-teaching requirement. However, with careful planning early in the program, it may be possible to complete the program in eight semesters.

The requirements for the minor in Education include:

PSY 100 General Psychology\*  
 EDB 202 The American School\*  
 EDB 204 The Teaching Process  
 EDB 221 Educational Psychology\*  
 EDG 500 Field Observation  
 ESC 452 Teaching Science in the Secondary School  
 STT 4XX Student Teaching (Secondary)

Courses marked by an asterisk(\*) may be counted toward meeting the ASA humanities/social sciences requirement.

## Agricultural and Natural Resource Education

(18 additional credits)

Students interested in the curriculum in Agricultural and Natural Resources Education should consult the coordinator, Professor Rhoads, in 106 Winslow Hall.

The curriculum in Agricultural and Natural Resource Education is offered as a minor within the following major programs: Sustainable Agriculture, Agribusiness and Resource Economics, Animal and Veterinary Sciences, Forestry, and Landscape Horticulture.

In addition to the 22 credits of professional education courses listed above, students must complete a minimum of 18 credits of technical courses outside the major. Thus, the total program requires 40 credits, 9 of which count for humanities/social sciences and 31 of which count as elective courses within the student's major.

The 18 credits of technical courses must consist of six credits in each of three disciplines outside the major, selected from a list of approved courses in the following areas: Agricultural Mechanization Agribusiness and Resource Economics Animal and Veterinary Sciences Forestry Plant and Soil Sciences

Students completing this program may apply for certification as a general agriculture teacher. Certification as a vocational teacher requires, in addition, appropriate agricultural experience.

## Entomology

(19 credits)

The requirements for the minor in Entomology include:

ENT 226 Introductory Entomology  
 ENT 440 Insect Biology and Taxonomy  
 ENT 449 Economic Entomology

Plus an additional eight credits selected from the following list:

ENT 247/248 Problems in Entomology  
 ENT 443 Forest Insect Ecology  
 ENT 449 Economic Entomology  
 ENT 453 Biology and Taxonomy of Advanced Orders  
 ENT 511 Insect Ecology  
 ENT 541 Medical Entomology  
 ENT 530 Aquatic Entomology  
 ENT 551 Morphology of Insects  
 ENT 561/562 Seminar

## Foods and Nutrition

(18 credits)

The courses which make up the minor in Foods and Nutrition are to be selected from the following approved list in consultation with a member of the nutrition faculty. Courses will be chosen to complement each student's academic background and to further individual career goals. While the minor is open to all students, it may be of particular interest to students majoring in biology, child development, physical education, or special education. The

minor *does not* lead to credentialing in the field of dietetics without further study.

The courses from which the minor in Foods and Nutrition is selected include:

HNF 101 Introduction to Food and Nutrition  
 AND  
 HNF 102 Introduction to Food and Nutrition Laboratory (prerequisites for all other HNF courses)  
 HNF 103 Family Food Management  
 HNF 200 Food Service Systems Management I  
 HNF 201 Food Service Systems Management II  
 HNF 330 The Science of Food Preparation  
 HNF 270 World Food and Nutrition  
 HNF 401 Community Nutrition Education  
 HNF 280 Human Nutrition for the Health Professions  
 HNF 301 Nutrition and Growth  
 HNF 471 Recent Advances in Food and Nutrition  
 HNF 398 Special Problems in Food and Nutrition

## Foreign Languages

(18 credits)

Minors in French, German, Latin, Russian and Spanish consist of a minimum of *18 credit hours in the chosen language above the elementary level courses.*

## Geology

(18 or 20 credits)

The requirements for the minor in Geology include:

GES 101 Aspects of Natural Environment I  
 OR

GES 106 Geology for Engineers

Plus the following courses:

GES 102 Aspects of the Natural Environment II

GES 311 Minerology

GES 312 Introduction to Petrology

Plus an upper level geology elective.

## History

(18 credits)

The requirements for the minor in History include:

HTY 103 United States History I

HTY 104 United States History II

HTY 105 History of European Civilization I  
 HTY 202 Medieval Civilization  
 HTY 278 American Military History  
 HTY 492 Technology and Society Since 1800

## Journalism

(24 credits)

The requirements for the minor in Journalism include:

JBR 100 Introduction to Mass Communication

Plus the following core of courses:

JBR 231 Reporting and Newswriting

JBR 232 Public Affairs Reporting

JBR 375 Mass Media Law and Ethics

JBR 430 Copy Editing

JBR 431 Newspaper Laboratory I

JBR 432 Newspaper Laboratory II

JBR 489 Seminar in Journalism

## Marine Resources

(18 credits)

Professor Robert Bayer, Coordinator

The minor in Marine Resources is designed for students in the College of Applied Sciences and Agriculture and the College of Sciences who wish to apply the knowledge and skills developed through their major programs to the problems of the marine environment. The minor consists of a common core plus two options (marine technology and marine resource utilization).

The requirements for the minor in Marine Resources include (prerequisites for courses are listed in parentheses):

ANV 220 Topics in Marine Resources

OCE 370 Introduction to Oceanography (permission)

ARE 471 Resource Economics (ARE 148 or ECO 110) OR

INT 360 Economics and the Biology Marine Fish Management (ECO 110)

Plus *ten* or more credit hours of courses from the following option lists, chosen to include at least *two* courses from one of the two areas of specialization.

### Marine Resource Utilization

INT 319 Ecology (BIO 100)

ARE 171 Economics of Environmental Quality

ARE 577 Economics of Public Choice (ECO 420)

MCB 520 Fish Diseases (ZOL 204, MCB 300

or permission)

ANV 212 Maine Mariculture (ZOL 353)

ANV 211 Aquaculture

ANV 409 Shellfisheries Biology (ZOL 443, or permission)

ZOL 470 Fishery Biology (ZOL 331, a course in ecology)

ZOL 573 Fisheries Science (ZOL 470)

BOT 473 Biology of Algae (BIO 100, BOT 203

BOT 475 Algal Growth and Seaweed Mariculture (BIO 100, BOT 203, and one year of chemistry or permission)

BOT 503 Natural History and Ecology of Marine Algae (BOT 473, a course in ecology)

### Marine Technology Option

AEN 469 Agricultural Process Engineering (MEE 230, 360)

AEN 550 Simulation of Biological and Physical Systems (MAT 126, knowledge of FORTRAN)

CIE 458 Coastal Engineering (CIE 350)

CIE 558 Advanced Coastal Engineering (CIE 458, MAT 259)

CIE 559 Numerical Modeling of Lake and Estuarine Processes (MAT 259)

In addition to the courses listed above, co-op education courses and special problem courses (available through the individual departments in ASA) may be included in the total credit hours of courses beyond the core. *However, inclusion of these courses requires the advance written approval of the Coordinator of the Concentration in Marine Resources.*

## Mathematics

(18-20 credits)

The requirements for the minor in Mathematics include:

MAT 127 Analytic Geometry and Calculus

MAT 228 Analytic Geometry and Calculus

MAT 259 Differential Equations OR

MAT 434 Introduction to Statistics

MAT 262 Linear Algebra

OR

MAT 351 Introduction to Vector and Tensor Analysis

Plus *one* course selected from the following list:

MAT 262 Linear Algebra (if not selected to meet requirements listed above)

MAT 434 Introduction to Statistics

MAT 435 Introduction to Mathematical Statistics

MAT 439 Regression and Analysis of Variance

MAT 487 Numerical Analysis

## Philosophy

(15 credits)

The requirements for the minor in Philosophy consist of the following:

PHI 410 History of Ancient Philosophy

OR

PHI 412 History of Modern Philosophy

Plus an additional 12 credits of PHI courses, at least 9 credits of which shall be courses above the 100-level.

## Physics

(23 credits)

The requirements for the minor in Physics include:

PHY 111/121 General Physics I

OR

PHY 112/122 General Physics II

PHY 236 Introductory Modern Physics

PHY 238 Mechanics

Plus *three* courses chosen from the following list:

PHY 441 Electricity and Magnetism I

PHY 447 Biophysics

PHY 462 Heat and Thermodynamics

PHY 470 Nuclear Physics

PHY 472 Optics

## Plant and Soil Sciences

(17-22 credits)

The Department of Plant and Soil Sciences offers minors with concentrations in landscape horticulture, plant science, and soil science. Each minor consists of a core of required courses plus a group of elective courses from which the student chooses three.

The requirements for the minor in Landscape Horticulture include:

BIO 100 Basic Biology

PSS 110 Horticulture

PSS 140 Soil Science/Laboratory

Plus two courses from the following list:

PSS 124 Greenhouse Management

LNM 123A Nursery/Garden Center Operation

PSS 128 Landscape Design

Plus one course from the following list:

PSS 120 Herbaceous Landscape Plants

PSS 122 Woody Landscape Plants

Plus one additional course selected either from the list above or from the following list:

PSS 410 Plant Propagation

BOT 201/202 Plant Biology

BOT 452/453 Plant Physiology

BOT 457 Plant Pathology

BOT 464 Taxonomy of Vascular Plants

ENT 226 Introductory Entomology

The requirements for the minor in Plant Science include:

BOT 452 Plant Physiology

PSS 100 Crop Science

PSS 101 Crop Management

PSS 370 Seminar in Plant and Soil Sciences

Plus one course from the following list:

BOT 464 Taxonomy of Vascular Plants

PSS 400 Bioclimatology

PSS 401 Advanced Crop Management

PSS 403 Principles of Weed Control

PSS 410 Plant Propagation

PSS 440 Soil Fertility

Plus two additional courses selected either from the list above or from the following list:

PSS 110 Horticulture

PSS 120 Herbaceous Landscape Plants

PSS 122 Woody Landscape Plants

PSS 124 Greenhouse Management

PSS 126 Agrostology

PSS 128 The Art of Home Landscaping

The requirements for the minor in Soil Science include:

PSS 144 Soil and Water Conservation

PSS 146 Land Use Planning - Soil Aspects

PSS 440 Soil Fertility

PSS 442 Soil Taxonomy

PSS 370 Seminar in Plant and Soil Sciences

Plus three courses from the following list:

GES 541 Glacial Geology

INT 500 Seminar in Quaternary Studies

PSS 100 Crop Science

PSS 400 Bioclimatology

PSS 446 Chemical Properties of Soils

PSS 447 Physical Properties of Soils

## Psychology

(18 credits)

The requirements for the minor in Psychology include:

PSY 341 Statistics in Psychology I

PSY 345 Principles of Psychological Research

PSY 470 History and Systems of Psychology

Plus *three* courses selected from the following list:

PSY 350 Cognition  
PSY 351 Psychology of Motivation  
PSY 352 Learning and Motivation  
PSY 354 Human Learning  
PSY 356 Theories of Learning  
PSY 361 Sensation and Perception  
PSY 365 Physiological Psychology

## Zoology

(19 credits)

The requirements for the minor in Zoology include:

ZOL 204 Animal Biology

Plus at least 15 credit hours of zoology courses at the 200 level or above. The most appropriate courses should be selected in consultation with the academic advisor of the *major* program.

NOTE: The minor in Zoology is *NOT* open to students majoring in biology.





## Technical Division

Four associate degree programs are offered at the University of Maine by the College of Applied Sciences and Agriculture (ASA) through its Technical Division. The programs are administered through their respective departments at Orono. Course offerings in the technical programs are distinct and separate in most cases, from those offered for baccalaureate degree students. The technical courses are more applied and place emphasis upon the development of skills for immediate application. Technical instruction is provided by faculty who also teach at the baccalaureate and graduate levels and conduct research in their technical areas. Laboratory instruction and field experience represent an essential part of the technical training program.

The basic objectives of educational programs in the Technical Division are: (1) to provide a practical working knowledge of fundamental principles in specific technical fields which will develop competence for gainful employment; (2) to develop competence in written and oral communications; (3) to contribute to the development of the student's intellectual and personal growth; and (4) to prepare graduates for roles as citizens and effective community leaders.

The two-plus-two program, Resource and Business Management, is designed to complete an associate of science degree after two years of study and a bachelor of science degree after two additional years of study. While the remaining programs are not specifically designed as preparatory for four-year professional curricula, there is a recognized continuum permitting able students whose educational objectives change to transfer to four-year programs upon the successful completion of an associate degree. Students graduating from associate degree programs in Applied

Sciences and Agriculture with an accumulative average of 2.5 or above may transfer to most four-year B. S. degree programs at UM. The student must satisfy the entrance requirements to the desired baccalaureate degree program. Two to three additional years generally are required to complete the baccalaureate degree, depending upon the program selected.

An associate of science degree is awarded to graduates of the programs. Requirements for this degree include the satisfactory completion of a prescribed technical curriculum with a minimum of 60 credit hours earned at an accumulative grade point average of 2.0.

All students admitted to programs in the Technical Division are required to take proficiency exams in math, reading, and writing. Successful completion of these exams allows the student to proceed with the course requirements stated in each program. Students not passing a proficiency exam will be required to take the appropriate developmental course. Developmental courses are non-degree credit and may extend the time required to complete the degree beyond two years.

A basic core curriculum of general education subjects is required in all programs, along with the technical subjects. All students enrolled in the Technical Division are expected to complete the following group of courses representing a basic core requirement:

### Basic Core Curriculum

FAA 100A Seminar in Program	
Major	1
ENG 101A Critical Written	
Expression	3
SPE 101A Oral Communications	3
Humanities or Social Science	
Elective	3

## Associate of Science in Animal Medical Technology

The course of study provides technical training and experience for careers as veterinary aides, laboratory animal technicians in biological and medical research laboratories, small animal hospitals, and commercial testing laboratories for pharmaceutical and feed industries. The

curriculum provides specialized courses in animal care, handling, anatomy, physiology, and in-laboratory clinical work. A final semester of formal course work is required with a laboratory animal facility and a veterinarian with a faculty appointment.

**Curriculum****Basic Core**

FAA 100A Seminar in Animal Medical Technology	1
ENG 101A Critical Written Expression	3
SPE 101A Oral Communications	3
Humanities and Social Sciences Elective	3
<b>TOTAL HOURS</b>	<b>10</b>

**Fundamental Sciences**

ANV 109A Mammalian Anatomy	3
ANV 110A Mammalian Physiology	3
ANV 119A Laboratory Animal Diseases	3
BCH 125A Chemistry for Animal Technology	5
INT 120A Basic and Pathogenic Microbiology	5
<b>TOTAL HOURS</b>	<b>19</b>

**Applied Technology**

ANV 113A Large Animal Care and Handling	3
ANV 114A Laboratory Animal Technology I	3
ANV 116A Laboratory Animal Technology II	3
ANV 123A Clinical Laboratory Methods	3
ANV 124A Laboratory Methods Practicum	3
ANV 128A Radiology	2
<b>TOTAL HOURS</b>	<b>17</b>
ANV 130A Practicum in Animal Medical Technology: Externship	16

**TOTAL HOURS REQUIRED FOR ASSOCIATE  
DEGREE: 62**

## Associate of Science in Landscape and Nursery Management

The Landscape and Nursery Management Program is offered cooperatively by the Department of Plant and Soil Sciences of the University of Maine at Orono and the Southern Maine Vocational Technical Institute of South Portland. Students may enroll and take their freshman year at either institution. The second year of the program is taken at Orono and the student receives an associate of science degree from the University of Maine at Orono.

The curriculum focuses on preparing the student for designing and interpreting landscape plans; planting and cultivating trees, shrubs, and flowers; building and maintaining lawns; constructing landscape features including walks, paths, small pools, and walls; and the production, harvesting, and sale of ornamental plants. The program also provides a background in mathematics, English, and those areas important to those in business dealing with the public. All students in the program are required to earn four credit hours of specialized on-the-job training before graduating from the program.

The landscape and nursery industry, which services many and employs several thousand

persons, has become a multibillion dollar concern in this nation. The current emphasis on environmental improvement indicates the awareness and growing interest in the use of trees, shrubs and flowers for the beautification of municipal properties, urban areas, and the countryside. This and other factors have created a shortage of skilled personnel to design, plant, care for, and distribute the ornamental plant materials used throughout the country.

According to a recent survey of the industry in Maine, many employment opportunities exist for qualified landscape and nursery technicians. The survey also indicated the increasing need for these technically trained individuals through the next ten years. The young person who prepares for a career in this field has almost unlimited opportunities.

**Curriculum****Required Courses**

FAA 100A Seminar in Landscape and Nursery Management	1
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<b>Communications</b>		LNM 126A Turfgrass Management	3
ENG 101A Critical Written Expression	3	LNM 128A Landscape Design	3
SPE 101A Oral Communications	3	LNM 140A Soils and Fertilizers	4
ENG 230A Business, Professional and Technical Writing	3	LNM 196A Field Experience in Landscape and Nursery Management	4
TOTAL HOURS	<u>9</u>	PSS 110 Horticulture*	3
<b>Humanities and Social Sciences</b>		PSS 120 Herbaceous Landscape Plants*	3
Elective	3	PSS 124 Greenhouse Management*	4
TOTAL HOURS	<u>3</u>	PSS 221 Woody Landscape Plants I*	3
<b>Basic Sciences</b>		PSS 222 Woody Landscape Plants II*	3
BOT 101A Introductory Botany	3	TOTAL HOURS	<u>39</u>
ENT 101A Applied Entomology	3	Electives	2
TOTAL HOURS	<u>6</u>	TOTAL HOURS REQUIRED FOR ASSOCIATE DEGREE: 63	
<b>Applied Sciences</b>		*See Plant and Soil Sciences section for course descriptions.	
AEN 107A Landscape Machinery	3		
LNM 123A Nursery/Garden Center Operations	3		

## Associate of Science in Merchandising (Apparel and Home Furnishings)

In recent years, the rapid technological development of new textiles, new finishing processes for existing textiles, and new materials for home furnishings has created a need for personnel in the retail field at the supervisory and managerial levels who have an understanding of these materials. The curriculum provides specialized courses in textiles, apparel, interiors and home furnishings, design elements and principles, and visual and fashion merchandising.

At the completion of the second semester, a placement training program is offered to those students selected by a screening committee. This course is designed to provide on-the-job training. The cooperating merchant compensates the student at the same wage level as other beginning employees in his or her organization. The student who does not elect placement training substitutes pertinent academic courses in the third semester, including a student-managed campus boutique. Upon the completion of the Associate Degree with a grade point average of 2.5, students who desire a broader education and more depth of study in fashion merchandising may transfer into the baccalaureate degree program in merchandis-

ing and consumer resources. A full range of management positions and retail executive training programs is available to holders of the B. S. degree. The four-year curriculum is planned so that a student may complete the second two years with a minimum of 60 additional credit hours.

### Curriculum

#### Basic Core\*

PSY 101A Introduction to Psychology	3
ENG 101A Critical Written Expression	3
SPE 101A Oral Communications	3
FAA 100A Seminar in Merchandising	1
Humanity or Social Science Elective	3
TOTAL HOURS	<u>13</u>

#### Technical Apparel and Home Furnishings

CLD 101A Introduction to Design	3
CLD 103A Textiles: Fiber to Fabric	3

\*A mathematics course or placement exam is also required.

CLD 104A Designing and Furnishing the Home	3	ARE 162A Sales Promotion	3
CLD 105A Retail Management	4	TOTAL HOURS	15
CLD 106A The Apparel Consumer	3	Electives	10
CLD 107A Visual Merchandising	3	TOTAL HOURS REQUIRED FOR ASSOCIATE DEGREE: 60	
CLD 108A Fashion Merchandising	3		
TOTAL HOURS	<u>22</u>	Placement Training: CLD 196A.	
<b>Business and Economics</b>		Students electing placement training for one semester will receive 14 credit hours in place of 7 hours of elective credit, CLD 105A and ARE 160A. Students may also elect CLD 196A on a part-time basis for fewer credits.	
ARE 110A Economics	3		
ARE 160A Marketing	3		
SOC 101A Sociology	3		
ARE 130A Accounting	3		

## Associate of Science in Resource and Business Management

This curriculum places major emphasis on the principles of business management and economics and provides practical training in preparation for entry-level management positions in the food and fiber industries. The training includes courses in economics, marketing, accounting, data processing, statistics, sales promotion, and business management as well as selected technical courses offered by the College of Applied Sciences and Agriculture. Second year students with a 2.5 grade point average may broaden their range of technical electives by selecting four-year courses for which they are qualified.

Students will be prepared for eventual managerial, supervisory, sales, and service positions with business firms and relevant government agencies. Opportunities are available in such fields as food processing, food inspection, retail food stores, floral shops, wholesale nurseries, feeds, farm machinery, golf courses, and campgrounds.

Students will have the opportunity to apply for placement training with a business firm in Maine as an integral part of their academic program. Students selected for this option will spend approximately six months working in a management training program away from campus. For successful completion of this program, students receive up to 16 hours of academic credit. This program takes place during the summer and fall following the first year on campus. Students not electing this option remain on campus in regular academic classes.

Both groups complete their programs in two academic years. A student also may elect a shorter period of field experience on either a full or part time basis. The placement training experience provides a resource that gives greater breadth to the program in areas where formal courses are not available.

A two-plus-two alternative is available to students. The program of study during the first year is identical for both alternatives. Students are required to have a 2.5 grade point average after the first year of study in order to continue in the two-plus-two alternative. Students selecting this alternative complete the second year of the associate degree program in transition to the bachelor's degree program in Agribusiness and Resource Economics. Upon successful completion of specified courses, the student receives an associate degree and qualifies for transfer to the B. S. program in Agribusiness and Resource Economics which may be completed in four additional semesters or a total of four years.

Those students who do not elect the two-plus-two option, but who later desire to continue their education in a baccalaureate program, can still apply for transfer under existing university regulations. Because of the specialized nature of the courses in the curriculum, the program is especially suitable for transfer into the bachelor's degree program in Agribusiness and Resource Economics. It is not intended, nor designed, as a transfer program into the College of Business Administration.

## Curriculum in Resource and Business Management

### First and Second Years\*

#### Associate Degree

FAA 100A Seminar in Resource and Business Management 1

#### Communications

ENG 101A Critical Written Expression 3

SPE 101A Oral Communications 3

ENG 230A Business, Professional and Technical Writing 3

**TOTAL HOURS** 9

#### Social Sciences

ARE 140A Introduction to Organizational Behavior 3

ARE 141A Social and Economic Problems of Rural Life 3

Humanities or Social Science Elective 3

**TOTAL HOURS** 9

#### Business and Economics

ARE 110A Economics 3

ARE 160A Marketing 3

ARE 130A Accounting 3

ARE 132A Agribusiness Accounting 3

ARE 120A Statistics 3

ARE 155A Business Management 3

ARE 122A Data Processing 3

**TOTAL HOURS** 21

LSA Electives 8

Free Electives 12

**TOTAL HOURS REQUIRED FOR ASSOCIATE DEGREE: 60**

BIO 100 Basic Biology 4

ARE 458 Principles of Management in Agribusiness 3

MAT 113 Mathematics for Business and Economics 3

MAT 114 Mathematics for Business and Economics II 3

ARE 486 Government Policies Affecting Rural America 3

FAA Electives (four-year transferable) 3

Humanities and Social Science Elective 3

Third and fourth year subjects leading to a B. S. degree for students completing the A. S. degree two-plus-two option:

### Bachelor's Degree

#### Basic Sciences

Electives 7

**TOTAL HOURS** 7

#### Humanities and Social Sciences

Electives 3

**TOTAL HOURS** 3

#### FAA Electives

INT 219 Introduction to Ecology 3

Electives 3

**TOTAL HOURS** 6

#### Economics

ECO 421 Intermediate Macroeconomics 3

OR

ECO 453 Money and Banking (3)

ECO 420 Intermediate

Microeconomics 3

**TOTAL HOURS** 6

#### Agricultural and Resource Economics

ARE 371 Introduction to Natural Resource Economics and Policy 3

ARE 453 Farm Management 3

ARE 454 Introduction to

Production Economics 3

ARE 465 Food and Fiber Marketing 3

ARE 459 Agricultural Business

Finance 3

ARE 468 Price Analysis and

Forecasting 3

ARE 471 Resource Economics 3

OR

ARE 473 Land Economics (3)

ARE 489 Seminar 2

ARE Elective 3

**TOTAL HOURS** 26

## Curriculum in Two-plus-Two Option\*

Students electing to continue the two-plus-two option the second year will take the following courses:

ARE 120A Statistics 3

ENG 105A Business, Professional and Technical Writing 3

ECO 121 Principles of Macroeconomics 3

\*Student must have a grade point average of 2.5 after the first year of study in order to continue in the two-plus-two option. The associate of science degree is awarded after the completion of 60 credit hours.

<b>Mathematics and Statistics</b>		Free Electives (any course in the University for which the student is qualified)	7
MAT 215 Introduction to Statistics for Business and Economics	3	SUBTOTAL (3rd and 4th years)	58
OR			
ECO 485 Introduction to Economic Statistics and Econometrics	(3)	TOTAL HOURS REQUIRED FOR BACHELOR OF SCIENCE DEGREE: 120	
<b>TOTAL HOURS</b>	<b>3</b>		

## Courses in Animal Agriculture and Animal Medical Technology

### ANV 109A Mammalian Anatomy and Physiology I

A study (with dissection of the cat) of mammalian anatomy. Lec 2, Lab 1. Cr 3.

### ANV 110A Mammalian Anatomy & Physiology II

A basic course discussing the function of different organ systems and their interrelationship in mammals. Emphasis is placed on the neuromuscular, cardiovascular, renal, respiratory, digestive, endocrine and reproductive system. Prerequisite: ANV109A. Lec 3. Cr 3.

### ANV 113A Large Animal Care and Handling

A course designed to familiarize the student with handling, restraining, sampling and medicine administration of common large animals encountered in veterinary practice. Lab fee \$10. Lec 2, Lab 2. Cr 3.

### ANV 114A Laboratory Animal Technology I

The principles of humane with animal care in clinics, hospitals and research laboratories. Animal house design, equipment and management problems will be discussed. Characteristics of individual animal species will be studied. Lab fee \$15. Lec 2, Lab 2. Cr 3.

### ANV 116A Laboratory Animal Technology II

This course will be divided between a consideration of the principles of animal genetics and the principle of animal nutrition. Topics to be included under animal genetics are: the DNA molecule; mitosis and meiosis; mono and dihybrid matings; sex determination and sex-linked genes; quantitative inheritance and systems of mating. The animal nutrition section

will include an explanation of the various nutrients and how they relate to animal growth and reproduction; the digestive process; factors effecting the value of feeds; feeding systems for laboratory animals. Lec 2, Lab 1. Cr 3.

### ANV 119A Laboratory Animal Diseases

Principles of disease prevention and control as they apply to common laboratory rodents, carnivores and primates. Lec 3. Cr 3.

### ANV 121A Problems in Animal and Poultry Production I

Cr Ar.

### ANV 122A Problems in Animal and Poultry Production II

Cr Ar.

### ANV 123A Clinical Laboratory Methods

A descriptive and familiarization course of current laboratory procedures used in veterinary medicine. Technical procedures in urinalysis, hematology, clinical chemistry, instrumentation and parasitology will be covered. Lab fee \$10. Lec 2, Lab 2. Cr 3.

### ANV 124A Laboratory Methods Practicum

The practical application of veterinary techniques on live animals, including surgical preparation, instrument preparation and sterilization, anesthesia, and the demonstration of commonly used surgical methods. Lab fee \$10. Lec 1, Lab 4. Cr 3.

### ANV 128A Radiology

Radiology and laboratory periods prepare the student for positioning of animals, the working of the X-ray machine, proper precautions, and development of quality films. Cr 2.

### ANV 130A Practicum in Animal Medical Technology

Fourteen weeks of practical experience from both assigned laboratories and veterinary facilities in the field with UMO appointments. The student will be taught the practical aspects of anesthesiology, radiology, nursing, ethics,

public relations, pharmacology and assisting in surgery, and laboratory techniques and procedures. Visits from the director of the AMT program will be made every 3 weeks to check on progress of the training. (Pass/Fail Grade Only). **Cr 16.**

#### **ANV 196A Field Experience in Animal and Veterinary Science**

Provides on-the-job training in the field related to program of study. Work is to be under supervision of employer and appropriate department or school in the College of Life Sciences and Agriculture. Prerequisite: C average. (Pass/Fail Grade Only). **Cr Ar.**

#### **Interdisciplinary Course**

##### **INT 120A (ANV, MCB) Basic and Pathogenic Microbiology**

The basic principles of Microbiology involving the cultivation, separation, identification and control of microorganisms. The identification of pathogens will be stressed. Lec 3, Lab 4. **Cr 5.**

#### **Courses in Bio-resource Engineering**

##### **AEN 107A Landscape Machinery**

Principles of construction, operation and adjustment of tractors and machines used in landscape management. Economics related to cost and management of mechanized operations. Laboratory includes test and adjustment of small engines and related equipment. Lec 2, Lab 2. (Pst majors only) **Cr 3.**

##### **AEN 116A Power and Machinery Systems**

Construction principles and maintenance of spark ignition and diesel engines. Power transmission and hydraulic systems for mobile equipment. Economics of machinery operation. Lec 2, Lab 2. **Cr 3.**

#### **Courses in Landscape Nursery Management**

##### **LNM 123A Nursery and Garden Center Operations**

The principles and practices involved with plant propagation, production marketing and sales as seen from the landscape horticulture industry perspective. Emphasis will be placed on production systems and nursery and garden center business management. **Cr 3.**

##### **LNM 126A Turfgrass Management**

The characteristics, soil and environmental adaptation, propagation, specific uses and

management requirements of grasses for turf. Identification, fertilizing, clipping, watering and controlling weeds, insects, and diseases of turf grasses. Renovation and construction of turf areas by seeding and sodding. Rec 2, Lab 2. **Cr 3.**

##### **LNM 127A Landscape Construction**

Techniques and use of construction materials in landscaping. Emphasis on the basic knowledge and skills needed for planning and constructing terraces, steps, walls, fences, site furniture, decks, irrigation design and paving materials. Rec 2, Lab 2. **Cr 3.**

##### **LNM 128A Landscape Design**

The principles of landscape design as applied to selected problems. The course is designed to prepare students for situations similar to those in the industry. Rec 2, Lab 2. **Cr 3.**

##### **LNM 140A Soils and Fertilizers**

Soil properties and their relation to crop production with special emphasis on management and use of commercial fertilizers. Rec 3, Lab 2. **Cr 4.**

##### **LNM 150A Fundamentals of Forest Soils**

Study of the basic properties and processes of forest soils with emphasis on factors influencing tree growth in commercial forests. Rec 2, Lab 2. **Cr 3.**

##### **LNM 161A Potato Production**

Production of potatoes for seed, tablestock and processing. Fertilization, variety selection, disease and insect pests, and plant development are among the topics covered. Rec 3. **Cr 3.**

##### **LNM 163A Forage Management**

Production of hay, silage, and pasture crops. Selection of seeding mixtures, establishment of forage seedings; use of lime and fertilizers to maintain forage productivity. Pasture management; harvesting and preservation of hay and silage. Rec 2, Lab 2. **Cr 3.**

##### **LNM 196A Field Experience in Landscape and Nursery Management**

Provides on-the-job training in the field related to program of study. Work is to be under supervision of employer and the department of Plant and Soil Sciences in the College of Life Sciences and Agriculture. Prerequisite: C average. (Pass/Fail Grade Only). **Cr Ar.**

#### **Courses in Merchandising**

##### **CLD 101A Introduction to Design**

Selection and organization of visual elements

and principles of design to create harmony in compositions and to obtain function, economy, beauty, and individuality in daily living. Rec 2, Lab 2. Cr 3.

#### **CLD 103A Textiles: Fiber to Fabric**

Learning to recognize quality features of fabrics and to understand labels for fiber content, functional finish, and care. Fiber properties and performance data. Fair claim policy. Names and consumer uses of fabrics. Cr 3.

#### **CLD 104A Designing and Furnishing the Home**

Planning functional and aesthetic qualities of the home for individual and family situations. Focus on selection, organization, and evaluation of furnishings and materials for residential interiors. Layout in floor plans and wall elevations. Rec 2, Lab 4. Cr 3.

#### **CLD 105A Retail Management**

A study of the operations of a retail store culminating in the actual experience of managing a store. Cr 4.

#### **CLD 106A The Apparel Consumer**

Clothing and accessories for physical, social, and economic needs of various age groups. Size, cut, fit, construction, and price level. Hanger appeal and combining value in the wardrobe. Studies of consumers' satisfaction. Cr 3.

#### **CLD 107A Visual Merchandising**

Creation of visually stimulating designs to focus and hold people's interest on a product, service, or idea. Problems in visual communication such as trademarks, advertisements, posters, package designs, and displays. Lettering, illustration, layout. Rec 1, Lab 4. Cr 3.

#### **CLD 108A Fashion Merchandising**

Sources of fashion with charting of trends. Promotion of fashion in home furnishings and clothing. Comparative shopping and evaluation of perishability. Cr 3.

#### **CLD 196A Field Experience in Merchandising**

Provides on-the-job training in the field related to program of study. Work is to be under supervision of employer and appropriate department or school in the College of Food, Agriculture and Applied Sciences. Prerequisite: C average. (Pass/Fail Grade Only). Cr Ar.

## **Courses in Resource and Business Management**

#### **ARE 110A Economics**

Economic principles applied to solving problems of the consumer and firms. The interdependence of the natural resource sector with the national economic forces influencing prices, competition, level of employment and economic growth. Rec 3. Cr 3.

#### **ARE 120A Statistics**

The nature and use of statistics, including methods of collecting, organizing, interpreting, and reporting data for business management decisions. Measurement of central tendency, trends and relationships, sampling variability, and quality control. Rec 2, Lab 2. Cr 3.

#### **ARE 122A Data Processing**

Introduction to the principles and techniques of microcomputer processing. Practical applications are included. Rec 3. Cr 3.

#### **ARE 130A Accounting**

The principles and procedures used in the preparation of balance sheets and income statements. Deals with the systematic recording, classifying, and analyzing of business transactions. Preparation and presentation of accounting information. Rec 2, Lab 2. Cr 3.

#### **ARE 132A Agribusiness Accounting**

This course is a continuation of introductory accounting. Includes valuation and analysis of stockholders' equity and liabilities, preparation of statement of changes in financial position and consolidated financial statements, accounting for inflation, and financial statement analysis. Cr 3.

#### **ARE 140A Introduction to Organizational Behavior**

This course describes and explains the systems and subsystems which comprise an organization's structure. Cases are used to develop skills needed by a successful manager operating in either a small scale or large scale economic institution. Cr 3.

#### **ARE 141A Social and Economic Problems of Rural Life**

The social and economic problems of rural life. The social systems of community, family, religion, education, and economics. Leadership, power structure and social stratification. Rec 3. Cr 3.

#### **ARE 154A Farm Management**

Managing the farm business for optimum re-



turns; economic guides to decision making; management tools and their application; organizing resources for production; adjustments to change. Rec 3. **Cr 3.**

#### **ARE 155A Business Management**

Forms of business organization, economic framework, the managerial functions, managerial decision making and concepts of managerial economics. Application of the principles of management in the agribusiness sector. Rec 3. **Cr 3.**

#### **ARE 160A Marketing**

Marketing and the basic activities involved in this function of modern business. Covers theoretical principles, consumer and product characteristics, trade practices, market channels, and the improvement of markets and marketing. Food and agricultural marketing applications and case analysis. Rec 3. **Cr 3.**

#### **ARE 162A Sales Promotion**

The use of advertising, sales and merchandising techniques. Training of sales and service personnel. Case studies are used to develop an interdisciplinary approach to promotion. Rec 3. **Cr 3.**

#### **ARE 196A Field Experience in Agriculture and Resource Economics**

Provides on-the-job training in the field related to program of study. Work is to be under supervision of employer and appropriate department or school in the College of Life Sciences and Agriculture. Prerequisite: C average. (Pass/Fail Grade Only). **Cr Ar.**

#### **ARE 197A Independent Studies**

Analysis of and readings on current manage-

ment problems in production, processing, distribution, and marketing. Prerequisite: permission of instructor. **Cr Ar.**

### Technical Division Courses

#### **BOT 101A Introductory Botany**

The structure and life processes of seed plants, their propagation, breeding, classification, and relation to their environment. Rec 2, Lab 3. **Cr 3.**

#### **BCH 125A Chemistry for Animal Technology**

An introduction to the principles of inorganic, organic, and biochemistry. Lec 4, Lab 2. **Cr 5.**

#### **BCH 160A Introduction to Biochemistry**

Basic principles of general, organic, and biochemistry are covered. Organic structures and functional groups are introduced. Topics in biochemistry include carbohydrates, lipids, proteins, nucleic acids, and enzyme action. High school chemistry is recommended. Lec 3, Lab 3. **Cr 4.**

#### **ENT 101A Applied Entomology**

Consideration of insect benefits and detriments to man. General structure, classification, habits, and life histories of representative pest species. Study of all phases of control with emphasis on development, use and implication of pesticides to production and marketing. Lec 2, Lab 2. **Cr 3.**

#### **FAA 100A Seminar in (Program Major)**

A review of the major area of study and a survey of career opportunities. Rec 1. **Cr 0-1.**



# College of Business Administration

W. Stanley Devino, *Dean*

Merrill D. Bartlett, *Associate Dean*

Professors Alpander, Devino, Forsgren, Gilmore, Givens, McClure, Naor; Associate Professors Bartlett, Ford, Gibson, Strong; Assistant Professors Carter, Eastergard, Garsombke, Gehrt, Geiger, McConnell, J. Pinto, M. Pinto, Rauch, Spurrell, Sanford, Yale; Lecturer Ingalls.

Both the undergraduate program and the MBA program in the College are accredited by the American Assembly of Collegiate Schools of Business. The AACSB is recognized by the Council on Postsecondary Accreditation and by the Office of Postsecondary Education, U. S. Department of Education, as the sole accrediting agency for baccalaureate and master's degree programs in business administration.

The College of Business Administration offers a four-year program in the major area of business administration. Upon successful completion of the prescribed curriculum the student is awarded the Bachelor of Science degree.

The College also provides a graduate program leading to the degree of Master of Business Administration. The graduate offerings of the College of Business Administration are described in the Graduate School Catalog.

## Undergraduate Program

The primary objective of the undergraduate program in business administration is to develop the student's abilities to assume the responsibilities of business management. The program is aimed at providing the broad training necessary for successful business management in a rapidly changing economy. No attempt is made to provide detailed specialized training in particular business tasks. The program aims, rather, at developing skills and attitudes that will enable the student to cope successfully with the changing problems of business management in the years ahead. Implementation of this program takes place in three general phases. First, students acquire broad training in the liberal arts and sciences for the necessary foundation upon which their future education will build; second, students

pursue a program of study designed to provide them with an understanding of the major functional areas common to most business operations and with a knowledge of certain fields which are particularly relevant to the study of business management (this is referred to as the "core" program and includes basic courses in accounting, management information systems, economics, finance, the legal environment of business, marketing, and general management); third, students undertake to acquire a deeper knowledge of the field of concentration which they have selected. This is done largely during the senior year and is accomplished by taking 15 credit hours of work beyond the introductory course in the chosen field. The five fields of concentration in which advanced work may be done are accounting, finance, management information systems, marketing, and management.

## General Information

### Admission

Students are usually admitted to the College of Business Administration as first-year students in the University. For the specific requirements for admission see the "Admission" section. All deficiencies in entrance requirements must be removed before registering for the sophomore year. Students who transfer from other colleges with advanced standing must satisfy all basic entrance requirements within one year.

### Transfer Credit

Under the accreditation standards of the American Assembly of Collegiate Schools of Business, no transfer credit is granted for business courses taken during the freshman and sophomore years, with the exception of six semester hours for Principles of Accounting and three semester hours for the Legal Environment of Business. However, a transfer student from an institution designated as regionally accredited who has taken a business course at the lower

division level which is offered at the upper division level at the University of Maine may request validation of said course. The method of validation consists of an examination procedure to demonstrate acceptable proficiency consonant with the overall educational experience required of all students in the College of Business Administration. Also, no transfer credit is granted for any course completed at another accredited institution in which grades below "C" have been received. Responsibility for evaluating course work for which transfer credit is requested rests with the Director of Admissions and the Dean of the College of Business Administration.

Students from other campuses of the University of Maine who wish to transfer to the College of Business Administration must present an academic record that meets at least the minimum standards of quality established by the University. Also, they are required to complete at least one full year of academic work as students in the College of Business Administration.

#### **Change of College Policy at UM (Effective February 9, 1979)**

1. For students in baccalaureate programs transferring from other colleges at UM, the minimum grade point requirement is 2.5.
2. For students in two-year programs, the minimum grade point requirement is 2.8.
3. Students in University College programs should refer to the UC transfer policy. (Effective February 1, 1989)

#### **Course Enrollment Policy In Business Administration Courses (Effective February 9, 1979)**

1. First preference is given to College of Business Administration students.
2. Second preference is given to students where the course is required in another program.
3. All others are given third preference.

In the event students cannot be accommodated in any BUA course(s), they are invited to sign up on a waiting list for each course. (The course may be offered the following semester or the following year.) The waiting list will be on a "first-come, first-served" basis. However, the list will follow the priority listed above.

#### **Senior Year in Residence**

To receive a B. S. in Business Administration degree at the University of Maine, a student

must fulfill the senior year residency requirement. This means the last 30 degree hours in the academic program must be completed at the University of Maine.

#### **Graduation Requirements**

Completion of the required work of the College of Business Administration leads to the degree of Bachelor of Science. All students are required to complete 120 degree hours.

Students must have a 2.0 accumulative average to graduate. The accumulative average is figured as follows: Total hours taken divided into total quality points received.

All course work taken in business and economics must be completed with a 2.0 ("C") accumulative average for a student to be eligible for a degree.

The required course work for the B. S. in Business Administration is given below:

#### **B. S. in Business Administration Program**

##### **A. General Foundation Subjects (48 credits)**

##### **1. Humanities and Fine Arts (21 credits)**

ENG 101 College Composition

ENG 317 Technical Writing

SPC 103 Fundamentals of Public Communication

At least three of the remaining 12 credit hours must have an ENG designation. The remainder may be selected in such fields as: art, the classics, English composition, foreign languages, journalism, literature, music, philosophy, speech, and theatre.

##### **2. Behavioral and Social Sciences (15 credits)**

PSY 100 General Psychology

No economics course may be taken to fulfill this requirement. The remaining credits may be taken in such fields as: anthropology, Canadian studies, history, modern society, political science, psychology, and sociology.

##### **3. Mathematics and Computer Science (12 credits)**

MAT 113/114 Mathematics for Business and Economics\*

MAT 215 Introduction to Statistics for Business and Economics\*\*

\*MAT 126 may be substituted for 114.

\*\*MAT 434 may be substituted for MAT 215.

COS 211 Principles of Data Processing  
OR  
COS 210 Introduction to Computing  
Using COBOL\*\*\*

B. Core Requirements in Business (33 credits)

BUA 201 Principles of Accounting I  
BUA 202 Principles of Accounting II  
BUA 220 The Legal Environment of Business  
BUA 325 Principles of Management and Organization  
BUA 335 Principles of Management Information Systems  
BUA 337 Production and Operations Management  
BUA 349 Administrative Policy and Business Environment (Seniors only)  
BUA 350 Business Finance  
BUA 370 Marketing  
ECO 120 Principles of Microeconomics  
ECO 121 Principles of Macroeconomics

C. Field of Concentration (15 credits) The field of concentration is composed of 15 credit hours to be required by each functional area subject to approval of the faculty. All courses must carry BUA or ECO designators.

1. Accounting (15 credits)

Required:

BUA 301 Intermediate Accounting I  
BUA 302 Intermediate Accounting II  
BUA 305 Cost Accounting I  
BUA 307 Advanced Accounting I  
BUA 310 Auditing

Students concentrating in accounting are strongly encouraged to take the following courses as free electives:

BUA 306 Advanced Managerial Accounting  
BUA 308 Advanced Accounting II  
BUA 312 Federal Tax Reporting  
BUA 314 Accounting Control Systems

2. Finance (15 credits)

Required:

BUA 351 Corporate Treasury Dynamics  
BUA 352 Financial Institutions  
BUA 353 Investment Strategy  
BUA 366 Decision Support Systems for Management

Any one of the following:

BUA 301 Intermediate Accounting I  
BUA 305 Cost Accounting I  
BUA 354 Speculative Markets  
ECO 471 Public Finance and Fiscal

Policy

ECO 472 State and Local Government Finance

ECO 420 Intermediate Microeconomics

ECO 475 Industrial Organization

3. Management (15 credits)

Required:

BUA 326 Dynamics of Organization and Behavior

BUA 327 Seminar in Contemporary Management Problems

BUA 330 Personnel Management and Industrial Relations

And any two of the following:

BUA 328 Canadian/U. S. Business: A Comparison

BUA 331 Labor-Management Relations

BUA 340 Problems of Small Business

BUA 345 International Management

BUA 364 Database Management Systems

BUA 366 Decision Support Systems for Management

BUA 384 Business Logistics

4. Management Information Systems (15 credits)

Required:

BUA 361 Data and File Structures for Business Applications

BUA 364 Database Management Systems

BUA 365 Business Systems Development

And any two of the following:

BUA 363 Distributed Information Systems for Management

BUA 366 Decision Support Systems

BUA 378 Marketing Research

BUA 305 Cost Accounting

BUA 330 Personnel Management and Industrial Relations

BUA 351 Corporate Treasury Dynamics

5. Marketing (15 credits)

Required:

BUA 378 Marketing Research

BUA 380 Managerial Marketing

Capstone Course\*

BUA 382 Consumer Behavior

And any two of the following:

BUA 366 Decision Support Systems for Management

BUA 372 Advertising

\*\*\*COS 210 is required for students concentrating in management information systems

\*Prerequisites: BUA 378, BUA 382, Senior Standing

BUA 374 Sales Management  
BUA 376 International Marketing

BUA 384 Business Logistics  
D. Free Electives (24 credits)

## Specimen Curriculum

### Freshman Year

Fall Semester	Spring Semester
ECO 120 Principles of Microeconomics	ECO 121 Principles of Macroeconomics
ENG 101 College Composition	MAT 114 Math for Business & Economics
MAT 113 Math for Business & Economics	SPC 103 Fundamentals of Public Communication
PSY 100 General Psychology	English Elective
Free Elective	Social Science Elective

### Sophomore Year

Fall Semester	Spring Semester
BUA 201 Principles of Accounting I	BUA 202 Principles of Accounting II
MAT 215 Introduction to Statistics for Business & Economics	BUA 220 The Legal Environment of Business
Humanities Elective	COS 210 Introduction to Computing Using COBOL (required for MIS concentration)
Social Science Elective	OR
Free Elective	COS 211 Principles of Data Processing
	Humanities Elective
	Social Science Elective

### Junior Year

It is recommended that the following courses be completed during the junior year: BUA 325, BUA 335, BUA 337, BUA 350, BUA 370, ENG 317, one humanities elective, one social science elective, and two free electives.

It is possible for the student to take a field of concentration course during the spring semester if he or she has the necessary prerequisite(s). Accounting students are required to take BUA 301 and BUA 305 during the fall semester of their junior year.

### Senior Year

It is recommended that the following courses be completed during the senior year: Five field of concentration courses, BUA 349, one humanities elective, and three free electives.

### 300-Level Course Policy

College of Business Administration students, as well as all other students, must have junior standing (53 or more degree hours) in order to take all BUA undergraduate courses except BUA 201, BUA 202, and BUA 220. Students are strongly advised to take BUA 201, BUA 202, and BUA 220 during their sophomore year (these courses are not open to freshmen).

### Honors Program

Robert Strong, Honors Secretary

Freshmen and sophomores of marked academic ability are encouraged to consider participation in the University Honors Program. Qualified students may be admitted to the Honors Program at any time up to the beginning of the junior year. HON 101, HON 102, HON 201, HON 202, HON 301, and HON 302 are taken in common with students from other colleges within the University. These courses all satisfy College of Business Administration requirements in the area of humanities/fine arts or free electives. HON 397, HON 498, and HON 499 are taken during the junior and senior years, and involve individual research and the writing of the senior honors thesis. Additional information about the Honors Program will be found in the "Honors" section of this catalog.

### Courses in Business Administration

#### BUA 201 Principles of Accounting I

An introductory course in accounting covering the fundamental accounting equation, the basic principles of accounting measurements, the accounting cycle, the construction of financial

statements, and asset analysis and valuation. Prerequisite: sophomore standing. Cr 3.

### **BUA 202 Principles of Accounting II**

A continuation of introductory accounting, covering analysis and valuation of liabilities and stockholder's equity, basic principles of consolidated statements and the statement of changes in financial position, cost accumulation methods and management decision-making. Prerequisite: BUA 201. (Sophomore Standing). Cr 3.

### **BUA 220 The Legal Environment of Business**

An examination of fundamental legal concepts and their application to the business community. Among the topics discussed are the evolution of law and its underlying conceptual framework from which legal rules and principles of business develop. Selected legal cases will be critically analyzed and discussed. Prerequisite: BUA 201 or permission. (Sophomore Standing). Cr 3.

### **BUA 301 Intermediate Accounting I**

Principles regarding the valuation and recording of working capital items and noncurrent items; capital stock and surplus; statement analysis. Prerequisites: BUA 201, 202. Cr 3.

### **BUA 302 Intermediate Accounting II**

A study of the accounting and valuation problems of assets and a consideration of current issues and controversies in financial accounting. Prerequisite: BUA 301. Cr 3.

### **BUA 305 Cost Accounting**

The principles and methods of job order costs, including inventory control and pricing, labor and analysis and allocation of factory overhead. Principles and practices of process cost accounting. Prerequisites: BUA 201, 202. Cr 3.

### **BUA 306 Advanced Managerial Accounting**

A comprehensive study of joint and by-product costs, estimated and standard costs, distribution and differential costs. Budgeting. Analysis of cost structure and management use of standards. Prerequisite: BUA 305. Cr 3.

### **BUA 307 Advanced Accounting I**

Principles, theory, and procedures of parent and subsidiary accounting. A comprehensive study of consolidated statements, affiliation structures, and consolidations and mergers. Also includes home office and branch accounting. Prerequisite: BUA 301. Cr 3.

### **BUA 308 Advanced Accounting II**

Application of accounting principles to accounting problems arising in connection with: partnerships, joint ventures, insurance, consignments, installment sales, statement of affairs, receiverships, estates and trusts, statement of realization and liquidation, foreign exchange, and governmental and institutional accounting. Prerequisite: BUA 301. Cr 3.

### **BUA 310 Auditing**

The systematic verification of financial statement including a study of the responsibilities, liabilities and ethics of the independent public accountant. Prerequisite: BUA 301. Cr 3.

### **BUA 312 Federal Tax Reporting**

Federal tax laws as they affect individuals, partnerships, corporations, and estates. An opportunity is given the student to become familiar with tax forms. Prerequisites: BUA 201, 202, 305. Cr 3.

### **BUA 313 International Accounting and Taxation**

Financial, managerial and tax accounting and auditing in multinational enterprises. Comparison of practices and procedures in different countries. Prerequisite: BUA 301. Cr 3.

### **BUA 314 Accounting Control Systems**

An upper level management accounting course emphasizing accounting as a system for information and control. Particular emphasis on the organizational and behavioral implications of accounting. Prerequisites: BUA 305, 325. Cr 3.

### **BUA 319 The Environment of Accounting**

This course assists the student in the transition from school to employment in the accounting profession. Prerequisite: Accounting major with senior standing. Cr 1.

### **BUA 325 Principles of Management and Organization**

Analysis of the internal organizational structure and the process of management in business enterprises both domestic and international. Attention is focused upon concepts, methods, and techniques of planning, organizing, directing, and controlling the functions of the modern manager. The impact of these processes upon effective interpersonal relations will be highlighted. Prerequisites: ECO 120 and 121. (Junior Standing). Cr 3.

### **BUA 326 Dynamics of Organization and Behavior**

An analysis of business organization and the problems of administrators in an interpersonal

setting. Primary emphasis is on the findings of behavioral sciences which are particularly relevant to the management of economic enterprises. Also an examination of interdisciplinary approaches to human relations and adjustment problems in modern organizations. Motivation, leadership, and organization theory as related to work and productivity, and associated topics are also covered. Prerequisite: BUA 325.

Cr 3.

#### **BUA 327 Seminar in Contemporary Management Problems**

Seminar in developments in the behavioral and management sciences, the development of management thought, and critical issues in organizational theory, with special reference to industrial application. In addition, students will conduct library research, or field work of considerable depth, in select managerial topics. Prerequisite: BUA 326.

Cr 3.

#### **BUA 328 Canadian/U. S. Business: A Comparison**

A comparative review of the recent history of Canadian-U. S. business relations with primary emphasis on cross-border trade issues and, specifically, the impact of that bilateral trade on Maine's business environment. Attention is focused on the topics of energy, lumber, paper, agricultural products, industrial production, freight/transportation, and foreign investments. Prerequisite: Junior Standing.

Cr 3.

#### **BUA 330 Personnel Management and Industrial Relations**

The personnel management systems of private and public organizations are surveyed from the interdisciplinary perspective of modern industrial relations. The use of an integrated behavioral, quantitative and systems approach permits an applied synthesis of the social sciences which analyze the employment relationship. Prerequisites: Permission or the equivalent of ECO 120, 121, and PSY 100. (Junior Standing).

Cr 3.

#### **BUA 331 Labor-Management Relations**

The labor-management systems of the private and public sectors are surveyed from the interdisciplinary perspective of modern industrial relations. The nature and characteristics of labor-management relations are considered from such perspectives as the structural, historical, international, legal, psychological, and economic. Prerequisite: Junior Standing.

Cr 3.

#### **BUA 335 Principles of Management Information Systems**

The role of information systems and data processing in business planning and control. Technology of information systems, economics of information, planning, decision making and control in business organizations. Prerequisites: MAT 215 and COS 211. (Junior Standing).

Cr 3.

#### **BUA 337 Production and Operations Management**

The place of production planning and control in an industrial organization and its relation to the actual production procedure. Problems in design, marketing, forecasting, capacity evaluation and quality control are interwoven with those of production and inventory management. Prerequisite: BUA 325. (Junior Standing).

Cr 3.

#### **BUA 340 Problems of Small Business**

Aspects of management uniquely important to small firms. Develops understanding of the economic and social environment in which the small concern functions. Student practice in decision-making on types of problems that small businesses face. For students who wish to explore opportunities for operating their own small businesses, and to those who expect to have small businesses as customers or suppliers. Problems relevant to small business operations in Maine stressed. Prerequisites: BUA 325, 350, 370 and senior standing with permission.

Cr 3.

#### **BUA 341 Dynamics of Small Enterprises**

Course assumes a broad management background at the undergraduate level and understanding of basic problems of small business and consulting techniques developed in BUA 340. That background is focused on the special problems of entrepreneurship, venture capital, and growth management provided through the Small Business Administration's Small Business Institute program. Students will work in or manage teams in problem solving. Prerequisite: BUA 340.

Cr 3.

#### **BUA 345 International Management**

Management problems of organizations whose interests extend across international boundaries. Significance of cultural traditions and social structures for the conduct of business enterprise. International similarities and differences in managerial functions, structure, and



processes. Prerequisite: BUA 325 or permission. (Junior Standing). **Cr 3.**

#### **BUA 349 Administrative Policy and Business Environment**

Administrative decision making and policy setting, with consideration of social and political forces and ethical values. Seniors only. Prerequisites: BUA 325, 335, 350, 337, and 370.

**Cr 3.**

#### **BUA 350 Business Finance**

This course deals with the promotion, organization, and financing of the single proprietorship, partnership, and corporation. It also utilizes advanced cases and problems related to the above topics. Prerequisites: ECO 120, 121, and BUA 201. (Junior Standing).

**Cr 3.**

#### **BUA 351 Corporate Treasury Dynamics**

The counterflows of cash between the corporate unit and the money market due to seasonal, cyclical, and secular demands. Numerous approaches to debt limit determination. Total problem of making optimal financing decisions in specific corporate and bank management settings. Prerequisite: BUA 350.

**Cr 3.**

#### **BUA 352 Financial Institutions**

The operations and economic roles of financial institutions: commercial banks, investment houses, and investment markets; savings and insurance institutions; and governmental agencies. An institutional introduction to the fields of private and public finance. Prerequisites: ECO 120, 121, BUA 350 or permission. (Junior standing).

**Cr 3.**

#### **BUA 353 Investment Strategy**

Analysis and selection of stocks and bonds as part of the investor's approach to financial security. The relationships between the securities markets, the total money market and the general economy are examined. Prerequisites: ECO 120, 121, BUA 350 or permission. (Junior Standing).

**Cr 3.**

#### **BUA 354 Speculative Markets**

This course examines the practices and principal participants of major commodity and option markets and the financial opportunities presented by these institutions. Special emphasis is placed on the ways in which a hedger may transfer unwanted risk to a speculator who is willing to bear it. Prerequisite: BUA 350.

**Cr 3.**

#### **BUA 361 Data and File Structures for Business Applications**

This course covers program, data, and file structures through advanced applications development and maintenance projects. The primary purposes of the course are: (1) to provide an in-depth understanding of a business-oriented programming language and (2) to introduce theories of efficient structuring of large data files. Principles of software engineering are integrated throughout the course. Prerequisite: COS 210.

**Cr 3.**

#### **BUA 363 Distributed Information Systems for Management**

This course introduces the design and management of information systems in distributed environments. Topics covered include telecommunications, networks, advanced office systems, and strategic considerations in distributing databases, processing, and support. Prerequisite: BUA 335.

**Cr 3.**

#### **BUA 364 Database Management Systems**

Introduction to technical, managerial, and ethical issues associated with computer-based data management. The course covers issues in business database design and development, effective use of database management systems to support management decision making, database management, and database management systems acquisition. Prerequisite: BUA 335 or equivalent and permission.

**Cr 3.**

#### **BUA 365 Business Systems Development**

This course is designed to integrate the areas of computer technology, systems analysis, systems design, and organizational behavior to aid the student in developing management information and decision support systems. The course explores state-of-the-art structured systems analysis and design methodologies and presents a rigorous approach to information systems development. Prerequisite: BUA 335.

**Cr 3.**

#### **BUA 366 Decision Support Systems for Management**

This course covers the managerial use of computer-based modelling to aid decision making. Special emphasis is placed on modelling complex systems under conditions of uncertainty. Principles of decision making, business modelling methods, decision analysis, decision support systems, and expert systems are covered. Prerequisite: BUA 335.

**Cr 3.**

**BUA 370 Marketing**

Problems of distribution for representative industrial and consumer goods, including merchandising policies, selection of distribution channels, price policies, and advertising and sales promotion methods. Prerequisites: BUA 201, ECO 120 and 121 (Junior Standing). Cr 3.

**BUA 372 Advertising**

The place of advertising in the marketing program. Business cases are analyzed to determine those situations in which advertising may be profitably employed to stimulate primary and selective demand for industrial and consumer goods and services. Prerequisite: BUA 370.

Cr 3.

**BUA 374 Sales Management**

An analysis of the problems facing marketing management in formulating sales policy and in managing the sales organization. Prerequisite: BUA 370.

Cr 3.

**BUA 376 International Marketing**

Focuses on marketing principles and strategies that will assist in the successful conduct of international business operations. Differing business environments will be examined in order to sensitize students to needed changes in marketing strategies. Prerequisite: BUA 370.

Cr 3.

**BUA 378 Marketing Research**

A consideration of marketing research as a tool in solving problems of production and distribution. Emphasis is upon problem formulation, exploratory research, research design, basic observational and sampling requirements, data analysis, interpretation, and sampling. Prerequisites: BUA 370 and MAT 215.

Cr 3.

**BUA 380 Managerial Marketing**

A managerial approach emphasizing the integration of marketing, as an organization activity, with other activities of the business firm. Recognition of and appreciation of the problems encountered by top marketing executives in modern business. Prerequisites: BUA 378 and BUA 382.

Cr 3.

**BUA 382 Consumer Behavior**

An analysis of consumer purchase decision processes. An exploration of existing consumer behavior models and their role in the formulation and implementation of marketing strategies. The psychological, sociological and cultural dimensions of buyer behavior; the current state-of-the-art in consumer research, in-

cluding the findings from empirical tests of buyer behavior models. Prerequisite: BUA 370.

Cr 3.

**BUA 384 Business Logistics**

An introduction to the elements of the logistical system includes consideration of transportation modes, plant and warehouse location, inventory size determination, etc. Cases and problems are utilized to sharpen analytical techniques. Final attention turns to the total cost approach to logistical system analysis and decision-making. Prerequisites: BUA 325 and BUA 370.

Cr 3.

**BUA 396 Field Experience-Cooperative Education**

From one (1) to six (6) semester hours of degree credit will be granted for field experience in business and managerial fields provided it is relevant to the student's educational development and career goals. Prior approval of the instructor is required and prior approval of the precise number of credits is also necessary. Students will not be granted credit either retroactively or for field experience courses taken at another university or another campus of this university. A detailed written plan concerning the field experience proposal must be presented by the student to the instructor so that a decision can be made on admission to the course. Prerequisite: junior or senior in the College of Business Administration and permission of instructor.

Cr 1-6.

**BUA 400 Introduction to Accounting**

Limited to pre-MBA students, this course is an introduction to the basic principles underlying the preparation of financial statements and the analysis of financial information. Prerequisite: Permission of the Director of the MBA Program.

Cr 3.

**BUA 430 Quantitative Methods for Business**

This applied course in quantitative methods for business provides pre-MBA students with an introduction to the elementary mathematical functions, systems of equations and inequalities, elements of analytical geometry, linear programming for business applications, matrix algebra, selected topics from calculus, and basic statistics for business. Major topics of normal probability distributions, sampling, estimation, hypothesis testing, regression and correlation analysis and Bayes' Theorem as related to business applications are covered in the

statistics segment. Prerequisite: Permission of the Director of the MBA Program. Cr 3.

**BUA 440 Computer-Based Information Systems**

This course provides an intensive and accelerated introduction to computerized informa-

tion systems. It is designed to provide pre-MBA students with a foundation for understanding and analyzing information systems for business planning and control. Prerequisite: Permission of the Director of the MBA Program.

Cr 3.





# College of Education

Robert A. Cobb, *Dean*

The College of Education offers four-year programs designed to prepare elementary, junior and senior high school teachers, teachers of physical education and teachers of art. The College also provides instruction, on a service basis, in the professional subjects essential for the certification of teachers to undergraduate students from other divisions of the University and to students registered in graduate programs.

## General Information

The College of Education is concerned with those students who are planning a career in the field of education. Undergraduate programs are designed so each student can include a substantial amount of college work in general education and can concentrate in an academic area closely related to that of his or her special teaching interests. Basic professional work in education is included in the programs.

Additional information about programs may be obtained by writing the Director of Admissions or the Dean of the College of Education.

## Admission

Students ordinarily are admitted to the College of Education as first-year students in the four-year program. The specific admission requirements are given in the "Admission" section of this catalog. A student admitted with advanced standing must satisfy all basic entrance requirements in the College of Education.

## Program Options

Generally students are involved in either program options A, B, or C. Students in the Art Education and Health Physical Education and Recreation programs are enrolled in each respective program.

### Option A - Professional Preparation Team

Students admitted to the College of Education seeking a B. S. degree in either elementary or

secondary education prior to completion of their first semester sophomore year will enter the Option A - Professional Preparation Team program.

### Option B - Transfer-CED Summer Session Program

Transfer students into the College of Education and Continuing Education/ Summer Session students seeking a B. S. degree in either elementary or secondary education will enter the Option B program. Under certain conditions, non-traditional students will be enrolled in the Option B program.

### Option C - Certification Seekers

Individuals who have completed a degree or are enrolled in a college other than the College of Education and who wish to be certified through transcript analysis by the State of Maine may seek certification through coursework offered in the College.

## Transfer Students: Admission with Advanced Standing

Students from other institutions who already have completed a portion of college work, or who desire to change their professional plans and enter education, are invited to apply for admission by transfer. Each case will be considered on its own merits. When such students are accepted, they will be given advanced standing in the College of Education for work already completed if it meets the established standards and the specific course requirements of the program to which they are seeking admission.

## Residence Requirements

A minimum of 30 semester hours of credit must be earned as a student at the University of Maine at Orono to qualify a candidate for a degree. This requirement may be met by one academic year of residence or by attending Summer Sessions; however, regularly enrolled students in the University who wish to transfer to the college may find it necessary to complete additional semesters to meet degree require-

ments. For students enrolled in Continuing Education Division and Summer Session courses, the 30 hours of residence credit may be obtained over an extended period of time and need not be continuous. Work taken in C. E. D. is considered resident credit for undergraduate students in the College of Education.

### Summer Session and Continuing Education Students

Students whose only work in the College of Education has been or will be in the Summer Session or Continuing Education Division program are strongly urged to apply for admission to the University as part-time degree candidates. This recommendation applies both to students who expect to work for degrees in the various colleges of the University and to those who have not yet decided on a major. **At least 30 credit hours of Orono courses must be completed to receive a degree from the University of Maine.**

Among the advantages of being admitted to the University are immediate assignment of a major advisor to counsel on registration, requirements, etc., and eligibility for guidance and counseling services. Students who expect their work to be in the Summer Session should apply before their first registration; students whose first work is to be by Continuing Education classes should apply during their first course.

Application for admission should be made directly to the Director of Admissions, University of Maine.

Off-campus students, before enrolling for a course, should ascertain from the Assistant Dean for Academic Services of the College of Education the amount of such work allowed toward fulfilling the requirements for the degree.

Exceptions to these rules will not be permitted except by a vote of the faculty.

### Graduation Requirements

Completion of the required work of the College of Education leads to the degree of Bachelor of Science in Education (B. S. in Ed.).

A minimum of 120 degree hours of required college work is necessary for graduation. Some programs require more than 120 hours such as the specialized program of Health, Physical Education and Recreation which requires a minimum of 130 degree hours. In addition, each student must meet the grade point aver-

ages of the University and his/her respective program in order to graduate.

### General Education Subjects Required.

Information concerning the specific courses required in general education is available from the Office of the Dean. These subjects are: English, speech, social studies, science and mathematics, psychology, fine arts, and humanities.

Recent state legislation and national accreditation requirements may result in program changes. Students are responsible for monitoring current requirements.

### Professional Subjects Required.

The professional subjects required for a degree from the College of Education must meet the current state requirements for a teaching certificate. Additionally, the state has mandated that individuals will have to take the National Teacher Education exam before being certified.

The required professional subjects are designed to acquaint the student with the general aims of education and the techniques and principles of teaching. These courses are arranged so they culminate in the supervised student teaching internship experience.

### Education Courses in the Summer Session and in the Continuing Education Program

Numerous education courses are offered during the Summer Session and by class extension through the Continuing Education Division. Detailed information regarding the Summer Session and the Continuing Education Division course offerings may be obtained from the program's director at Chadbourne Hall, UM, Orono, Maine 04469.

### Double Degrees

A student wishing to pursue double degrees across college lines normally must make a declaration of intent in the sophomore or junior year. The double degree must be in two distinct and separate areas. All requirements of both colleges and both majors must be fulfilled, including major requirements for work required outside the department. Students intending to become candidates for such double degrees must declare their intent to the deans of both colleges no later than the beginning of their

junior years, and familiarize themselves with the requirements of both colleges.

## The Honors Program

The University of Maine offers its Honors Program to above-average students who are interested in cross- and interdisciplinary courses. The faculty of the College of Education believes that genuine excellence in college-level studies means broad competence in an area outside a major field of specialization as well as excellence within it. The college encourages able students to participate. Students may initiate candidacy by requesting written endorsement of their academic advisors.

Honors courses meet general education and major requirements on an individualized basis, determined upon consultation with the faculty advisor and the college's Honors secretary. (See index under "Honors Program.")

## Certificates for Teachers

It should be clearly understood that the State Department of Education, Augusta, Maine, has sole authority to issue certificates for teaching. The office of the Dean of the College of Education, however, is in a position to advise prospective teachers concerning certificates.

To provide for the many types of school positions, the State Department issues several types of certificates. However, upon successful completion of his or her program, and the teacher examination determined by the State of Maine, the undergraduate student in the College of Education generally will be eligible for the provisional teaching certificate at either the elementary or secondary school level, whichever is applicable.

In addition to furnishing courses for its own students, the College of Education acts as a service agency to provide professional training for students from other teaching units of the University who wish to qualify for a teaching certificate. Such students are enrolled in the same classes with students from the College of Education. **It is the responsibility of these students to secure current certification information and the actual certification directly from the State Department of Education.** Additionally, it is very important that individuals who wish to take the appropriate coursework for certification through the College of Education, contact the Assistant Dean for Academic Services or the Certification Advisor to be certain

they know what College requirements have to be met.

## Placement for Teachers

The University of Maine Career Center includes, among its services, assistance to prospective teachers in finding teaching positions, a credentials service, on-campus interviewing, weekly job listings and resume critiques. Information regarding this service may be obtained from the University of Maine Career Center, Wingate Hall, University of Maine, Orono, Maine 04469.

## Bangor Theological Seminary

Regularly enrolled students in the College of Education may register for courses at the Bangor Theological Seminary, not to exceed six credit hours per semester, without payment of additional fees. The College of Education extends a similar privilege to students regularly enrolled at that institution. Such registrations must have the approval of the deans of both institutions and the instructors involved. Credit for courses so taken will be recorded at the institution where the student is enrolled.

While enrolled at the Bangor Theological Seminary, a student may, with the approval of his or her dean and the Admissions Office of the University, also register as a special student in the College of Education on the established fee basis for such courses. Work so taken, if it does not substitute for or duplicate courses taken in the Seminary program, may be counted as advanced standing credit toward the degree in the event a student later registers for a degree program at the University.

## Courses in Education

Professors Bishop, Chiappone, Cobb, Davis, Freeman, Harris, McIntire, Pechinski, Roberts, Salesi, Sanford, Work, Yvon; Associate Professors W. Abbott, Brazee, Coladarci, Donaldson, Estler, First, Hulse-Killacky, Kristo, Perry, Peterson, Pooler, Robineau, Rog, Skehan; Assistant Professors Beach, Breen, Brody, Butterfield, Coulon, Dodd, Edwards, Magnus-Brown, Evans, King, H. Lehnhard, R. Lehnhard, Maddaus, Quaglia, Schutz, Zeph; Instructor Reif; Lecturers Fox, Wallace; Cooperating Professor Lewis; Cooperating Assistant Professor Hicks

Courses numbered 100-299 are associate

and/or lower level baccalaureate degree. Courses numbered 300-499 are upper level baccalaureate courses; with appropriate qualification and permission, they may be taken for graduate credit. Courses numbered 500-599 are graduate level courses; with appropriate qualifications and permission, they may be taken for undergraduate credit. Courses numbered 600-699 are graduate level courses.

## Counseling

### **CEC 450 Guidance and the Teacher**

Role of the classroom teacher in a comprehensive guidance program. Resources available from school counselors and the community. Methods of studying individual pupils. Teacher-parent communication. For classroom teachers at all grade levels. **Cr 3.**

### **CEC 453 Career Education: The Elementary/Middle School**

General overview, conceptual model, and rationale for career development through classroom and curriculum practices. Methods for infusion of career information within regular school subjects. **Cr 3.**

### **CEC 454 Career Education: Secondary School/Adult Education**

General overview, conceptual model, and rationale for career development through classroom and curriculum practices in secondary schools, adult education, and human resource development settings. Methods for infusion of career information within academic and vocational courses. **Cr 3.**

### **CEC 510 Effective Communication in Personal Development**

Training in communication skills for non-counseling majors. **Cr 3.**

### **CEC 523 The Use of Standardized Tests and Inventories**

This course will consider the selection, use and interpretation of commonly used standardized group achievement and ability tests, interest inventories and non-clinical assessment of personality and other affective attributes. Prerequisite: Basic knowledge of measurement and statistics. **Cr 3.**

### **CEC 524 Individual Intelligence Testing**

Intensive training in administration, scoring, and interpretation of the Revised Stanford-Binet Scale, the Wechsler Adult Intelligence Scale. Revised and Wechsler Intelligence Scale Children-Revised. Historical background and

current problems in theory and practice of testing. Prerequisite: EDA 523 or permission. **Cr 4.**

### **CEC 550 Introduction to Community Agency Counseling**

Surveys counseling functions in community agency, private practice and human resource development programs. Emphasizes a holistic approach to developmental, preventative and rehabilitative counseling services. **Cr 3.**

### **CEC 551 Introduction to School Guidance**

Survey of the philosophy, objectives, principles, and practices of school guidance (kindergarten through grade twelve). Provides an understanding of a well-balanced school guidance program. Prerequisite: Counselor Education major or permission. **Cr 3.**

### **CEC 552 Group Work in Human Services**

An introduction for non-counseling majors. Provides students with background in group dynamics, group theory, and the group as a means of facilitating individual growth. Includes dynamic process/group development issues. Prerequisite: Permission. **Cr 3.**

### **CEC 553 The Profession of Counseling**

History, trends, values, and core beliefs underlying the counseling profession. Ethical standards in the counselor-client relationship. Applications to various client populations. Emphasizes self-awareness. Counselor Education Majors only. **Cr 3.**

### **CEC 554 Counseling Children and Adolescents**

Examines the goals of counseling, counseling philosophy and operational issues in counseling children and adolescents. Students will study verbal and non-verbal aspects of counseling by psychologists, psychiatrists, social case workers and school counselors. Includes play techniques. Prerequisite: CEC 553. **Cr 3.**

### **CEC 556 Established Theories of Counseling**

Examines counseling theory and philosophy. Prerequisite: CEC 553. **Cr 3.**

### **CEC 557 Play Media**

Designed for graduate students preparing to become elementary school counselors, teachers and child development specialists. Provides a background in play media theories, uses and techniques which relate to child development.

### **CEC 558 Recent Development in Counseling**

Particularly for the practicing counselor in ed-



educational and other institutional settings, emphasizing pragmatic approaches. Focuses on recent applications of contemporary theories. Prerequisite: CEC 553, CEC 556 or equivalent or permission. Cr 3.

**CEC 559 Career Information in Counseling**  
Collecting, evaluating and using informational materials in career counseling. Cr 3.

**CEC 560 Counselor Education Prepracticum**  
Bridges cognitive courses to the counseling practicum. Uses Personal Growth and Development Center video equipment to provide feedback on skills. Prerequisite: CEC 523, CEC 556, CEC 559, CEC 652. Cr 3.

**CEC 561 Introduction to Student Development in Higher Education**  
Graduate course for students planning to specialize in student affairs in higher education. The course emphasizes student developmental theory as a foundation for student affairs functions. The interdependence of theory and practice will be explored. Prerequisite: permission. Cr 3.

**CEC 562 Impact of College on Students**  
Study of the impact of college on students through research findings; development of an empirical frame of reference, particularly as it relates to student affairs. Prerequisite: CEC 561 or equivalent. Cr 3.

### Administration

**EAD 500 Fundamentals of Administration**  
Examination of the fundamentals and responsibilities of personnel supervision in educational organizations, including establishment of mission, staff roles, supervision and evaluation practices, and staff development. A required introductory course in educational administration. Cr 3.

**EAD 504 The School Administrator and the Pupil Personnel Services**  
A course designed for pre- and in-service school administrators. The major focus of the course is centered on the study of effective pupil personnel programs and the role of the administrator in the planning, implementation and evaluation of such programs. Prerequisite: Graduate standing or permission of the instructor(s). Cr 3.

**EAD 510 Educational Supervision**  
Creative supervision; techniques of working with professional staff; improvement of curriculum; observational and evaluation tech-

niques. Prerequisite: EDB 202, EDB 203, EDB 204 or equivalents. Cr 3.

**EAD 530 School-Community Relations**  
Process, policy development and communications related to the formulation and implementation of a comprehensive school-community relations program. Practical approaches to interacting with citizens, media, and others will be explored. Prerequisite: EAD 550 or equivalent. Cr 3.

**EAD 531 School Law for Administrators**  
The Constitutional framework, legal issues and state statutes affecting the practice of school administration. Special emphasis is given to the impact of recent court decisions on the administrative role in Educational settings. Cr 3.

**EAD 550 Theories of Administration I**  
Provides an introduction to concepts and research findings in social and behavioral sciences basic to the educational administrator. Administrative problems and organizational behavior analyzed from an interdisciplinary perspective. Prerequisite: EDB 202, EDB 203, EDB 204 or equivalents. Cr 3.

### Adult Continuing Education

**EAE 400 Trends in Adult Education**  
Need for and purpose of adult education programs. Consideration of learning, program development, organization, and administration of programs. Emphasis on adult education through the public schools. Cooperative Extension Service, and community agencies. Cr 3.

**EAE 523 Introduction to Adult/Continuing Education**  
Overview of purposes, clientele, origins, forms, content, sponsors and organizations of adult/continuing education. Cr 3.

**EAE 524 Adult Development and Learning**  
Examination of learning theory, life span development and aging. Focus will be on the psychological, sociological, physiological and environmental factors which make adult learners distinct from earlier developmental levels. The concepts and theories studied will be related to adult education and counseling. Prerequisite: permission of instructor. Cr 3.

**EAE 525 The Teaching/Learning Process with Adults**  
Critical examination of the teaching/learning process with adults. Examples of specific topic areas are characteristics of adult learners; needs assessment; methods; group process; and re-

source identification and development. Focus will be on individual and group instruction.

Cr 3.

#### **EAE 526 Community Processes and Leadership in Adult/Continuing Education**

Exploration of the nature of community and community leadership as it relates to adult/continuing education. The community development process and strategies of community development from an applied point of view will be examined. Prerequisite: EAE 523

Cr 3.

#### **EAE 527 Program Development and Evaluation in the Education of Adults**

Theory, principles and concepts in program development and evaluation. Focus will be upon applying this body of knowledge by means of simulation, case study, role playing or other hypothetical situations to the social, economic and environmental problems of people and communities. Prerequisite: EAE 523 or permission.

Cr 3.

#### **EAE 528 Management of Adult/Continuing Education Organizations**

An introduction to the concept, functions and tasks of management in relation to adult/continuing education organizations. Managerial behavior and style will also be explored. Prerequisite: EAE 523.

Cr 3.

#### **EAE 551 Workshop in Adult/Continuing Education**

Development of products applicable for utilization by adult education practitioners; administrator, teacher, or counselor. Stress is placed upon the competency of skill development. Projects such as simulation design, grant proposals, instructional design, and staff development will be undertaken. Activity will be designated as part of the course title at registration. Prerequisite: EAE 523 or permission.

Cr 3.

### **Bilingual Education**

#### **EBI 380 Methods and Materials for Bilingual Instruction**

This exploratory course provides an overview of bilingual education in the school curriculum and examines organizational models, methods, strategies and materials appropriate for bilingual education. Prerequisite: EDB 204, junior standing or permission of the instructor.

Cr 3.

#### **EBI 390 Introduction to Bilingual Education**

This course provides an overview of the many

facets of bilingual education. It reviews bilingual education from an international perspective and examines the purposes and components of various educational models used globally and nationally. Maine's native French-speaking population will provide the focus for case studies.

Cr 3.

#### **EBI 560 Advanced Studies in Bilingual Education**

Research of a specific area of bilingual education related to the student's field of study. Areas of focus may include the following topics: cultural pluralism, language planning, language and culture, cognitive and developmental issues in second language learning. Prerequisite: EBI 390 or permission.

Cr 3.

### **Measurement and Evaluation**

#### **EDA 520 Topics in Educational Measurement**

Covers special topics in educational measurement, such as: applied performance testing, unobtrusive measures, domain-referenced testing, sequential, testing, item, response theory, sources of response bias in cognitive and affective measures, retrospective measurement in the affective domain.

Cr 3.

#### **EDA 521 Evaluation of Instruction**

Basic course in evaluation of instruction for elementary and secondary school teachers. Emphasis placed on utilizing various strategies of evaluation in classroom and school. Prerequisite: EDB 202, EDB 203 or permission.

Cr 3.

#### **EDA 570 Models of Educational Evaluation**

The primary purpose of this course is to study the different models of educational evaluation. The basic procedures for designing and implementing both formative and summative evaluation studies will be illustrated. Prerequisite: EDA 520 or equivalent.

Cr 3.

### **Appraisal and Basic Professional Courses**

#### **EDB 120 Freshman Early Experience Program**

Career-life planning seminar and parallel laboratory (field) experiences in locations off campus. All arrangements, including transportation to laboratory sites, are the responsibility of the College of Education.

Cr 4.

#### **EDB 202 The American School**

Examines the nature, role, purposes, and curriculum of public elementary and secondary schools with special attention to the place and function of the teacher within this social insti-

tution. This is one of the courses prerequisite to student teaching in all regular undergraduate programs. **Cr 3.**

#### **EDB 203 Growth-Learning Process**

The pupil and his learning processes, including learning theories, pupil growth patterns, and selected techniques for the study of pupil development. This is one of the courses prerequisite to student teaching in all regular undergraduate programs. Not open to freshmen.

**Cr 3.**

#### **EDB 204 The Teaching Process**

The procedures of instructional planning, including such items as improved use of small groups, classroom space, and appropriate teaching materials; measurement, evaluation, and reporting of pupil learning. This is one of the courses prerequisite to student teaching in all regular undergraduate programs. Not open to freshmen.

**Cr 3.**

#### **EDB 205 The American School**

The first course in educational foundations, examines the nature, role, purposes, and curriculum of public, elementary and secondary schools with special attention to the place and function of the teacher within this social institution. The course is offered in conjunction with supervised field experience. Students must enroll concurrently in EDG 398. (1.5 cr hrs per semester. An alternate of EDB 202 for PPT students only).

**Cr 1.5.**

#### **EDB 206 The American School**

The first course in educational foundations, examines the nature, role, purposes, and curriculum of public, elementary and secondary schools with special attention to the place and function of the teacher within this social institution. The course is offered in conjunction with supervised field experience. Students must enroll concurrently in EDG 398. (1.5 cr hrs per semester. An alternate of EDB 202 for PPT students only).

**Cr 1.5.**

#### **EDB 207 The Teaching Process**

The procedures of instructional planning, including such items as improved use of small groups, classroom space, and appropriate teaching materials; measurement, evaluation, and reporting of pupil learning. This is one of the courses prerequisite of student teaching in all regular undergraduate programs. (1.5 cr hrs per semester. An alternate of EDB 204 for PPT students only).

**Cr 1.5.**

#### **EDB 208 The Teaching Process**

The procedures of instructional planning, in-

cluding such items as improved use of small groups, classroom space, and appropriate teaching materials; measurement, evaluation, and reporting of pupil learning. This is one of the courses prerequisite of student teaching in all regular undergraduate programs. (1.5 cr hrs per semester. An alternate of EDB 204 for PPT students only).

**Cr 1.5.**

#### **EDB 221 Educational Psychology**

The scientific study of human development, learning, cognition, and teaching. Emphasis is on theory and research and their application to educational problems. Prerequisite: PSY 100 and Sophomore standing.

**Cr 3.**

#### **EDB 222 Child and Classroom**

This course continues and extends the study of human growth and development with attention to both typical and atypical patterns. The study of interactions of children in groups leads to a consideration of such classroom issues as motivation, discipline and evaluation of student performance. A study of the skills of observation and analysis precedes the placement of students in a field experience. Prerequisite: EDB 221.

**Cr 4.**

#### **EDB 262 Special Topics in Elementary Education**

Current issues and problems in elementary education presented in modular format.

**Cr 1-3.**

#### **EDB 272 Special Topics in Secondary Education**

Current issues and problems in secondary education in modular format.

**Cr 1-3.**

### **Curriculum**

#### **EDC 313 Principles of Curriculum Construction (Conservation) for Elementary School Teachers**

Open to all elementary teachers who have completed a Conservation Education Workshop or its equivalent. Production of instructional materials on natural resource conservation for schools. Opportunities for writing reference and reading materials for children, units of study, instructional guides, bibliographies, and for making many types of visual aids useful in teaching conservation at the various school levels.

**Cr 3.**

#### **EDC 320 Principles of Team Teaching**

The Theory and practice of instructional teams. Emphasis on cooperative planning, pupil groupings, and curriculum innovations. Prerequisite: EDB 202, EDB 221, EDB 204 or their equivalents.

**Cr 3.**

**EDC 323 Principles of Curriculum Construction (Conservation) for Secondary School Teachers**

Education Workshop or its equivalent. Production of instructional materials on natural resource conservation for schools. Opportunities for writing reference and reading materials for children, units of study, instructional guides, bibliographies, and for making many types of visual aids useful in teaching conservation at the various school levels. **Cr 3.**

**EDC 332 Student Activities in Secondary Schools**

The place, organization and direction of student activities in the modern secondary school. Prerequisite: EDB 202, EDB 221, EDB 204 or their equivalents. **Cr 3.**

**EDC 333 Curriculum Development and Evaluation**

Provides the prospective teacher with an overview of theory and research in the field of curriculum, plus "hands-on" experience in curriculum development. Historical, philosophical and sociological perspectives on both the explicit and the hidden curriculum. Exploration and guided practice in the processes of writing and evaluating curricula for local school districts. Prerequisites: EDB 202, EDB 204, EDB 221. **Cr 3.**

**EDC 470 Teaching Maine Studies K-12**

For teachers of social studies at all grade levels who are teaching or wish to teach about Maine. Provides background, methods, and instructional resources to teach about Maine's social life, geography and natural resources, government, and economy. Treats topics from historic to future perspectives and from local, state, national, and global dimensions. **Cr 3.**

**EDC 511 Planning the Elementary School Curriculum**

Aims and philosophy of elementary education; status of the curriculum; factors affecting curriculum changes, development and modern child psychology. Prerequisite: EDB 202, EDB 221, EDB 204 or equivalents. **Cr 3.**

**EDC 521 Planning the Secondary School Curriculum**

Plans of curriculum revision and reorganization, special attention to reorganization to bring the curriculum into harmony with needs of modern life. Prerequisite: EDB 202, EDB 221, EDB 204 or equivalents. **Cr 3.**

**EDC 524 Curriculum and Organization of Middle Schools and Junior High Schools**

A thorough development of the educational program for pre and early-adolescents, beginning with growth and development issues: curriculum planning processes, curriculum development in various subject areas and across subjects, and organizational issues. **Cr 3.**

**EDC 533 Dynamics of the Curriculum**

Examines various problems and issues of curriculum development which are common to all areas of instruction and all educational levels. Participants will have an opportunity to acquire concepts and skills which may be applied to the curriculum development process in local school districts. Active involvement in exploring a wide variety of resources will be encouraged. Prerequisites: EDB 202, EDB 204, EDB 221 or equivalents. **Cr 3.**

**EDC 550 Curriculum and Methods for Economic Education**

Basic economic and consumer education concepts and contemporary issues affecting the national economy, with special attention to the Maine economy. Students will examine these concepts and issues and develop teaching materials for implementation in their classrooms applicable to k-12 teaching. Prerequisites: Employment in a public or private school and/or permission. **Cr 3-6.**

**EDF 201 Great Ideas, Critical Issues**

A selective introduction to the liberal curriculum, through multidisciplinary studies of recurring ideological tensions in western civilization, especially as reflected in conflicts between the individual and society. Emphasis upon close reading and critical discussion through extensive and basic prose writing. **Cr 3.**

**General Courses**

**EDG 298 Professional Preparation Team Field Experience**

Only for first and second year students in the Professional Preparation Team (PPT) program. Provides opportunities to observe in public school classrooms, complete activities, and assist the teachers. To be taken simultaneously with EDB 205, EDB 206, EDB 207 or EDB 208. May be taken for up to four semesters. **Cr 1.5 - 3.**

**EDG 398 Problems in Education**

Individual work on a problem of the student's

own selection. Primarily for majors in education. **Cr Ar.**

### **EDG 399 Professional Preparation Team Senior Seminar**

Only for seniors in the Professional Preparation Team (PPT) program. Provides an opportunity to learn about issues of professional interest, to identify and research a particular issue in depth and to become oriented to the particular teacher and class with whom they will be doing their internships (student teaching). To be taken during the semester preceding internships. **Cr 1.**

### **EDG 400 Field Observation (Activity)**

Study of educational programs by visitation, consultation and appraisal of practices in selected schools, instructional centers, clinics, laboratories and community agencies. Analysis of observations with research, theory and practice. Prerequisite: permission. **Cr 1-6.**

### **EDG 410 Workshop for Cooperative School Personnel (Activity)**

A workshop on the nature and scope of the activities of the supervisor, resource teacher, team leader, critic teacher, aides with other school personnel. The literature, research, practices and materials relating to effective utilization of cooperating school personnel as indicated. **Cr 3.**

### **EDG 498 Problems in Education**

Individual work on a problem of the student's own selection. Primarily for majors in education. **Cr Ar.**

### **EDG 595 Educational Research**

Evaluation of selected research in education. Appropriateness of design to the stated purpose of the study; the selection and presentation of a research problem with special attention to its design and studies related to it. Prerequisite: EDS 521. **Cr 3.**

## **History and Philosophy of Education**

### **EDH 102 History of Education**

A study of educational thought in its historical bearings with particular emphasis on current modes of thought relative to the values, objectives, purposes, and outcomes of American education. Not open to freshmen. **Cr 3.**

### **EDH 145 Education Sociology**

Major principles of sociology applied to the institution of education; the culture concept and its use in perceiving and understanding the diversity of the social system in relationship to

the school and education; school-community interaction, social groups and patterns of social behavior. **Cr 3.**

### **EDH 330 Trends in Education**

Discussion of issues in American education as they relate to current and emerging practices in organization curriculum and teaching in the schools. **Cr 3.**

### **EDH 351 Education for Intercultural Understanding**

Forces of international, racial and religious conflict in contemporary community life; ways in which schools teach understanding of an adjustment to such cultural conflicts. **Cr 3.**

### **EDH 410 Foundations of Community Education**

Traces the development of community education, as a definitive practice, from its beginnings in the mid-1930 's to the present. Particular attention will be given to community education's relationship to political, economic, social, and educational concerns prevalent among today's citizens. **Cr 3.**

### **EDH 499 Seminar in the Foundations of Education**

A seminar offered by the faculty in which the nature, role, policies and curriculum of elementary and secondary schools are re-examined. Special attention given to the place and function of the teacher within this social institution. Prerequisites: STT 490, 491, 494 or concurrent registration. **Cr 3.**

### **EDH 500 Social Context of Education**

Social and historical foundations of education in the U. S. Competing interpretations of the relationship between schools and society; the impact of race, class, and gender on education, and issues of continuity and change regarding policy and practice. **Cr 3.**

### **EDH 531 School Law and the Teacher**

A study of the legal bases of public education with illustrations drawn from the State of Maine. Prerequisite: EDB 202, EDB 221, EDB 204 or equivalents. **Cr 3.**

### **EDH 561 Comparative Education**

Analysis of forces that create differences between national systems of education of England, France, U. S. S. R. and the United States. Prerequisite: EDB 202, EDB 203, EDB 204 or equivalents. **Cr 3.**

### **EDH 565 History of Higher Education in the United States**

History of American higher education, colonial

period to the present. The growth of the classical curriculum, university movement, land grant reform, general education movement, and post-World War II expansion. Cr 3.

#### **EDL 420 Changing Roles of Men and Women in Education**

This course provides an understanding of the factors creating changing definitions of sex roles in the U. S. , the implications of these changes for all levels of the educational system, theories and research related to the schools' role in sex-role socialization, skills in the identification of sex-role stereotyping, and an overview of innovative approaches, programs and practices designed for educational change.

Cr 3.

#### **EDM 520 Teaching in Middle School/Junior High School**

A review of the unique demands that children in grades five through eight place on teachers as a direct result of normal developmental patterns. The focus will be upon generating specific teaching behaviors that deal effectively with each of these demands, with special attention to problems relating to peer influences, periodicity of brain growth, and effects of uneven growth patterns. Prerequisite: teaching experience or permission.

Cr 3.

### **Research**

#### **EDS 510 Introduction to Educational Research**

Introduction to educational research for graduate students in education and related fields. Topics include: locating educational research reports, abstracting and evaluating sources, understanding statistical symbols, examining inquiry methodology and communicating about research. Designed for consumers of research. Prerequisite: graduate status or permission. Lec 3.

Cr 3.

#### **EDS 520 Educational Measurement**

Basic measurement theory; construction of test items in achievement and aptitude; evaluation of teacher-made and standardized tests; descriptive statistical techniques used in educational measurement.

Cr 3.

#### **EDS 521 Statistical Methods in Education**

Introduction to descriptive and inferential statistics as applied to education and human behavior. Emphasis is on parametric statistics.

Cr 3.

#### **EDS 530 Naturalistic Observation Research in Learning Environments**

The acquisition of foundational knowledge and practical application of ethnography, interaction analysis, duration recordings and other naturalistic observation techniques for the study of learning environments. Specific focus will be on current trends in classroom research methodologics, literature reviews and proposal designs.

Cr 3.

#### **EDS 571 Qualitative Research: Theory, Design and Practice**

Examination and use of phenomenological approaches to social science research, emphasizing ethnographic methods in education and human service settings. Field work required. Typically offered over two semesters. Prerequisites: EDS 521, EDS 530 or equivalent and permission.

Cr 3.

#### **EDU 400 Computers in Education**

Introduction to the computer for students majoring in education. Nature and use of the computer and the impact it has had on the curriculum and other areas of education are studied. Laboratory experience in developing practical programs using the computer included. Prerequisite: permission.

Cr 3.

#### **EDU 481 Educational Travel (Area)**

A summer session study tour to provide an insight into the educational, social, economic, historical, and geographic aspects of the locale visited. Consideration to those areas that have made major contributions to our cultural heritage. Tours currently conducted in U. S. , Europe, Maritime Provinces and Quebec.

Cr 3-6.

#### **EDU 520 Micro-Computer Instruction in Education**

A basic understanding of the theoretical and practical aspects of Computer-Assisted Instruction (CAI) and Computer-Managed Instruction (CMI) including discussion of CAI/CMI authoring systems and applications of CAI/CMI in educational settings. Major emphasis will be placed on reviewing, evaluating and selecting microcomputer software which can be used in curriculum. Prerequisites: EDU 500 or permission.

Cr 3.

#### **EDU 540 Microcomputer Based Instruction in Special Education**

Exploration and application of how microcomputer based instruction can be effectively util-

ized with handicapped students. Prerequisites: EDU 500, SED 300. Cr 3.

#### **EDU 580 Educational Institute (Activity)**

Provides understanding and insight into areas of special concern in education: education of the teacher of the disadvantaged; teaching the retarded; guidance counselor; reading specialist; social studies and the school administrator. Attention given to literature, research, practices and materials relating to an aspect of education. Cr 1-6.

#### **Vocational and Driver Education**

##### **EDV 251 Basic Driver Education**

A short, basic, intensive course in driver education for teachers has been arranged in cooperation with the American Automobile Association. Designed to aid high schools in establishing plans for a course in driver education. Not for teaching an individual how to drive. Cr 3.

##### **EDV 252 Driver and Traffic Safety Education**

An intensive course in driver and traffic safety education for teachers who have completed the basic course in driver education, EDV 251, and have had at least one year's teaching experience in this area. Problems experienced by teachers in teaching driver education and highway safety. Prerequisite: EDV 251. Cr 3.

##### **EDV 253 Driver Education Simulation**

Provides driver education teachers with the necessary knowledge and skills to effectually utilize driver education simulation as part of the total driver education program. Cr 3.

##### **EDV 254 Basic Motorcycle Driver Education**

Trains Maine driver education teachers in motorcycle driver education to prepare them to meet the requirements of the 1973 motorcycle legislation. Includes both classroom and laboratory (on-the-road) activities. Prerequisite: EDV 251. Cr 3.

##### **EDV 550 Systems and Practices in Vocational Education**

The major purpose of this course is to orient school administrators, counselors and personnel workers to the goals and objectives of vocational education. An overview of major vocational delivery systems, funding laws and curriculum innovations will comprise the essential content of this course. Particular emphasis will be given to the development and implementation of vocational education in

Maine. It is imperative that school administrators and personnel directors understand the mission and goals established. Cr 3.

##### **EDW 462 Workshop in Elementary Education (Activity)**

A workshop to increase the competence of the elementary school teacher, supervisor, curriculum director, administrator, and other school personnel. The literature, research and materials concerned with a special aspect of elementary education. Cr 1-6.

##### **EDW 472 Workshop in Secondary Education (Activity)**

Workshop to increase competence of the teacher, administrator, and other school personnel. Attention given to literature, research and materials concerned with a special aspect of secondary education. Cr 1-6.

#### **Mathematics Education**

##### **EMA 314 Teaching Mathematics in Elementary School**

Mathematics curriculum in the elementary school; methods and techniques in teaching mathematics; arithmetic readiness program; instructional and evaluation material. An introductory course. Prerequisite: MAT 107 and PSY 100. Cr 3.

##### **EMA 551 Newer Practices in Mathematics Education**

Objectives, materials and procedures for improvement of teaching fundamentals of arithmetic and a mathematics readiness program, a sensible drill load, and development of meaningful problem units. Prerequisite: EMA 314 or equivalent. Cr 3.

##### **EML 595 Seminar in Middle Level Education**

Examines current issues in middle level education research and practices: curriculum, communicating with the public, the middle level school in the K-12 spectrum, parent programs and staff development. Prerequisite: EDC 524 or permission. Cr 3.

##### **EPT 522 Advanced Educational Psychology**

A seminar to explore theoretical and empirical issues in educational psychology. Prerequisites: EDB 221 and EDS 521 or equivalents. Cr 3.

#### **Reading/Language Arts**

##### **ERL 313 Teaching of Reading in the Elementary School**

General background for teaching reading in the

elementary school; early literacy; relationships between reading and writing; comprehension, word analysis, skills, directed reading lessons, literature based reading and writing programs, recreational reading and evaluation. An introductory course. Prerequisite: PSY 100; open to juniors and seniors. Cr 3.

#### **ERL 317 Children's Literature**

An overview of literature written for children between the ages of four and twelve. Emphasis will be placed on developing means of evaluating various types of books and selecting for individual children. Prerequisite: Junior standing and with at least one literature course as a prerequisite. May be taken concurrently with ERL 313 and ERL 318. Cr 3.

#### **ERL 318 Teaching Language Arts in the Elementary School**

Current methods and materials in teaching the writing process including the relationships between reading and writing; conferencing procedures; handwriting, spelling, and oral language development; analysis and correction of basic difficulties. Prerequisite: PSY 100; Open to juniors and seniors. Cr 3.

#### **ERL 440 Teaching Reading in the Secondary School**

An exploratory course for high school teachers who wish to develop competence in teaching reading. The nature of the reading process, rationales for continuing reading instruction in junior and senior high schools, teaching reading and study skills, improving rates of reading, organization, evaluation. Cr 3.

#### **ERL 450 Newer Practices in Reading**

Objectives, materials, and procedures for the improvement of the teaching of reading; methods and materials used in evaluating the reading program; comparison of current practices in reading instruction. Prerequisite: ERL 313 or ERL 440 or their equivalents. Cr 3.

#### **ERL 460 English and the School Teacher**

The study of English as a language and several of its facets: grammars, usage, spellings, for school personnel who wish to develop language arts units and curricula in the elementary and secondary school. Emphasis on the use of findings of contemporary research and literature as the base for language arts instruction. An upper-level undergraduate course. Prerequisites: ENG 101, ERL 318. Cr 3.

#### **ERL 495 Understanding Reading**

Knowledge relating to the processes of (1) learning to read and (2) proficient reading are

the concerns of this course. Presents theoretical and empirical information about the following topics: communication, structure of language, acquisition of speech, physiology in reading, learning to read, and proficient reading. Prerequisite: sophomore standing. Cr 3.

#### **ERL 517 Literature for Children**

A continued examination of literature appropriate for children, including a study of the historical development; principles, techniques and curriculum planning associated with the guidance of children's reading; book selection for the elementary schools and the public libraries. Extensive reading and evaluation of children's books. Prerequisite: ERL 317 or its equivalent. Cr 3.

#### **ERL 518 Literature for Young Adults**

Study of the development of the literature for adolescents and young adults as it is used in the junior high, secondary school, and public library. Emphasis is on the current publication of books of this nature and the important contributions of the past. Cr 3.

#### **ERL 519 The Library in the School Program**

Consideration of the interrelating roles of the librarian and teacher in designing programs, materials, and activities for the learning and reading experiences of students. Intended for teachers and librarians. Cr 3.

#### **ERL 520 Storytelling**

Designed for teachers, librarians, or individuals interested in the art of storytelling. Included are techniques and materials for storytelling. Practice work with children in schools and libraries. Prerequisite: ERL 317 or permission. Cr 3.

#### **ERL 530 Advanced Study in Language Arts**

Intensive study of literature, research, and current practices in teaching language. For thesis candidates. Prerequisite: permission. Cr 3.

#### **ERL 535 Developmental Reading**

Exploration of the fundamentals of reading instruction including history of approaches to reading instruction, early reading, content reading, and current issues in reading instruction. Cr 3.

#### **ERL 536 Writing Process in Schools**

Process approach to teaching writing with emphasis on language acquisition, cognition, components of a writing program, conferencing and modeling strategies, classroom management, evaluation, researcher and implementer. Cr 3.



**ERL 553 Remedial Reading and Writing**

Discussion of both process and product assessment measures for reading and writing and factors affecting these areas. Exploration of a range of instructional options for individuals, small groups and classrooms. Prerequisites: ERL 535 and ERL 536 or equivalents or permission. Cr 3.

**ERL 569 Clinical Practices in Reading and Writing**

Supervised experience in diagnoses, prescription, and implementation of reading and writing instruction for small groups of students (K-12). Analyses and interpretation of test data and preparation of case report writing. Prerequisite: ERL 553 or equivalent or permission. Cr 3-6.

**ERL 590 Special Topics in English Language Arts and Related Fields**

Presented as need, interest, and research require, including such topics as word processor and writing instruction, comprehension and cohesion, reading and writing in the content areas, vocabulary development, reading and cognition, ethnographic research in the language arts, and teacher as researcher. May be repeated for different topics. Prerequisite: Permission. Cr 1-3.

**Science Education****ESC 316 Teaching Science in the Elementary School (K-8)**

Presents information and activities to allow students to learn and develop goals and objectives; instructional strategies; selection of curriculum materials K-8; effective management and evaluation techniques. Prerequisite: EDB 221, EDB 204 or EDB 207, EDB 208 and 2 science courses (preferably from different disciplines e.g., Life or Earth or Physical Science). Cr 3.

**ESC 340 Studies in the Physical Sciences I**

An interdisciplinary study of the physical sciences intended to build science attitudes and knowledge of physical science at pre-service and inservice stages for elementary and junior high school teachers. Laboratory-centered investigations in such areas as light, structure of crystals, liquids and gases, motion and forces, and energy. Cr 3.

**ESC 342 Studies in the Earth Sciences I**

For elementary/middle school teachers. A series of elementary laboratory and field studies in astronomy and meteorology. Topics selected

will be those that can be explored through direct observation and study. Cr 3.

**ESC 343 Studies in the Earth Sciences II**

For elementary/middle school teachers who need some introductory information in the earth sciences of geology and soils. Where possible, the studies will be undertaken in a natural setting using equipment and materials appropriate to the learning tasks. Cr 3.

**ESC 348 Natural History-Inland (K-12)**

Introductory field studies for pre-service or inservice teachers focussing on the natural habitats found in areas surrounding the Orono campus. Emphasis on plants and animals in their environment, their behavior and structural adaptations. Cr 3.

**ESC 426 Methods of Teaching Environmental Education (K-12)**

Classroom and field-based studies of a broad spectrum of up-to-date environmental teaching methods and resources. Prerequisites: ESC 316 or ESC 452 and permission of instructor. Cr 3.

**ESC 441 Studies in the Physical Sciences II**

The course is laboratory-centered and includes Investigations in such areas as bonding in crystals, electric charges, atomic models, ions, molecules, non-ionic substances. Prerequisite: ESC 340 and permission of instructor. Cr 3.

**ESC 444 Basic Field Ecology**

For teachers (K-12) who wish to learn about the natural environment by carrying out field studies in a variety of biotic communities. Emphasis will be on experimental procedures appropriate to school students and important concepts of ecology. Prerequisite: Permission of instructor. Cr 3.

**ESC 446 Marine Education for Elementary and Middle School Teachers (K-8)**

Designed to help elementary/middle school teachers learn about the world's oceans from a multidisciplinary perspective. Particular focus on the Gulf of Maine. Course topics include geology, physical and chemical oceanography, ecology, natural resources. Cr 3.

**ESC 447 Marine Education for Secondary Teachers**

Designed to help secondary school teachers learn about the world's oceans from a multidisciplinary perspective. Particular focus is the Gulf of Maine. Course topics include geology, physical and chemical oceanography, ecology, natural resources. Field experiences in Acadia

National Park, Mount Desert Island and other significant coastal locations in Maine are a major component of this course. Marine education curriculum materials and appropriate instructional strategies are also emphasized.

Cr 3.

#### **ESC 452 Teaching Science in the Secondary School**

Instructional strategies and general approaches to teaching science in middle level and secondary school science classes (7-12). Emphasis on professional literature, curriculum development, teaching and learning styles and reflective teaching. Prerequisite: EDB 221 and EDB 204 or EDB 207, EDB 208.

Cr 3.

#### **ESC 463 Workshop in Environmental Education for Elementary Teachers**

Natural resource concepts from an ecological perspective. Students will develop a course design to teach these concepts in an elementary school classroom. Instruction includes how to access curriculum resource data bases, the use of both indoor and outdoor activities to teach about natural resources, and selection of intended learning outcomes appropriate for elementary students.

Cr 3.

#### **ESC 473 Workshop in Environmental Education for Secondary Teachers**

Natural resource concepts from an ecological perspective. Students will develop a course design to teach those concepts in a secondary classroom. Instruction includes how to access curriculum resource data bases, the use of both indoor and outdoor activities to teach about natural resources and selection of intended learning outcomes appropriate for secondary students.

Cr 3.

#### **ESC 516 Advanced Studies in Science Education (Elementary)**

Studies include a critical appraisal of contemporary programs in elementary school science, review of relevant research in educational science at this level, practice in planning and conducting laboratory and field investigations. Prerequisite: ESC 316 or equivalent.

Cr 3.

#### **ESC 525 Planning the Environmental Curriculum**

A course designed to develop skills and abilities of the participant for environmental education curriculum program development. Prerequisite: ESC 350, or teaching experience in science and/or environmental education.

Cr 3.

#### **ESC 542 Advanced Studies in Science Education (Secondary)**

Studies include critical appraisals of curriculum and teaching practices at elementary and secondary school levels. Focus is placed on surveying current literature in science education. Prerequisite: ESC 352, or ESC 316 or equivalents.

Cr 3.

#### **ESS 315 Teaching Social Studies in the Elementary School**

Methods and materials for social studies in the elementary school; ways of relating the work of the social studies class to the understanding of practical problems of the community. Not open to freshmen.

Cr 3.

#### **ESS 320 Teaching Geography in the Elementary School**

Materials, methods, devices, activities, and appropriate background information to the program of teaching geography in the school. Not open to freshmen.

Cr 3.

#### **ESS 343 Teaching Geography in the Secondary School**

Materials, methods, devices, activities, and appropriate background information to the program of teaching geography in the school. Not open to freshman.

Cr 3.

#### **ESS 441 Teaching Social Studies in the Secondary School**

Current practices in teaching social studies; selection and use of instructional materials; modern trends in curriculum construction for social studies in the secondary school. Not open to freshmen.

Cr 3.

#### **ESS 515 Contemporary Issues in Social Studies Education**

Focus on current trends in social studies education in relation to the historical and philosophical foundations and to implications for practice. Prerequisites: ESS 315, ESS 341 or equivalent.

Cr 3.

#### **ESS 541 Social Studies Curriculum**

Studies in development of the curriculum, materials, resources, and methods of social studies instruction. Prerequisites: ESS 315, ESS 441 or equivalent.

Cr 3.

#### **Media**

##### **INM 433 Instructional Media**

Basic course in the improvement of learning and teaching through the effective use of instructional media and related materials. Learning principles in relation to visual com-

munication media; nature and applications of media and instructional materials; evaluation and selection of media and instructional materials. **Cr 3.**

#### **INM 434 Media Production**

Planning and producing inexpensive instructional materials for both elementary and secondary school subjects; involving either photographic or graphic media. **Cr 3.**

#### **INM 537 New Media in Education**

Development and utilization of new media in educational instruction. Prerequisite: EDB 202, EDB 221, EDB 204 or equivalents. An advanced course. **Cr 3.**

### **Special Education**

#### **SED 400 Survey of Exceptionality**

A general overview of special education to assist the development of an awareness of exceptional children. Study will focus on characteristics, identification procedures, educational provisions, and relevant issues and concerns related to categories of exceptional children. **Cr 3.**

#### **SED 401 Introduction to the Education of Severely Handicapped Students**

This course will provide an overview of the severely handicapped child/adolescent and his/her complex educational needs. Included will be: history of education of the severely handicapped; service delivery models; terminology; etiology; the role of other related disciplines; and, health related issues. Prerequisites: Experience with the severely handicapped (professional or volunteer), SED 400. **Cr 3.**

#### **SED 402 Mainstreaming Exceptional Students**

Integrating exceptional students into the regular education program. Prerequisites: EDB 204 or EDB 207, EDB 208 and EDB 221. **Cr 3.**

#### **SED 430 Assessing the Learning and Behavior of Exceptional Children**

A skills course in which students will have the opportunity to gain knowledge and competencies related to informal assessment of children's academic performance, development, and social behavior. Prerequisite(s): Field experience in special education, SED 400. **Cr 3.**

#### **SED 440 Behavioral Intervention in Educational Settings**

Explores various methods of teaching appropriate classroom behaviors. Behavior modifica-

tion and psycho-social interventions. Students focus on both the behavior of children in classrooms and the environmental factors which affect behavior. Field placement required for course activities. Prerequisite(s): field experience in special education, SED 400. **Cr 3.**

#### **SED 460 Characteristics and Identification of the Gifted and Talented**

Offers students an opportunity to explore the history, characteristics and identification procedures of gifted and talented education. The national perspective and leading state identification models will be studied with special attention directed toward meeting the educational needs of the gifted and talented living in rural communities. Prerequisite: EDB 203. **Cr 3.**

#### **SED 465 Educational Programming for Exceptional Children**

Examines educational, social and vocational planning for the handicapped in both school and the community. Educational curriculum, curriculum development, legal requirements, funding sources and the organization of state and private agencies. Prerequisite(s): Field experience in special education, SED 400, SED 460. **Cr 3.**

#### **SED 470 Methods of Teaching the Retarded Child**

Methods, materials, and techniques in teaching retarded children at the special class level. Prerequisite: SED 400. **Cr 3.**

#### **SED 475 Instructional Strategies for Exceptional Children**

An examination of various clinical teaching methods appropriate for children with intellectual, behavioral and/or learning deficiencies. Prerequisite(s): field experience in special education, SED 400. **Cr 3.**

#### **SED 509 Curriculum Development for Severely Handicapped Students**

In-depth study of curriculum for severely handicapped students. Presents a broad definition of curriculum; curriculum content; philosophical foundations for curriculum; curriculum models; and curriculum development and or change within programs for the severely handicapped. Prerequisite: SED 536. **Cr 3.**

#### **SED 510 Planning the Curriculum for the Retarded Child**

Aims and philosophy of education for the re-

tarded child, status of the curriculum, factors affecting current curriculum changes. Prerequisite: SED 400 or equivalent. Cr 3.

**SED 515 Organization and Management of the Special Education Resource Program**

This course will offer students an opportunity to explore the rationale, history, and current status of public school efforts to educate moderately and mildly handicapped children. Various models will be examined with primary emphasis on the organization and operation of the special education resource program in both elementary and secondary schools. Prerequisite: SED 400, and SED 592 or SED 533. Also by permission. Cr 3.

**SED 520 Administration and Supervision in Special Education**

The preparation of personnel to develop, administer, and supervise special education programs for handicapped individuals at all age levels and with varying degrees of handicapping conditions from mild to severe. Prerequisite: SED 550. Cr 3.

**SED 522 Administration and Supervision of Programs for Severely Handicapped**

An overview of administrative and supervisory considerations in a variety of settings serving severely handicapped individuals, including related laws and regulations; inter-agency cooperation; community and public school integration; staff and program evaluation; staff development; IDT/PET team building; communication and interpersonal relationships, leadership style; and funding issues. Prerequisite: SED 401 or permission. Cr 3.

**SED 532 Teaching Students With Behavioral Disorders**

Approaches teaching constructive social behavior to students with behavioral disorders. Prerequisite: SED 592 or equivalent. Cr 3.

**SED 533 Learning Disability - Theory and Characteristics**

An examination of the major theories related to etiology and treatment for specific learning disabilities. Familiarization with selected tests. Prerequisite: SED 400 or equivalent. Cr 3.

**SED 534 Learning Disabilities-Educational Methods**

Application of major systems and methods of working with school-age children with specific learning disabilities. Development of appropriate programs for individual children. Prerequisite: SED 533 or equivalent. Cr 3.

**SED 536 Educational Strategies For Severely Handicapped Students**

Provides an in-depth analysis of current educational strategies used to educate severely handicapped students. Explores the role of strategies in relation to the overall process of education and curriculum. Prerequisite: SED 401 or permission. Cr 3.

**SED 550 Theories of Exceptionality**

Theories related to the cause and treatment of a variety of handicapping conditions. Historical antecedents of theories and resultant issues and trends are also examined. Prerequisite: SED 400. Cr 3.

**SED 551 Methods and Curriculum for the Handicapped**

Development of instructional strategies for handicapped children and youth. Basic considerations related to educational principles and practices that must be considered in developing effective instructional strategies. Prerequisite: SED 550. Cr 3.

**SED 552 Consultation and Families in Special Education**

Models for consulting with teachers and parents of handicapped children and youth. Prerequisite: SED 400. Cr 3.

**SED 553 Assessment in Special Education I**

Provides experiences with testing instruments designed to assess educational functioning of students ranging from mildly to severely handicapped. Prerequisite: SED 400. Cr 3.

**SED 554 Assessment in Special Education II**

Provides advanced training and preparation in psycho-educational test analysis and dissemination of information related to mild to severely handicapped students. Prerequisite: SED 553. Cr 3.

**SED 555 Transitional Programs for Handicapped Adolescents**

Explores models to prepare handicapped youth in pre-secondary and secondary level programs for post-secondary alternative opportunities. Prerequisites: SED 533, SED 592 and SED 590 or SED 301. Cr 3.

**SED 565 Teaching the Gifted Student**

Methods, materials and techniques for teaching gifted students including curriculum and programming alternatives. Prerequisite: SED 360. Cr 3.

**SED 571 Observation and Practice in Special Education**

An eight-week full-time student teaching ex-

perience in a special educational program for exceptional children. Prerequisite: Permission.

**Cr 6.**

### **SED 586 Workshop in Special Education (Activity)**

Workshop to provide insight into educational problems of mentally retarded, emotionally disturbed, neurologically impaired, deaf, visually handicapped or gifted students. Special attention given to literature, research practices and materials relating to an aspect of special education. Prerequisite: SED 400. **Cr 3-6.**

### **SED 590 Mental Retardation - Theory and Characteristics**

Theories underlying the definitions and treatment of mental retardation. Characteristics of the condition and their relationship to appropriate curriculum are discussed. Prerequisite: SED 400 or equivalent. **Cr 3.**

### **SED 592 Behavior Disorders - Theory and Characteristics**

Theoretical explanations, research and educational assessment strategies related to behaviorally disordered students. Prerequisite: SED 400 or equivalent. **Cr 3.**

### **STT 490 Full-Day Student Teaching (Elementary)**

A full-day, off-campus internship program in a selected school. Prerequisite: Must apply and be granted permission. **Cr 1-12.**

### **STT 491 Full-Day Student Teaching (Secondary)**

A full-day, off-campus internship program in a selected school. Prerequisites: Must apply and be granted permission. **Cr 1-12.**

### **STT 492 Half-Day Student Teaching (Elementary)**

A half-day program of observation and student teaching in a selected school in the University area. The same four consecutive periods must be free daily to schedule course. Conferences and group discussions. Prerequisite: EDB 202, EDB 221, EDB 204 or their equivalents, methods course, and senior standing. **Cr 6.**

### **STT 493 Half-Day Student Teaching (Secondary)**

A half-day program of observation and student teaching in a selected school in the University area. The same four consecutive periods must be free daily to schedule course. Conferences and group discussions. Prerequisites: EDB 202, EDB 221, EDB 204 or equivalents, methods course, and senior standing. **Cr 6.**

### **STT 494 Student Teaching K-12 (Music, Art or Physical Education)**

Observation and student teaching in selected elementary and/or secondary schools. Prerequisites: EDB 202, EDB 221, EDB 204 or their equivalents, methods course, and senior standing. **Cr 1-12.**

### **STT 496 Advanced Internship (Elementary)**

A full-day, off-campus advanced internship, teaching in a selected school. Seminars and conferences. Prerequisite: STT 490 and permission of the Director of Educational Field Experiences. (Pass/Fail Grade Only). **Cr 2-6.**

### **STT 497 Advanced Internship (Secondary)**

A full-day, off-campus advanced internship, teaching in a selected school. Seminars and conferences. Prerequisite: STT 491 and permission of the Director of Educational Field Experiences. (Pass/Fail Grade Only). **Cr 2-6.**

## **Art Education Program**

A four-year program in art education is offered by the College of Education for students who intend to teach art or to become supervisors of art in public or private schools. Majors in art education register in the College of Education and follow a curriculum outlined by the Department of Art in conjunction with the College

of Education. Specific requirements for the degree may be obtained from the Department of Art, Carnegie Hall, or from the College of Education. Upon satisfactory completion of this course of study, the student is certified to teach on both the elementary and secondary levels.

# Health, Physical Education And Recreation Programs

The professional curriculum of the health, physical education, and recreation programs prepares qualified students for service to schools and communities in the areas of teaching, administration, and leadership with a focus on physical education, health-fitness, leisure, and sport. A bachelor of science degree in education is awarded to graduates of this program.

S. Butterfield, Coordinator; Professor Pechinski; Associate Professor Abbott; Assistant Professors Butterfield, Coulon, H. Lehnhard, R. Lehnhard; Instructors Reif; Cooperating Personnel from Department of Physical Education and Athletics: Assistant Professors Anderson, Jordan; Lecturers Ames, Ballinger, Bransfield, Dwyer, Dyer, Fox, Keeling, Lichtenberg, Linder, Ranson, Roberts, Spiteri, Switzer, Wallace, Winkin, Wren, Young

## Courses in Health, Physical Education, and Recreation

### **HPR 222 Personalized Health Fitness**

To develop an understanding of basic principles of health fitness and to develop a personal fitness program. Modern strength training techniques including free weights, plyometrics, and resistance machines. Cr 2.

### **HPR 230 Archery**

Instruction to develop skills and teaching techniques in this leisure activity. Cr 1.

### **HPR 231 Badminton**

Instruction to develop skills and teaching techniques in this leisure net sport. Cr 1.

### **HPR 232 Golf**

Instruction to develop skills and teaching techniques in this leisure activity. Cr 1.

### **HPR 233 Volleyball**

Instruction to develop skills and teaching techniques in this leisure net sport. Cr 1.

### **HPR 234 Racquetball**

Racquetball skills and teaching techniques along with instructions and rules will be presented. Cr 1.

### **HPR 235 Rhythmic Activities**

The purpose of this course is to develop skills, teaching techniques and an understanding of

basic rhythms, particularly as they relate to folk, social, and square dance patterns. Cr 1.

### **HPR 236 Dance Fitness**

To develop skills and teaching techniques in performing and teaching aerobic dance. Cr 1.

### **HPR 237 Swimming Skills**

Teaching and improving the skills in swimming, springboard diving, water polo, and related aquatic skills. Each phase developed carefully and fully, enabling the more capable to learn how to teach these basic skills at each level, including the beginning level. Cr 1.

### **HPR 238 Tennis**

Instruction to develop skills and teaching techniques in this leisure net sport. Cr 1.

### **HPR 239 Relaxation**

Deals with methods and teaching techniques in relaxation and meeting stress. Cr 1.

### **HPR 240 Methods of Teaching and Coaching Track and Field**

Designed to develop proficiency in basic track and field skills and knowledge of methods of teaching and/or coaching track and field. Cr 2.

### **HPR 241 Methods of Teaching and Coaching Basketball**

Practical instruction in basketball to develop skills, techniques and understandings for people preparing to enter the teaching and coaching professions. Cr 2.

### **HPR 242 Methods of Teaching and Coaching Baseball**

Provides the student with the skills, techniques and understandings necessary to teach and/or coach baseball to youngsters representing all ability levels. Cr 2.

### **HPR 243 Methods of Teaching and Coaching Football**

Develops proficiency in basic football skills and knowledge of methods of teaching and/or coaching football. Prerequisite: sophomore standing. Cr 2.

### **HPR 244 Methods of Teaching and Coaching Soccer**

Practical instruction in soccer to develop skills, techniques, and understandings for those preparing to enter the teaching and/or coaching professions. Prerequisite: sophomore standing. Cr 2.

**HPR 245 Methods of Teaching and Coaching Wrestling**

Develops skills, techniques and understandings for competency in wrestling. Deals with the responsibilities of the prospective wrestling teacher and coach. Prerequisite: sophomore standing. **Cr 2.**

**HPR 246 Methods of Teaching and Coaching Gymnastics**

Develops or improves skills in tumbling, apparatus, rhythmic gymnastics; conditioning, spotting techniques, and unit planning in elementary and secondary schools. **Cr 3.**

**HPR 247 Methods of Teaching and Coaching Softball**

Provides the student with comprehensive instructional materials, including the guiding principles for all aspects of the game. Content includes the skills of softball and methods of coaching and teaching. Prerequisite: sophomore standing. **Cr 2.**

**HPR 248 Methods of Teaching and Coaching Field Hockey**

Identifies for the prospective teacher/coach the basic skills and techniques used in field hockey. Emphasis on teaching and coaching methods. Prerequisite: sophomore standing. **Cr 2.**

**HPR 249 Methods of Coaching and Teaching Swimming and Diving**

Stroke analysis, training and conditioning for competitive swimming, springboard diving, basic synchronized swimming and pool management. **Cr 2.**

**HPR 250 First Aid and Emergency Care**

This course involves instruction in, and practice of, first aid and emergency medical care procedures. Students will be required to pass written examinations and practical tests to demonstrate competency in cardio-pulmonary resuscitation and how to correctly handle bleeding, wounds, shock, musculo-skeletal injuries, and various medical emergencies. **Cr 2.**

**HPR 253 Theories of Conditioning**

Familiarizes the student with different physical conditioning regimens and what these programs can and cannot accomplish. Investigates specific traits and components of physical fitness and develops competencies to prescribe conditioning programs to meet specific needs. **Cr 3.**

**HPR 254 Analysis of Basic Skills**

To develop the skills to interpret movement

patterns in a variety of basic and sport skills and prescribe remediation for movement deficiencies. **Cr 2.**

**HPR 260 Camp Leadership**

Designed for training camp counselors, with emphasis on participation in the varied activities of camping. **Cr 2.**

**HPR 263 Methods of Modern Dance**

The purpose of this course is to prepare the student to teach dance in elementary schools. **Cr 1.**

**HPR 269 Foundations of Recreation**

Fundamental concepts, principles, and practices in the field of recreation, with emphasis on historical and philosophical background. **Cr 3.**

**HPR 270 Motor Development and Learning**

The understanding and application of major principles in the development and learning of motor behavior from conception through adolescence. The effects of development in the cognitive and affective domains upon the motor domain. **Cr 3.**

**HPR 271 History and Philosophy of Physical Education and Recreation**

This course is designed to provide an introduction of the fields of health, physical education and recreation. The history and philosophy of both fields will be discussed and career opportunities will be identified. **Cr 2.**

**HPR 273 Prevention and Care of Athletic Injuries**

Prevention and care of common injuries associated with the athletic, school or recreational setting. Use of proper personal and field equipment support methods, medical examinations and therapeutic aids. Prerequisite: ZOL 208. **Cr 3.**

**HPR 278 Health Education**

The purpose of this course is to examine all the factors that influence health. This course serves as a channel for education students in all the choices they have for creating positive, healthy lifestyles. Current health issues and information will be presented and discussed. **Cr 2.**

**HPR 301 Coaching Effectiveness I**

The focus of this course is on the administrative skills needed to properly lead children through a competitive sport experience. Legal concerns in coaching and time management techniques are addressed in detail. The student will gain a thorough knowledge of implementing practice sessions and competitive events which set the

young athlete's welfare as a priority. Successful completion of the course results in Level 2 certification by the American Coaching Effectiveness Program (ACEP). Prerequisite: Junior standing or permission. **Cr 3.**

#### **HPR 302 Coaching Effectiveness II**

The focus of this course is on the physiological and psychological responses of athletes to physical conditioning and a competitive environment. Basic principles of physical training and their proper application will be identified. Psychological foundations will be discussed as they relate to competitive sports. The student will gain a practical knowledge of training guidelines. Successful completion of the course results in Level 2 certification by the American Coaching Effectiveness Program (ACEP). Prerequisite: Junior standing or permission.

**Cr 3.**

#### **HPR 310 Outdoor Preparedness**

Prepares students to meet the challenge of wilderness travel and survival. Map and compass work, summer and winter survival, canoe skills and fitness will be offered. Students will be required to test their skills in field work. Lab fee will be charged.

**Cr 3.**

#### **HPR 340 Outdoor Leadership Training**

Develops and evaluates educational experiences which can be pursued beyond the traditional classroom setting. Emphasis will be on safety leadership and liability and the outdoor education field.

**Cr 3.**

#### **HPR 344 Principles of Coaching**

Principles of Coaching would supply an appreciation and background in the art of coaching. This course would deal with the complex problems facing those that accept the challenge of handling our youth of today in a sport setting. The complete role of the effectiveness of the coach will be surveyed. Field trips to study experienced coaches will be required. Prerequisites: Must be of sophomore standing.

**Cr 3.**

#### **HPR 345 Community Centers and Playgrounds**

Aspects of organization, administration, management, facilities, equipment, and activities of building-centered programs and community playgrounds.

**Cr 3.**

#### **HPR 348 Field Experience**

Supervised experience in conducting recreation programs in camp, community, social agency or institution situations. Enrollment by permission.

**Cr 3-6.**

#### **HPR 350 Educational Gymnastics, Games and Dance**

Development of basic games analysis technique, gymnastic progressions and spotting techniques and group dance development and organization for the elementary and secondary schools. To develop skills in teaching games, dance and gymnastics, utilizing movement themes and activity.

**Cr 3.**

#### **HPR 361 Organization and Administration of Physical Education and Recreation**

This course will provide the student with an opportunity to organize and administer a physical education or recreation program. The student will develop skills in curriculum development, budgeting, bidding and purchasing, scheduling, hiring, evaluating, and insuring as they organize and administrate their program.

**Cr 3.**

#### **HPR 362 Methods-Teaching Physical Education**

Methods of teaching physical education to all grade levels and abilities. Teaching models and practical application of models by students will be stressed. Teaching effectiveness techniques, theories, principles, instructional design and methods of evaluation will be examined.

**Cr 3.**

#### **HPR 363 Curriculum and Instruction in Secondary Physical Education**

This course will provide the preservice teacher with an opportunity to practice learned effective teaching behavior in various teaching settings. The course will also provide the preservice teacher with an overview of secondary schools. Prerequisite: HPR 362.

**Cr 3.**

#### **HPR 364 Elementary School Physical Education**

This course is specifically designed for the elementary physical educator for the purpose of studying the movement education curriculum used in elementary schools. Emphasis will focus on effective teaching techniques, instructional planning and on the progression of skills used in games, dance and gymnastics. A laboratory teaching experience will be implemented at a local elementary school. Prerequisite: HPR 362.

**Cr 3.**

#### **HPR 365 Leadership Organization in the Intra-Extramural Programs**

Principles and philosophy, administration, organization, and supervision of intra-extramural activities in the physical education



program in elementary, junior, and senior high schools. Cr 3.

#### **HPR 367 Mainstreaming in Physical Education-Recreation**

An introductory course to help teachers, coaches, and recreation personnel meet state and federal requirements for equal opportunities for handicapped persons. Content includes etiology and characteristics for handicapping conditions; implications for teaching; direct experience with handicapped persons. Cr 3.

#### **HPR 372 Tests and Measurements in Physical Education-Recreation**

Discussion and use of procedures and instruments for evaluation of persons in physical education, recreation and athletic programs. How to select, construct, administer, score, and interpret tests for psychomotor, affective and cognitive abilities will be emphasized. Cr 3.

#### **HPR 376 Kinesiology**

An introduction to the analysis of human motion based on anatomic knowledge, basic biomechanics and kinesiological principles as they apply to teaching and coaching sport skills. Prerequisites: ZOL 208, HPR 253. Cr 3.

#### **HPR 378 Physiology of Exercise**

Develops an understanding of the integration and regulation of physiological functions during physical activity. Through investigation of factors affecting human performance, and the coordinated adjustment of body functions to the stress of exercise, students will become more aware of the theoretical and practical ap-

plications of exercise science. Prerequisites: ZOL 208, HPR 253, HPR 376. Cr 3.

#### **HPR 380 Health, Physical Education and Recreation Programs in the Elementary School**

Integrates the goals, objectives and concepts of physical education with the curriculum of the elementary school. Emphasis on purposeful, idea-directed movement and the important contributions physical education makes to the health, fitness and development of the elementary school child. Cr 3.

#### **HPR 384 Practicum in Physical Education**

Leadership experiences under staff supervision in the service program. Limited opportunities also exist in local public schools. Consult either Dr. Woodbury or Dr. Cobb before registering. Cr 1-3.

#### **HPR 385 Leadership in Physical Education and Recreation**

Develop skills for programming effective educational and community programs which focus on identified needs of the clients being served. Cr 3.

#### **HPR 398 Problems in Health and/or Physical Education and Recreation**

Individual work on a problem in the area of health, physical education or recreation. Cr 1-3.

#### **HPR 424 Adult Fitness**

Adult fitness is designed as an introductory class which provides the student with a broad theoretical background in the area of adult ex-



ercise and physical training. The role chronic exercise has in the possible prevention and retardation of coronary heart disease serves as the basic premise of the course. Prerequisite: HPR 378. Cr 3.

#### **HPR 425 Wellness Programming**

Will allow the student to be exposed to lifestyle concerns which are typically addressed through intervention programs. Programs to be discussed are as follows: smoking cessation, diabetes, musculoskeletal (osteoporosis, arthritis, low back), weight management and stress management. Students will learn how to incorporate a multi-discipline approach for the management of these specific conditions. Prerequisite: HPR 424. Cr 3.

#### **HPR 426 Exercise Leadership and Class Management**

This course provides specific knowledges, skills and competencies needed to appropriately develop, prescribe, instruct and manage various kinds of exercise programs for diverse populations. Prerequisite: HPR 424. Cr 3.

#### **HPR 455 Philosophy and Organization of Physical Education for Elementary Schools**

The philosophical bases for physical education programs at the elementary school level. Contrasting emphases in the curriculum are studied as well as the implications found in perceptual-motor development research. Cr 3.

#### **HPR 468 Advanced Prevention and Care of Athletic Injuries**

Acquaints teachers and athletic coaches with modern principles and practices in prevention, treatment, rehabilitation, and safety in physical education and athletics. Cr 3.

#### **HPR 483 Planning the Health Education Curriculum**

Assists students in more thoroughly understanding health education in relation to the total school curriculum. Concepts of curriculum development, national considerations, and current research related to health curriculum construction. Cr 3.

#### **HPR 560 Assessment and Evaluation of Human Performance**

The assessment and evaluation of selected anatomical, physiological and psychological aspects of human performance for the purpose of developing prescriptive exercise programs based upon individual needs, goals and interests. Prerequisites: HPR 378 and permission.

Cr 3.

#### **HPR 570 Interpretation of Health, Physical Education and Recreation**

Analytical interpretation of activity through history. Philosophy, methods, measurement, content, public relations and professional preparation. Cr 3.

#### **HPR 572 Planning the Physical Education Curriculum**

Selection of activities, sequentially arranged and organized to produce a curriculum for physical education for the modern school including time allotments, facilities, individual characteristics, problems of appraisal. Cr 3.

#### **HPR 573 Motor Performance and Learning**

Study of motor performance to aid the instructor to provide better theoretical framework to structure learning experiences for skillful individual performance. Prerequisite: EDB 203 and/or permission. Cr 3.

#### **HPR 574 Organization and Administration of Recreation Programs**

Cr 3.

#### **HPR 575 Current Studies in Health, Physical Education, and Recreation**

Analysis of current and emerging trends in health, physical education, and recreation based on experiments, research, literature and empirical observations. Cr 3.

#### **HPR 577 Organization and Administration of Health, Physical Education and Recreation**

Provides the student with an overview of the organization and administration of physical education and recreation programs. Develops an understanding of the essential components (interpersonal interaction, budgeting, scheduling, evaluating, etc.) of an effective program. Cr 3.

Cr 3.

#### **HPR 579 Current Studies in the Administration of Athletics**

Cr 3.

#### **HPR 580 Mechanical Analysis of Human Movement**

Analysis of activities provide the student with scientific basis for teaching and evaluating correct form for execution of the fundamental movements. Prerequisite: HPR 376. Cr 3.

Cr 3.

#### **HPR 581 Recreation in the American Community**

Cr 3.

#### **HPR 582 Physical Education for the Exceptional**

Modifications of instructional programs for atypical individuals in the regular school cur-

riculum. Evaluation of body mechanics, programs of correction, recognition of behavior patterns. **Cr 3.**

**HPR 583 Admin of Elementary and Secondary School Health Programs** **Cr 3.**

**HPR 584 Evaluative Procedures in Health, Physical Education and Recreation**

Introduces the student to various evaluative techniques which are designed to improve teaching effectiveness and student learning. Emphasis will be placed on utilizing various strategies of evaluation in the instructional setting. Prerequisite: HPR 372. **Cr 3.**

**HPR 585 Development of an Adapted Physical Education and Recreation Program**

This course is designed to assist professionals in developing and implementing a full range adapted physical education or recreation program. It addresses the program needs for children and adults of various types and levels of severity of handicapping conditions. Prerequisite: HPR 367 and HPR 372, or their equivalent. **Cr 3.**

**HPR 588 Advanced Exercise Physiology**

The purpose of this course is to broaden the knowledge base of graduate students and to identify potential research areas. The course involves in depth study of selected topics in exercise physiology and requires students to extensively utilize the current research literature. Prerequisite: HPR 378 and permission. **Cr 3.**

**PEG 101 Physical Education**

The instructional program for men and women is designed to provide the student with an opportunity to develop and refine and to add knowledge in a variety of physical activities which the student can use now and in his leisure time in later years. Emphasis is placed on presenting the student with an appreciation

and understanding of the body and its movement, of exercise and its role in one's individual life. In an effort to promote and maintain one's individual physical fitness, each woman or man has the opportunity to select those activities in which she or he has an interest. The program will include a choice of activities; dance golf, physical fitness, racquet sports, swim, tennis. From these choices the students may either choose for depth in skill refinement in an activity or breadth in selection of several activities. For each hour of credit, two hours of instructional time per week, per semester, is required. Each college within the University system accepts credit for PHE 101 as an elective course. (Pass/Fail Grade Only). **Cr 1.**

**PEG 102 Physical Education**

The instructional program for men and women is designed to provide the student with an opportunity to develop and refine and to add knowledge in a variety of physical activities which the student can use now and in his leisure time in later years. Emphasis is placed on presenting the student with an appreciation and understanding of the body and its movement, of exercise and its role in one's individual life. In an effort to promote and maintain one's individual physical fitness, each woman or man has the opportunity to select those activities in which she or he has an interest. The program will include a choice of activities; dance, golf, physical fitness, racquet sports, swim, tennis. From these choices the students may either choose for depth in skill refinement in an activity or breadth in selection of several activities. For each hour of credit, two hours of instructional time per week, per semester, is required. Each college within the University system accepts credit for PHE 102 as an elective course. (Pass/Fail Grade Only).

**Cr 1.**



# College of Engineering and Technology

Norman Smith, *Dean*

Wayne A. Hamilton, *Associate Dean*

Clinton H. Winne, Jr., *Assistant Dean*

The College of Engineering and Technology offers the following study opportunities:

A. Two-year associate of science degree programs, administered by the School of Engineering Technology:

3Civil Engineering Technology  
Electrical Engineering Technology  
Mechanical Engineering Technology

B. Four-year bachelor of science in engineering technology degree programs, administered by the School of Engineering Technology:

Construction Management Technology  
Electrical Engineering Technology  
Mechanical Engineering Technology

C. Four-year bachelor of science degree programs:

Bio-Resource Engineering (jointly with the College of Food, Agriculture and Applied Sciences)

Chemical Engineering  
Civil Engineering  
Computer Engineering  
Electrical Engineering  
Engineering Physics

Forest Engineering (jointly with the College of Forest Resources)

Mechanical Engineering  
Pulp and Paper Technology  
Surveying Engineering

## Graduation Requirements

A. In all programs:

1. An accumulative average not less than 2.0.
2. Passing grades in all required courses.
3. Additional requirements listed under each program description.

B. In the four-year programs leading to bachelor of science degrees in Engineering: Students graduating from engineering programs are required to complete the following:

1. 16 credits of mathematics
2. 16 credits of basic science
3. 32 credits of engineering science
4. 16 credits of engineering design
5. 18 credits of humanities and social science\*
6. All additional departmental requirements listed under each program description.

Many courses contain subject matter in more than one of these categories. A list of courses showing the breakdown by category is maintained by each Engineering Department.

The humanities and social sciences are listed in the catalog under Anthropology, Art, Economics, English, Foreign Languages and Classics, History, Music, Philosophy, Modern Society, Political Science, Psychology, Public Administration, and courses of a cultural and non-technical nature offered in the School of Performing Arts. No more than three credits in applied theatre and three credits in applied music may be applied toward this requirement. English composition, scientific German, and courses treating accounting, finance, industrial management, personnel administration, and statistics do not fulfill this requirement. Each department maintains a list of acceptable social science and humanities courses.

## Cooperative Work-Study Opportunities

A number of cooperative work-study programs are available in the College of Engineering and Technology. Details of each program may be obtained from the appropriate department.

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\*The 18 credit humanities and social sciences requirement also applies to the Bachelor of Science degree in Chemistry and Pulp and Paper Technology.

## Technology and Society

The Technology and Society Project is intended to develop ways to enhance the humanities and social sciences component of undergraduate engineering programs, to work with other colleges in developing the study of technology as a human activity and to infuse this study into the undergraduate curriculum of the university. The project is responsible for operation of a pilot program for Engineering and Technology students involving an interdisciplinary introduction to humanities and social science fields followed by a liberal studies concentration and senior seminar series.

Courses dealing with technological development and with topics involving the interfaces of technology and society are also offered by the project. These courses are usually taught by teams of faculty members in which each member can provide a different perspective on the subject matter. Some courses fulfill part of the Humanities/Social Science requirements for Engineering and Science students. Courses covering the Technology and Society area are:

- HTY 419 Science and Society Until 1800
- HTY 420 Science and Society Since 1800
- HTY 485 World Maritime History I
- HTY 486 World Maritime History II
- HTY 491 Technology and Society Until 1800
- HTY 492 Technology and Society Since 1800
- TSO 198 Technology and Society
- TSO 251 Transportation and Social Change
- TSO 398 Special Topics in Technology and Society

## Courses in Technology and Society

### **TSO 198 Technology and Society**

A survey study of the development of modern technology and its impacts. The interaction of engineering with other facets of modern society will be examined through study of several issues of current or recent interest.

Cr 3.

### **TSO 251 Transportation and Social Change**

An interdisciplinary study of the technological development and social impacts of rail, air, and automobile transportation. The course will be taught by engineers, social scientists, and humanists working as an interactive team. One or more appropriate field trips will be held. Prerequisite: At least sophomore standing or permission of the instructor.

Cr 3.

### **TSO 398 Special Topics in Technology and Society**

Selected subjects in the field of technology and society studies and related areas not covered in other university courses. The course may be taken more than once. Prerequisite: Normally, junior standing or permission of the instructor.

Cr 3.

## Honors Program

Qualified students in the College of Engineering and Technology are encouraged to participate in the University Honors Program. For academic and admission requirements of the Honors Program, consult the index. In the College of Engineering and Technology, the Honors Program consists of two major segments: studies in the humanities and studies in the student's own field. Successful completion of HON 101 or 102 will exempt a student from the college ENG 101 requirement. HON 101 or 102 (whichever is not used to replace ENG 101), HON 201, 202, 301, and 302 may be used towards completion of the college requirements in humanities and social sciences. Other honors work, including the senior thesis (HON 498-499), may be used to replace portions of the curriculum as specified by the chairperson of the student's engineering department. The area of honors work will show on the student's transcript.

## Transfer Credit

All students who transfer to the College of Engineering and Technology from another institution must earn a minimum of 30 hours of "Orono" courses to qualify for the B. S. degree. Degree credit will normally be allowed for courses in which grades of "C" or above have been received. Evaluation of such courses for approval of degree credit and possible equivalency rests with the Dean of the College of Engineering and Technology. Credits from military service schools do not transfer. Normally credits from associate degree programs may be used for elective credits only. Associate Degree level mathematics and science courses do not fulfill the requirements for the B. S. program.

CLEP credit will be granted only for the ap-

appropriate subject exams. No credit is given for the CLEP general examinations.

### Double Major

Double majors are permitted between most disciplines in the College of Engineering and Technology. The requirements for meeting the double major state that a student must meet all requirements of two separate and distinct disciplines. Students also may obtain a double major or double degrees across colleges by satisfying the requirements for both colleges and majors. Students intending to become candidates for double majors or degrees across colleges must declare their intent to the deans of both colleges no later than the beginning of their junior year.

### Away Status

Students wishing to register for "Away" status must be in good academic standing and must obtain prior approval from their academic advisor and dean. Course equivalencies should be determined prior to registration.

Before students of the College of Engineering and Technology pursue Summer Session courses in any institution (including UM), they must be in good academic standing and secure the approval of the dean and the chairperson of the student's major department if they expect degree credit for such work.

### Repeating a Course

When a course is repeated, both grades continue to be used to determine the accumulative point-hour ratio until the student applies for and completes a repeated course form available in the office of the dean. A course may not be repeated after an advanced course in the same field has been passed if the course that the student desires to repeat was a prerequisite for the advanced course.

### Pass/Fail

Students enrolled in the College of Engineering and Technology may not take courses that are to be used to fulfill the degree requirements on a Pass/Fail basis.

### Departments of Instruction

Courses numbered 100-299 are undergraduate courses. Courses numbered 300-499 are upperclass undergraduate courses. Courses numbered 500-599 are graduate courses which may be elected by undergraduate honor students, or those undergraduates whose advancements in the field will permit their taking a graduate level course among graduate students without disadvantage to themselves. Courses numbered 600-699 are graduate level courses which may be taken only by students admitted to the Graduate School.



## Aerospace Studies

Professor of Aerospace Studies Lt. Col. Jerome P. Palanuk Assistant Professors Captain Hawkins, Captain Kaussner, Captain Schneider; NCOIC Master Sergeant Gagnon; Administrative NCO Staff Sergeant Bazile

### Purpose

The Air Force Officer Training Corps (ROTC) is an educational program designed to provide you, as a college student, the opportunity to become an Air Force commissioned officer while completing requirements for an undergraduate or graduate degree. A Four- or Two-Year Program is available.

### Four-Year Program

The more popular and preferred program is the traditional Four-Year Program. You may enroll in Aerospace Studies courses in the same manner as for other college courses. There is no military obligation for the first two years of Air Force ROTC unless you have an Air Force ROTC scholarship. After completing the first two years, known as the General Military Course (GMC), you may compete for the Professional Officer Course (POC) during the last two academic years remaining in college (undergraduate, graduate, or any combination). If accepted, you will attend a four-week summer Field Training between your sophomore and junior years before entering the POC. Cadets in the POC receive a nontaxable subsistence allowance of \$100 each academic month.

### Two-Year Program

The Air Force ROTC Two-Year Program is primarily available to junior college transfers, to veterans, or to colleges and universities that do not offer Air Force ROTC. It's also for those who did not take the first two years of Air Force ROTC. To be eligible, you must have at least two academic years remaining either at the undergraduate level or graduate level or a combination of the two. If accepted, you'll attend a six-week summer Field Training encampment before entering POC.

### Military Obligation

You have no military obligation while enrolled in the first year student and sophomore courses of Air Force ROTC. Only when you enter the Professional Officer Course will you incur an active duty obligation. After being commissioned a second lieutenant, nonflying officers will serve four years of active duty, while pilots serve eight years and navigators five years after completing the training.

### Air Force ROTC College Scholarships

Air Force college scholarships for 2 to 4 years worth around \$10,000-\$40,000 are available on a competitive basis to you in the following career or academic areas:

Selected engineering and science majors (majority in engineering) Selected nontechnical academic majors (very limited; 2 or 4 years); Navigator or missile launch officer with any major (last 3 1/2, 3, 2 1/2, or 2 years of a bachelor's degree); Prehealth profession (physician/osteopath only)(last 2 or 3 years of a bachelor's degree); Nursing (last 2 or 3 years of a bachelor's degree in nursing) Scholarships for 2 to 3 1/2 years are also available to college students in the same majors, as well as 2- and 3- year nursing and premedical scholarships. Application inquiries and submissions are made to the professor of aerospace studies at the Air Force ROTC detachment during your freshman or sophomore year of college. Selections are based on scores achieved on the Air Force Officer Qualifying Test, overall grade-point average and the rating from an interview.

The majority of scholarships pay full college tuition and most laboratory, textbook and incidental fees, plus a \$100 monthly nontaxable allowance during the school year.

### 326th Air Force ROTC Cadet Group

In order to present a situation for encouraging leadership and Air Force experiences, the cadets of the Air Force ROTC program are organized into a Cadet Group composed of a Cadet Group Commander, the Commander's staff, two squadrons, and four flights. Cadets are issued uniforms and accessories (at no cost)



which are worn on certain days and to Leadership Laboratory.

## Leadership Laboratory

This course is taken every year. You will spend one class period each week putting into practice the leadership skills and management theory acquired in class. Leadership Laboratory is a cadet-centered program that will improve your ability to perform as an Air Force officer. You also will take orientation flights, listen to military speakers, take field trips to military bases, view films and take part in social functions.

## Other Activities

As a cadet in the 326th Air Force ROTC Group, you will have the opportunity to participate in a number of other activities. These include: Arnold Air Society, Silver Wings, the AFROTC Drill Team, air refueling missions on Maine Air National Guard KC-135s, and the Advanced Training Program (AER 435).

## Field Training

Before entering the POC, you will attend Field Training - a four-week summer camp for a four-year cadet and a six-week camp for a two-year cadet. Training is conducted at Air Force bases throughout the country and includes jet trainer flights, survival, small arms marksmanship, career orientation, and leadership training. You will receive pay and allowances authorized at the time of attendance.

## Flight Screening Program

Air Force ROTC pilot candidates who do not possess a civilian or military pilot rating must successfully complete an Air Force ROTC sponsored course of flight screening to remain eligible for Undergraduate Pilot Training after commissioning. Flight screening includes both ground and flight training. The ground training is taught by Air Force personnel and includes topics such as basic aerodynamics, aircraft systems, and emergency procedures. The flight screening syllabus consists of 14 flying hours, including 1 solo flight.

## Professional Officer Course Qualifications

- Be a United States citizen.
- Be a full-time student.
- Be 18 years of age or 17 years with parent or legal guardian consent.
- Be physically qualified.
- Be of good moral character.
- Be in good academic standing.
- Successfully pass the Air Force Officer Qualifying Test.
- Have two academic years remaining.
- Be interviewed and selected by a board of AF officers.
- Complete a 6-week Field Training course if 2-year cadet or a 4-week course if a 4-year cadet.
- Complete all commissioning requirements as follows:
  - pilot/navigator candidate - before age 26 1/2.
  - scholarship recipient - before age 25 as June 30 in eligible year of commissioning.
  - nonscholarship recipient - before age 30.

## General Military Course

The General Military Course (GMC) consists of the first year student and sophomore level courses. The first year of this course may be waived if you have completed the three-year high school junior ROTC program (of any service). Students with prior active or reserve military service also may receive waivers for this portion. In addition to the classroom courses, Leadership Laboratory, AER 125, must be taken each semester by all students in the GMC. You may enroll in any of the GMC courses regardless of whether you plan to pursue a commission as an Air Force officer.

## The Professional Officer Course

The Professional Officer Course (POC) consists of the junior- and senior-level courses designed to complete the professional military education of competitively-selected students preparing for commissioning and entry in the U. S. Air Force upon graduation. In addition to the classroom courses (AER 311/312 and AER 411/412) normally taken sequentially, Leadership Laboratory, AER 325, must be taken by all students in the POC.

## Courses in Aerospace Studies

### **AER 111 Introduction to the Air Force I**

A survey course designed to give a basic overview of the United States Air Force. Examines the missions, organization and operational concepts of the Air Force in relation to the role of U. S. strategic and defensive forces. Covers the concept of officership, the factors which comprise national power, and the basic Air Force organizational structure and doctrine. Includes study of several major air commands.

Cr 1.

### **AER 112 Introduction to the Air Force II**

A survey course designed to give an overview of the United States Armed Forces and the U. S. Air Force in particular (continuation of AER 111). Covers the functions of strategic offensive and defensive forces, general purpose forces, and all related aerospace support forces. Reviews the missions and operations of the Army, Navy, Marine Corps and Coast Guard. Examines factors of U. S. security and compares U. S. Forces with those of potential adversaries. Emphasizes improvements of communications skills.

Cr 1.

### **AER 125 Leadership Laboratory (GMC)**

Mandatory for all cadets enrolled in AER 111/112, 211/212 and members of the 326th Air Force ROTC Group. Meets one hour weekly. (Pass/Fail Grade Only).

Cr 0.

### **AER 211 History Of Military Aviation Through World War II**

A survey study of military aviation in the United States and its development into effective air power, from its earliest days through World War II. Examines the evolution of technology, strategy and tactics. Covers the philosophy and nature of war, especially as it related to present day national security and strategic thinking.

Cr 1.

### **AER 212 History Of Air Power Into The Space Age**

A survey study continuation of AER 211 (recommended to be taken sequentially, but not mandatory). A study of the development of air power from World War II to the present. Particular emphasis is given to the creation of the U. S. Air Force as a separate service and inter-service relationships. Examines the Berlin Airlift, the Korean War, the Vietnam Conflict and recent developments in technology and space and strategic thinking.

Cr 1.

### **AER 251 Introduction To Aviation (Lab)**

A survey course designed to provide insights to aviation and flying as a vocation or avocation. Provides introduction to aerodynamics, aircraft engineering and systems, flight instruments and instrument flying, aviation physiology, meteorology, navigation and Federal Aviation Regulations. Course may not fulfill all requirements for FAA Ground School in time allotted. Meets one afternoon weekly. Spring semester only. Prerequisite: Permission of instructor.

Cr 0.

### **AER 298 Selected Studies in Aerospace Studies**

Topics in Air Force history, organization, doctrine, professionalism, mission, technology, management, and philosophy not covered in other courses. The content may be varied to suit current needs. The course may, with consent of the department, be taken for credit a maximum of three times (maximum of one credit may be used for Humanities credit in the College of Engineering and Science). Prerequisite: permission of the instructor.

Cr 1-3.

### **AER 311 Introduction to Leadership**

The individual as a leader. Study of basic leadership theories and styles. Motivational and behavioral processes with emphasis on individual and group dynamics. Management functions and responsibilities with emphasis on the relationship between leadership and management. Written and spoken communications systems to include development of basic speaking skills. Prerequisite: AER 335 or 345 or permission of instructor.

Cr 3.

### **AER 312 Air Force Management**

A study of management and leadership roles in the Air Force. The managerial process involving decision-making in a dynamic environment. Analysis and discussion of the functions of management. The manager's counseling responsibilities to include military and civilian performance appraisal systems. Power and politics as they relate to the military manager. Organizational and personal value conflicts. The importance of ethics in leadership and management. Prerequisite: AER 335 or 345 or permission of instructor.

Cr 3.

### **AER 325 Leadership Laboratory (POC)**

Mandatory for all students enrolled in the POC and the 326th Air Force ROTC Group. Meets one hour weekly. (Pass/Fail Grade Only).

Cr 0.

**AER 335 Field Training (4-Week Course)****(Lab)**

Summer Field Training encampment of four-weeks duration at selected Air Force bases located throughout the United States. Supplements campus courses in developing leadership and discipline. Mission, organization, and functions of an Air force base; marksmanship, survival, physical training, aircraft orientation, career briefings. Prerequisite: AER 212 and selection for POC entry. Cr 0.

**AER 345 Field Training (6-Week Course)****(Lab)**

Summer field Training encampment as in AER 335, but designed for students in the two-year program who have not participated in the GMC as freshman and sophomores. In addition to the items covered in AER 335, includes two weeks of course work to cover AER 111/112 and AER 211/212. Prerequisite: Selection for POC entry. Cr 0.

**AER 411 National Security Policy Issues**

The political, social and economic constraints on national defense. U. S. civil-military relations and environment in which defense policy is formulated and implemented. DOD planning, budgeting and management, the mechanics of national decision-making processes relative to defense issues. Examination of how the nature of conflict has changed since WW II and problems associated with nuclear capabilities. Emphasis is also placed on the nature of

international alliance building, international peace-keeping forces and conflict and arms control. Provides an understanding of regional issues and how they impact on American national security. Specific regions examined are Soviet Union, East Asia, the Middle East, Sub-Sahara-Africa and Latin America. National Security priorities of the future. Prerequisite: AER 335 or 345 or permission of instructor

Cr 3.

**AER 412 The Professional Officer**

The role of the professional officer in a democratic society; socialization process and value orientation associated with professional military service. Critical examination of the concept of military professionalism by MacArthur, Huntington, Janowitz, Moskos and others. The moral and ethical standards of military professionalism in a changing world. The military justice system as it applies to military members; the Uniform Code of Military Justice, courts-martial, and appellate and review procedures. Prerequisite: AER 335 or 345 or permission of instructor.

Cr 3.

**AER 435 Advanced Training Program (ATP)**

A two-week summer training program for selected senior members of the POC. Conducted at various Air Force bases and includes specialized motivational orientation in an Air force specialty area appropriate to the cadet's category for commissioning.

Cr 0.

## Bio-Resource Engineering

Professors Riley (Chairperson), Klinge, Rhoads, Smith, Rowe; Associate Professors Christensen, Hedstrom, Huff, Soule; Assistant Professor McBurnie

The bio-resource engineering curriculum combines study in engineering and mathematics, the biological sciences, and the physical sciences to provide a unique background for solving engineering problems associated with agriculture, aquaculture, food and fibre processing.

The basic curriculum is strengthened by elective options which permit students to specialize in one of three areas according to their interests and needs. Areas of concentration are: (1) agricultural engineering; (2) aquacultural engineering, and (3) food engineering. Electives in engineering and the life sciences aid in providing a broad base of knowledge for engineering practice.

With the rapidly expanding world population, a rising demand for higher standards of living, and with limited natural resources, bio-

resource engineering graduates are in great demand. Employment opportunities are as diverse as the food and fibre industries themselves. Graduates in bio-resource engineering may be employed as design engineers by machinery and farmstead systems manufacturers; as sales engineers by machinery, food, or chemical companies; as research engineers by industry, government, or state experiment stations; or in teaching or extension positions by universities. Some practice as consulting engineers. An increasing number of opportunities for foreign service are available.

The curriculum in bio-resource engineering is a joint responsibility of the College of Engineering and Science and the College of Applied Sciences and Agriculture and is accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology.

This degree requires satisfactory completion of at least 131 degree hours at an accumulative grade point average of not less than 2.0.

### Specimen Curriculum

Freshman Year			
First Semester		Second Semester	
AEN 220 Principles of Mechanization	3	AEN 255 Materials in Agricultural Engineering	3
FAA 117 Issues and Opportunities	1	AEN 257 Computer Applications in Agricultural and Forest Engineering	3
GEE 101 Introduction to Engineering Design	3	MAT 127 Analytic Geometry and Calculus	4
MAT 126 Analytical Geometry and Calculus	4	PHY 122 Physics for Engineers and Physical Scientists II	4
PHY 121 Physics for Engineers and Physical Scientists I	4	Elective	3
<b>TOTAL HOURS</b>	<b>15</b>	<b>TOTAL HOURS</b>	<b>17</b>

### Curriculum in Bio-Resource Engineering

Bio-Resource Engineering			
AEN 220 Principles of Mechanization	3	Surveying	1
AEN 255 Materials in Agricultural Engineering	3	AEN 282 Introduction to Agricultural Engineering	2
AEN 257 Computer Applications in Agricultural Engineering	3	AEN 460 Agricultural Machinery	3
AEN 268 Computer Aided Drafting & Design	3	AEN 463 Farm Structures Design	3
AEN 281 Elementary Plane		AEN 464 Instrumentation and Control Systems	3
		AEN 465 Soil and Water Engineering	3

AEN 467 Agricultural Power	3	AEN 491 Design Project I	1
AEN 469 Agricultural Processing Engineering	3	AEN 492 Design Project II	2
AEN 380 Senior Seminar	1	AEN 493 Design Project III	1
		MINIMUM HOURS	<u>38</u>

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Basic Engineering

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GEE 101 Introduction to Engineering Design	3	ELE 215 Electrical Circuit Fundamentals	<u>3</u>
MEE 150 Applied Mechanics: Statics	3	MINIMUM HOURS	<u>24</u>
MEE 230 Thermodynamics	3	Technical Electives A group of engineering or science courses selected by the student and approved by the advisor.	
MEE 251 Strength of Materials	3	MINIMUM HOURS	<u>9</u>
MEE 270 Applied Mechanics: Dynamics	3		
MEE 360 Fluid Mechanics	3		
MEE 380 Design I	3		

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Basic Sciences and Mathematics

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CHY 113 Chemical Principles	4	MAT 127 Analytic Geometry and Calculus	4
PHY 121 Physics for Engineers and Physical Scientists I	4	MAT 228 Analytical Geometry and Calculus	4
PHY 122 Physics for Engineers and Physical Scientists II	4	MAT 259 Differential Equations	<u>4</u>
MAT 126 Analytical Geometry and Calculus	4	MINIMUM HOURS	<u>28</u>

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Agricultural and Biological Science

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BIO 100 Basic Biology	4	MINIMUM HOURS	<u>10</u>
PSS 140 Soil Science	3		
Electives	3		

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Humanities, Social Sciences, and Communications

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(To include at least 16 credit hours of Humanities and Social Sciences)		MINIMUM HOURS	<u>21</u>
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Other

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FAA 117 Issues and Opportunities	1		
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MINIMUM HOURS REQUIRED FOR GRADUATION: 131

Students transferring to the University of Maine under the Regional Program from the Universities of Massachusetts, New Hampshire, Rhode Island, or Vermont after the sophomore year should check the bulletins of those institutions for curricula for the first two years in Agricultural Engineering.

### Graduate Work in Bio-Resource Engineering

The degrees of Master of Science (Bio-Resource Engineering) and Master of Engineering (Bio-

Resource Engineering) are offered with options for specialization in soil and water engineering, farm structures, agricultural power and machinery, electric power and processing, and aquacultural systems.

Several research assistantships are available each year. Incumbents devote half time to research work on approved projects of the Agricultural Experiment Station.

## Chemical Engineering Including Pulp and Paper Technology

Professors Kraske (Chairperson), Ceckler, Chase (Emeritus), Genco (Calder Professor of Pulp and Paper Engineering and Science), Hassler, Kiran (Gottesman Research Professor of Chemical Engineering, and Graduate Coordinator), Mumme (Undergraduate Coordinator), Stockel, Thompson (University of Maine Pulp and Paper Foundation Professor of Chemical Engineering); Associate Professors Co, Hill (on leave), Hwalek, Pendse (University of Maine Pulp and Paper Foundation Faculty Fellow); Assistant Professors Bousfield, Lisius, Woerner; Adjunct Professor Robbins, Faculty Associate Marshall

Chemical engineers are primarily concerned with designing, operating and managing processing systems to alter and upgrade products and materials so that they are more useful for mankind, and to do so with the greatest possible economy and the least possible harm to the environment. The basic chemical engineering curriculum provides the educational breadth and depth necessary to prepare students to perform these important roles in society.

Student candidates for the B. S. degree in Chemical Engineering are prepared for satisfying and challenging careers involving design, operation, and improvement of chemical processes, materials, and products in the chemical and related industries. A chemical engineering education is an excellent component of training for a professional career that leads to management. The broad educational background prepares students for careers in other areas; chemical engineers are active in improving the environment, planning for utilization of resources, food production, health services, and systems analysis. Chemical engineering training provides a unique background for solving problems, especially those involving physical and/or chemical changes in materials that arise in these areas.

The curriculum provides a broad background in the fundamentals of science and engineering. Opportunities are afforded for application of these fundamentals to typical chemical engineering problems to illustrate how comprehensive problems are analyzed and solved. The curriculum also provides the student an opportunity to select a specialized

area and develop skills needed to work more effectively in that area. A background in the humanities and social sciences is provided so that the graduate can understand our society and make decisions which contribute to its development and improvement.

The study of chemistry, physics, and mathematics which are the foundations of engineering, begins in the first year of the chemical engineering curriculum. Courses in organic and physical chemistry provide the extensive knowledge of chemistry required in the education of chemical engineers and in the practice of chemical engineering. Basic knowledge of electricity and mechanics is essential and is provided by courses in the appropriate departments. Applications-oriented chemical engineering courses begin during the freshman year so that students may gain an early understanding of the significance of their major field.

Students are assisted by faculty counselors in developing an elective program in the humanities and social sciences to satisfy their individual interests within the general college requirements. In addition, the department requires that the humanities and social studies program contains one nine-hour course sequence in a single subject.

During the latter part of the student's academic training, the student must select an area of engineering within which he or she will receive more specialized technical education (technical electives option). The technical electives option requires a minimum of nine hours. A faculty counselor will assist each student in selecting an appropriate option and in scheduling specific courses to meet this requirement. Technical elective options have been defined in process control, polymer engineering, and pulp and paper engineering. Other special options may be approved upon petition to the department.

The four-year curriculum leads to the degree of Bachelor of Science in Chemical Engineering, which is fully accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology. Although the curriculum provides excellent preparation for an effective professional career, superior students can elect to take additional courses; they are encouraged to do so during the latter stages of their academic training.

## Pulp and Paper Technology Program

Manufacture of pulp and paper products from wood and other fiber resources is one of the largest industries in the United States and the world. It depends in a major way upon chemical engineering for research, design, and management of a wide range of both organic and inorganic chemical processes in complex and integrated systems. The Department of Chemical Engineering at the University of Maine pioneered the first program to study pulp and paper engineering in the United States, and continues to provide instruction in the multidisciplinary application of engineering sciences to the varied and complex operations of this forest resources industry. The modern and extensive paper industry of this state provides an exceptional opportunity for cooperative interaction of university-based programs with real life problems of industrial operations and development. Students with a special interest in this industry, and whose commitment to the full curriculum for the B. S. degree in Chemical Engineering is subordinate to other goals, can elect a four-year educational program leading to the degree of Bachelor of Science in Pulp and Paper Technology. This curriculum is process-engineering oriented. Specialized courses designed for work specifically in this industry are substituted for some of the science and engineering courses that are required in chemical engineering.

### Advanced Study in Pulp and Paper Management

Students with a B. S. degree can program a fifth-year extension of their undergraduate curriculum to fulfill requirements for a *Certificate of Advanced Study in Pulp and Paper Management*. One half of the fifth year covers basic fiber science and the engineering technology of pulp and paper production. The other half can be an elective sequence to develop special interests in process engineering, systems engineering, environmental engineering, applied computer sciences, polymer science, process control, plant design, operations economics, engineering management, business administration, and others. Students at the University of Maine who are enrolled in a B. S. degree program can undertake an integrated program where the requirements of the fourth year of their basic curriculum and the additional courses of the five-year option are distributed to reinforce each other over the last two years of a five-year

program. The B. S. degree and the certificate are awarded concurrently at the end of the fifth year. Requirements for a *Certificate of Advanced Study in Pulp and Paper Management* include the successful completion of a minimum of 30 credit hours beyond the B. S. degree requirements. These hours must include the courses: PPA 365, PPA 366, PPA 473, PPA 474, PPA 695 and PPA 696 unless written permission is obtained from the faculty advisor. PPA 499 may be substituted for PPA 473 or PPA 474 but not for both. The remaining credits are to be taken in courses that constitute a minor field and are usually taken from the College of Arts & Sciences, the College of Business Administration, the College of Engineering and Science, and the College of Forest Resources. They are selected to enhance the career preparation of the student. A variety of elective course programs can be developed to meet individual needs of the student in consultation with and with approval of the faculty advisors so that requirements for a *Certificate of Advanced Study in Pulp and Paper Management* can be completed within one academic year beyond the B. S. degree. The certificate program may be taken concurrently with some M. S. programs with consent of the academic organizations involved. However the certificate program is a fifth-year extension of studies at the undergraduate level in those courses which are required, and courses taken for this certificate will not satisfy degree requirements for an M. S. program unless prior permission by the student's graduate advisory committee has been obtained.

### Cooperative "Work-Experience" Program Option in Chemical Engineering

Students with satisfactory academic standing at the conclusion of their fourth semester in the B. S. curriculum of chemical engineering or pulp and paper technology may petition for and accept opportunities provided by cooperating companies to undertake the special "Co-op" program. This involves work as a chemical engineering intern for two periods of supervised and paid professional experience. These periods alternate with two regular terms of study over a continuous 15-month period, which normally begins in June of the sophomore year and ends in September immediately before the fall semester of the senior year. While college credit is granted for this program, the credits cannot be used as substitutes for courses required in the curriculum for the B. S. degree.

These credits are in addition to the minimum required for the B. S. degree. Students in the "Co-op" program can complete their study program to graduate with a B. S. degree at the same time as do other members of their class. Students should consult with the chairperson or faculty advisors of the Department of Chemical Engineering for additional details. "Co-op" program positions are awarded on a competitive basis, with collective consent of the faculty, the selected student, and the industrial "Co-op" employer. Students who complete the requirements of the "Co-op" program are awarded a Certificate of Chemical Engineering Internship together with their B. S. degree.

### Graduate Work in Chemical Engineering

The Department offers M. S. and Ph. D. degree programs. Students with a B.S. in chemical engineering are required to complete 30 semester hours of graduate work, including a thesis, two seminars, and six courses to receive

an M. S. in chemical engineering. The Ph. D. degree requires a minimum of 60 semester hours of graduate work beyond an M. S. in chemical engineering; these requirements are accounted for by a dissertation, four seminars, and six graduate courses. In addition to completing the course and research requirements, Ph. D. students are required to take a qualifying examination and a research examination on their plan of dissertation. Highly qualified and motivated graduates with a B. S. in a discipline other than chemical engineering may be admitted to the M. S. program. They are required to take selected undergraduate chemical engineering courses in addition to the required graduate work. Details for the requirements for the degree of Master of Science in Chemical Engineering and Doctor of Philosophy in Chemical Engineering are given in the Bulletin of the Graduate School of the University of Maine, and can be obtained from the Graduate School or the Department of Chemical Engineering. Fellowships and assistantships are available to graduate students.

## Specimen Curriculum for the Degree of Bachelor of Science in Chemical Engineering

### Freshman Year

First Semester		Second Semester	
MAT 126 Analytic Geometry and Calculus	4	MAT 127 Analytic Geometry and Calculus	4
CHY 113 Chemical Principles I	4	CHY 114 Chemical Principles II	4
PHY 121 Physics for Engineers and Physical Scientists I	4	PHY 122 Physics for Engineers and Physical Scientists II	4
CHE 111 Introduction to Chemical Engineering	2	CHE 112 Introduction to Chemical Engineering II	2
Humanities/Social Sciences Elective*	3	Humanities/Social Sciences Elective*	3
<b>TOTAL HOURS</b>	<b>17</b>	<b>TOTAL HOURS</b>	<b>17</b>

### Sophomore Year

First Semester		Second Semester	
MAT 228 Analytic Geometry and Calculus	4	MAT 258 Introduction to Differential Equations and Linear Algebra	4
CHY 251 Organic Chemistry Lecture I	3	CHY 252 Organic Chemistry Lecture II	3
CHY 253 Organic Chemistry Laboratory I	2	ELE 215 Electric Circuit Fundamentals	3
CHE 200 Fundamentals of Chemical Engineering	4	CHE 385 Chemical Engineering Thermodynamics I	3
Humanities/Social Sciences Elective	3	MAT 332 Statistics for Engineers	3
<b>TOTAL HOURS</b>	<b>16</b>	Humanities/Social Sciences Elective	3
		<b>TOTAL HOURS</b>	<b>19</b>



Junior Year			
First Semester		Second Semester	
CHY 371 Physical Chemistry I	4	CHY 372 Physical Chemistry II	4
CHE 360 Elements of Chemical Engineering I	4	CHE 362 Elements of Chemical Engineering II	4
CHE 352 Process Control	3	CHE 361 Chemical Engineering Laboratory I	2
CHE 386 Chemical Engineering Thermodynamics II	3	CHE 368 Chemical Engineering Kinetics	3
CHE 330 Engineering Materials	3	Technical Elective I	3
<b>TOTAL HOURS</b>	<b>17</b>	<b>TOTAL HOURS</b>	<b>16</b>

Senior Year			
First Semester		Second Semester	
MEE 252 Statics and Strength of Materials	3	CHE 479 Process Design Projects	4
CHE 477 Elements of Chemical Process Design	3	CHE 493 Chemical Engineering Seminar	1
CHE 493 Chemical Engineering Seminar	0	Technical Elective III	3
CHE 363 Chemical Engineering Laboratory II	2	Humanities/Social Sciences Elective	3
Technical Elective II	3	Humanities/Social Sciences Elective	3
Humanities/Social Sciences Elective	3	<b>TOTAL HOURS</b>	<b>14</b>
<b>TOTAL HOURS</b>	<b>14</b>	<b>TOTAL DEGREE HOURS: 130</b>	
		*One must be ENG 101 or equivalent.	

### Specimen Curriculum for the Bachelor of Science in Pulp and Paper Technology

Freshman Year			
First Semester		Second Semester	
MAT 126 Analytic Geometry and Calculus	4	MAT 127 Analytic Geometry and Calculus	4
CHY 113 Chemical Principles I	4	CHY 114 Chemical Principles II	4
PHY 121 Physics for Engineers and Physical Scientists I	4	PHY 122 Physics for Engineers and Physical Scientists II	4
CHE 111 Introduction to Chemical Engineering	2	CHE 112 Introduction to Chemical Engineering II	2
Humanities/Social Sciences Elective (1)	3	Humanities/Social Sciences Elective (1)	3
<b>TOTAL HOURS</b>	<b>17</b>	<b>TOTAL HOURS</b>	<b>17</b>

Sophomore Year			
First Semester		Second Semester	
MAT 228 Analytic Geometry and Calculus	4	MAT 258 Introduction to Differential Equations and Linear Algebra	4
CHE 200 Fundamentals of Chemical Engineering	4	MEE 231 Thermodynamics II (2)	3
MEE 230 Thermodynamics I (2)	3	ELE 215 Electric Circuit Fundamentals	3
CHY 251 Organic Chemistry Lecture I	3	CHY 252 Organic Chemistry Lecture II	3
CHY 253 Organic Chemistry Laboratory I	2	MAT 332 Statistics for Engineers	3
<b>TOTAL HOURS</b>	<b>16</b>	<b>TOTAL HOURS</b>	<b>16</b>

Junior Year			
First Semester		Second Semester	
CHE 360 Elements of Chemical Engineering I	4	CHE 362 Elements of Chemical Engineering II	4
PPA 365 Pulp Technology	3	PPA 366 Paper Technology	3
CHY 371 Physical Chemistry I	4	CHY 455 The Chemistry of Cellulose and Wood (3)	3
BOT 203 The Plant Kingdom	4	WTY 416 Wood Anatomy	4
Humanities/Social Sciences Elective	3	Humanities/Social Sciences Elective	3
<b>TOTAL HOURS</b>	<b>18</b>	<b>TOTAL HOURS</b>	<b>17</b>
Senior Year			
First Semester		Second Semester	
CHE 352 Process Control	3	PPA 474 Paper Manufacture and Testing	4
PPA 473 Pulp Manufacture and Testing	4	MEE 251 Strength of Materials	3
CHE 330 Engineering Materials	3	Humanities/Social Sciences Elective	3
MEE 150 Applied Mechanics: Statics	3	Humanities/Social Sciences Elective	3
Humanities/Social Services Elective	3	Technical Elective	3
<b>TOTAL HOURS</b>	<b>16</b>	<b>TOTAL HOURS</b>	<b>16</b>
		<b>TOTAL DEGREE HOURS: 133</b>	

**NOTES:**

1. One must be ENG 101 or equivalent
2. CHE 385 and CHE 386 may be substituted for MEE 230 and MEE 231.
3. CHY 240 Quantitative Analysis may be substituted for CHY 455.

## Courses in Chemical Engineering

### CHE 111 Introduction to Chemical Engineering

Introductory topics fundamental to beginning chemical engineering studies. Topics and problems are selected to provide a basis for further study in chemical engineering. FORTRAN programming and applications. Admission: freshman and sophomore only. Rec 2. **Cr 2.**

### CHE 112 Introduction to Chemical Engineering II

Continuation of CHE 111. Rec 2. **Cr 2.**

### CHE 200 Fundamentals of Chemical Engineering

The application of the principles of material and energy balances to the solution of problems in chemical engineering operations and processes through quantitative correlation of basic concepts of chemistry, physics, and mathematics. Prerequisite: CHY 114 or permission. Lec 4. **Cr 4.**

### CHE 330 Engineering Materials

Relationships between structure of matter and functional properties of engineering materials; application of principles to material selection for design, emphasizing principles of materials resistance and costs. Prerequisites: CHE 385. Corequisite: CHE 386 or permission. Lec 3.

**Cr 3.**

### CHE 350 Elements and Applications of the Theory of Automatic Control

Introductory survey of the theory of automatic control systems. Operational techniques to support laboratory practice in application of theory to some specific examples of industrial process control systems. Not available to Chemical Engineering majors. Prerequisites: MAT 259. Rec 2, Lab 2. **Cr 3.**

### CHE 352 Process Control

Process dynamics described by ordinary differential equations and by linearized approximations. Solution of system equations by the use of Laplace transforms. Concepts of feedback control, process dynamics and closed loop sys-

tem analysis. Prerequisites: MAT 259 or permission. Rec 3. Cr 3.

### **CHE 360 Elements of Chemical Engineering I**

Introduction to rate operations, stage operations, and the principles of molecular and turbulent transport of mass, momentum, and energy. Application of these principles to the chemical engineering unit operations. Prerequisite: CHE 200. Rec 4. Cr 4.

### **CHE 361 Chemical Engineering Laboratory I**

Application of the principles of the unit operations and process control in the laboratory, using pilot scale equipment. Emphasis is placed upon formal reports. Prerequisite: CHE 352, 360. Lab 4. Cr 2.

### **CHE 362 Elements of Chemical Engineering II**

Introduction to rate operations, stage operations, and the principles of molecular and turbulent transport of mass, momentum, and energy. Application of these principles to the chemical engineering unit operations. Prerequisite: CHE 200, 360. Rec 4. Cr 4.

### **CHE 363 Chemical Engineering Laboratory II**

Application of the principles of the unit operations and process control in the laboratory, using pilot scale equipment. Emphasis is placed upon formal reports. Prerequisites: CHE 352, CHE 362. Lab 4. Cr 2.

### **CHE 368 Chemical Engineering Kinetics**

A study of the rates and mechanisms of ordinary and catalyzed reactions with the view of providing the data for process design. Co-requisite: CHY 372. Rec 3. Cr 3.

### **CHE 385 Chemical Engineering Thermodynamics I**

Applications of the first and second laws of thermodynamics to the analysis of systems of interest to chemical engineers. Topics include the state equations for both ideal and real gases, the heat and energy relationships in chemical reactions, elementary phase equilibria, and simple heat and power cycles. Prerequisite: CHE 200. Rec 3. Cr 3.

### **CHE 386 Chemical Engineering Thermodynamics II**

Continuation of Thermodynamics I. Emphasis given to homogeneous mixtures, multi-component vapor-liquid equilibria, chemical reaction equilibria and the thermodynamic analysis of

chemical processes. Prerequisite: CHE 385. Rec 3. Cr 3.

### **CHE 431 Polymer Chemistry and Reactions**

Synthesis and production of polymeric materials from monomers or by modification of natural polymers. Various polymerization reactions, their catalysis and their mechanisms and kinetics are considered as well as industrial systems used for polymerization. Prerequisite: CHY 252. Corequisite: CHY 372. Lec 3. Cr 3.

### **CHE 432 Polymer Structure and Properties**

Structure and properties of polymeric materials. Polymer structure and morphology, transitional phenomena, crystallinity, solution behavior, characterization, and basis rheology and properties related to chain structure are studied. Prerequisite: CHY 372. Corequisite: CHE 386 or permission. Lec 3. Cr 3.

### **CHE 433 Introduction to Polymer Processing**

The application of engineering principles to polymer processing with particular emphasis on applied rheology, extruder design, die design, spinning, molding, and sheet fabrication. Mathematical modelling of processes and the effects of processing on the products formed emphasized. Prerequisites: CHE 431, 362, 386, CHY 372 or permission. Lec 3. Cr 3.

### **CHE 454 Introduction to Digital Computer Process Control**

Real-time process programming concepts. The z transformation and design of digital controllers using Nyquist and Root Locus methods. Laboratory control project. Prerequisites: CHE 352. Lec 3. Cr 3.

### **CHE 456 Advanced Process Control I**

Examination of dynamic systems in state variable form. State variable models, interaction and decoupling, controllability and observability. Multivariable systems. Prerequisite: CHE 352 or permission. Lec 3. Cr 3.

### **CHE 458 Advanced Process Control II**

Principles and methods of parameter estimation, system identification, and search techniques. Advanced process controller and control law design. Stochastic systems. Includes applications and examination of current literature. Prerequisites (or concurrent registration): CHE 454, CHE 456 or permission. Lec 3. Cr 3.

### **CHE 477 Elements of Chemical Process Design**

Introduction to chemical process design and

engineering economics. Consideration of general principles of design, complex process flow diagrams, heat and material balances, rate equations, and cost estimating techniques. Principles of engineering economics involving time value of money, taxes, depreciation, profitability indicators, alternative investment and optimization. Prerequisite: Senior standing. Rec 3. Cr 3.

#### **CHE 479 Process Design Projects**

Application of chemical engineering principles to the solution of complex, open-ended, design problems. Problems involving feasibility, analysis, design and optimization of chemical processes. Review of methods for estimating thermodynamic and transport properties required in process design. Emphasis will be placed on oral and written communications and working in small design groups. Prerequisite: CHE 477. Rec 1, Lab 3. Cr 4.

#### **CHE 493 Chemical Engineering Seminar**

Discussion of recent developments in chemical engineering and related fields. Prerequisite: senior chemical engineering standing. Cr 0-1.

#### **CHE 494 Chemical Engineering Practice**

A cooperative work experience in some commercial operation of the chemical process industry. Prerequisite: permission. May be taken more than once until a total of 8 credit hours is accumulated. (Pass/Fail Grade Only). Cr Ar.

#### **CHE 497 Independent Study**

Individual and independent study of a specialized topic under staff supervision. Program of study to be designed for each topic individually, with reporting required. Prerequisite: permission. Accumulative credit hours to be 3 or less. Cr Ar.

#### **CHE 498 Special Topics in Chemical Engineering**

Selected subjects in the field of chemical engineering, or related areas of science and technology, not covered in other courses. May be taken more than once. Prerequisite: permission. Cr 3.

#### **CHE 499 Undergraduate Thesis**

Original investigation of a chemical engineering problem, and reporting of the results. accumulative credit hours for 2 or more semesters is 3-6. Cr Ar.

#### **CHE 520 Colloid Technology**

Chemical and physical factors underlying interfacial phenomena developed and applied.

Includes thermodynamics of absorption, surface tension, capillarity, wetting and spreading, electrical properties of interfaces, electrokinetics, surfactant, aerosols, emulsions, foams. Cr 3.

#### **CHE 521 Intermediate Chemical Engineering Thermodynamics**

Phase and reaction equilibria in multi-component, non-ideal, and complex systems. Flow and non-flow systems. Application of general thermodynamic methods to problems in chemical engineering. Cr 3.

#### **CHE 522 Chemical Engineering Plant Design**

Advanced study in plant design. Student works on an individual basis. Cr 3.

#### **CHE 523 Economic Balance**

Problem course, emphasizing quantitative evaluation of various factors in design and control of chemical plant equipment. Most economic operation of equipment stressed. Cr 3.

#### **CHE 530 Introduction to Polymer Science**

Research techniques for synthesis and modification of organic and inorganic macromolecules; analytical methods to relate molecular and phase structure with solubility, transport and interfacial properties. Cr 3.

#### **CHE 531 Advanced Chemical Engineering Kinetics**

Theory of homophase and heterophase catalysis. Chemical transformation as a base for process design. Includes chain reactions, acid-base catalysis, enzymes, and commercial case studies such as hydrocarbon synthesis, organic oxidations, cracking, and platforming. Cr 3.

#### **CHE 542 Advanced Process Dynamics and Control**

Analysis and design of digital computer based process control systems, using Z-transform theory and state variable methods. Process identification methods. Dynamics and stability of closed loop systems. Cr 3.

#### **CHE 552 Special Problems in Computer Programming and Systems**

Application to real process using interrupts and direct digital control in a real-time environment. Experimental optimization and search techniques, principles, applications of various system identification techniques. Cr 3.

#### **CHE 553 Special Problems in Computer Programming and Systems II**

Analysis Digital, analog, and hybrid comput-

ers for process control. Application to real process using interrupts and direct digital control in a real-time environment. Experimental optimization and search techniques, principles, applications of various system identification techniques. **Cr 3.**

#### **CHE 560 Heat Transfer**

Phenomenon of heat transfer in conventional settings. Information on transfer of mass, momentum, and heat from phase boundaries to flowing fluids applied to the design and prediction of the performance of heat transfer devices under both steady-state and transient conditions. **Cr 3.**

#### **CHE 562 Mass Transfer**

Application of engineering science and mathematical techniques to study comprehensive problems of mass transfer in chemical engineering operations. Non-isothermal and unsteady-state systems. Development of physical models of mass transfer processes. **Cr 3.**

#### **CHE 570 Chemical Engineering of Pulp and Paper Manufacture**

Advanced course in operations of importance in the manufacture of pulp and paper; e. g., flow of fluids, heat transfer, absorption, evaporation, drying. **Cr 3.**

#### **CHE 580 Chemical Engineering Analysis**

Modeling and simulation of chemical engineering processes. Emphasis is on the formation of a model using ordinary and partial differential equations, and on the solution of the model using numerical methods. **Cr 3.**

#### **CHE 594 Chemical Engineering Practice**

Individual or group investigation of the operation of commercial processes or practices in industrial situations. **Cr Ar.**

#### **CHE 598 Special Topics in Chemical Engineering**

Special topics presented as need and interest require. Topics will include studies relevant to fields of application, such as pulp and paper, polymers, process control, materials conversion, and surface properties. Prerequisite: permission. **Cr Ar.**

### **Courses in Pulp and Paper Technology**

#### **PPA 264 Survey of the Paper Industry**

Introductory overview of the structure and technology of the U. S. pulp and paper in-

dustry. Suitable for non-technical students. The manufacture of paper is considered starting with fibrous raw materials and concluding with the processing of finished products. Emphasis on papers produced from wood, non-wood, and secondary fibers. Rec 3. **Cr 3.**

#### **PPA 365 Pulp Technology**

The chemical and engineering principles of manufacturing various wood pulps. Prerequisite: Junior standing, CHE 200, or permission. Rec 3. **Cr 3.**

#### **PPA 366 Paper Technology**

The chemical and engineering principles of paper manufacturing from the preparation of fiber furnishes to the final stage of drying. Prerequisite: CHE 200 or permission. Rec 3. **Cr 3.**

#### **PPA 473 Pulp Manufacture and Testing**

A problem-oriented laboratory course involving the process design criteria for the production of mechanical, semi-chemical and chemical wood pulps. Prerequisite: PPA 365 (may be taken concurrently). Lab 8. **Cr 4.**

#### **PPA 474 Paper Manufacture and Testing**

A problem-oriented laboratory course involving the process design of paper making and finishing systems. Prerequisite: PPA 366 (may be taken concurrently). Lab 8. **Cr 4.**

#### **PPA 475 Mathematical Modeling of Pulp and Paper Systems**

A lecture and recitation course giving an introduction to the use of computer modeling in the analysis and design of the equipment and processes involved in the manufacture of pulp and paper. Prerequisite: MAT 259 or equivalent. Rec 3. **Cr 3.**

#### **PPA 499 Undergraduate Thesis**

Original investigation of a pulp and paper problem and reporting of the results. Prerequisite: permission. **Cr Ar.**

#### **PPA 573 Design Practices in the Pulp and Paper Industry I**

Problem oriented laboratory course on analysis and design of products and processes related to manufacture of pulp, paper, and chemical by-products. PPA 573 is concerned with extraction of pulp or other chemicals from wood, while PPA 574 emphasizes conversion of pulp and other silvichemical intermediates into useful consumer products. Prerequisites: (may be taken concurrently) PPA 365, PPA 366. Rec 1, Lab 5. **Cr 3.**

**PPA 574 Design Practices in the Pulp and Paper Industry II**

Problem oriented laboratory course on analysis and design of products and processes related to manufacture of pulp, paper, and chemical by-products. PPA 573 is concerned with extraction of pulp or other chemicals from wood, while PPA 574 emphasizes conversion of pulp and other silvichemical intermediates into useful consumer products. Prerequisites: (may be taken concurrently) PPA 365, 366. Rec 1. **Cr 3.**

**Interdisciplinary Courses****INT 233 (CHE) Introduction to Engineering**

Lecture sessions are on computer programming (FORTRAN), pulp and paper processes,

and an engineering problem of current topical interest such as energy or ecology. Small group laboratory projects deal with various topics of interest, typically chosen from ecology and environment, pulp and paper processes, analytical instrumentation, energy, materials science, and computer programming and applications. Admission by permission only. **Cr 3.**

**INT 398 (CHE, CHY, ELE) Undergraduate Research Participation**

Research topics to be chosen by the students in consultation with faculty members in the departments and programs in the College of Engineering and Science. Students are required to submit a final report describing their research and present an oral seminar. **Cr 1-3.**



# Civil Engineering

Professors Alexander (Chairperson), Brutsaert, Elgaaly, Greenwood, Nightingale, Pearce; Associate Professors Lowry, Rock, Sandford; Assistant Professors Dagher, Humphrey, Panchang, Spirakos; Faculty Associates Hamilton, Wardwell, Woodard;

## Undergraduate Programs

The Civil Engineering Department offers a four-year undergraduate program leading to the bachelor of science degree in civil engineering .

Civil engineers are primarily responsible for planning, designing, and constructing facilities to serve society. They design and construct highways and railroads, bridges and tunnels, airports and harbors, hydroelectric dams and power plants, irrigation and flood control projects, and the foundations and frames of buildings. Civil engineers also plan and design water purification plants, pollution control facilities, and other environmental protection projects.

A civil engineer may specialize in one or several of these areas and may further specialize in a particular function, such as design or management. Consequently, the curriculum

provides a broad-based program stressing the fundamentals common to the many branches of civil engineering. This curriculum is designed to provide the student with a well-founded civil engineering education while allowing the student the option of selecting electives in one or more disciplines such as environmental, geotechnical, structures, transportation, water resources, construction, and coastal engineering. Course work also is provided in the humanities and social sciences to give the student a broader view of cultural, political, and economic aspects of society and their relationship to engineering.

The program is accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology.

## Graduate Programs

The Department of Civil Engineering offers programs of study and research leading to the M. S. , M. E. , and Ph. D. degrees in Civil Engineering. Descriptions of the programs and general requirements for advanced degrees are described in the Graduate School catalog.

## Civil Engineering Curriculum

Freshman Year			
First Semester		Second Semester	
CIE 110 Materials	4	ENG 101 College Composition	3
MAT 126 Analytic Geometry and Calculus	4	GEE 101 Introduction to Engineering Design	3
PHY 121 Physics for Engineers and Physical Scientists I	4	MAT 127 Analytic Geometry and Calculus	4
Humanities/Social Sciences Elective (1)	3	MEE 150 Applied Mechanics: Statics	3
<b>TOTAL HOURS</b>	<b>15</b>	PHY 122 Physics for Engineers and Physical Scientists II	4
		<b>TOTAL HOURS</b>	<b>17</b>

Sophomore Year			
First Semester		Second Semester	
COS 215 Introduction to Computing Using FORTRAN	3	COS 305 Numerical Methods with FORTRAN	3
SVE 111 Plane Surveying	3	MEE 251 Strength of Materials	3
CHY 113 Chemical Principles I	4	MAT 258 Introduction to Differential Equations and Linear Algebra	4
CIE 225 Transportation Engineering	3	Basic Sciences Elective (2)	4
MAT 228 Analytic Geometry and Calculus	4	Humanities/Social Sciences Elective	3
<b>TOTAL HOURS</b>	<b>17</b>	<b>TOTAL HOURS</b>	<b>17</b>

Junior Year			
First Semester		Second Semester	
CIE 331 Fundamentals of Environmental Engineering	3	CIE 365 Soil Mechanics	3
CIE 340 Introduction to Structures	4	CIE 366 Soil Mechanics Laboratory	1
CIE 350 Hydraulics	4	ENG 317 Advanced Professional Exposition	3
MAT 332 Statistics for Engineers	3	Civil Engineering Elective (3)	3
Humanities/Social Sciences Elective	3	Civil Engineering Elective	3
<b>TOTAL HOURS</b>	<b>17</b>	Humanities/Social Science Elective	3
		<b>TOTAL HOURS</b>	<b>16</b>
Senior Year			
First Semester		Second Semester	
Civil Engineering Elective	3	CIE 411 Engineering Project Management	3
Civil Engineering Elective	3	CIE 412 Engineering Decisions	3
Engineering Science Elective (4)	3	Technical Elective	3
Technical Elective (5)	3	Engineering Science Elective	3
Humanities/Social Sciences Elective	3	Humanities/Social Sciences Elective	3
Free Elective(6)	3	<b>TOTAL HOURS</b>	<b>15</b>
<b>TOTAL HOURS</b>	<b>18</b>	<b>TOTAL CREDIT HOURS: 132</b>	

Electives: Elective courses are used to meet part of the EAC-ABET accreditation requirements for basic science, engineering science, engineering design, and humanities/social sciences as listed in the general college requirements, above. Students are assisted by faculty advisers in developing an elective program to meet the accreditation requirements, and the students' individual needs.

1. It is required that the humanities/social science portion of the program contain at least one nine-hour sequence in a specific subject, and that the sequence include at least two upper level courses. A total of 18 credits of approved humanities/social sciences electives are required.
2. Four credits of approved basic science electives in geology, chemistry, physics, or life sciences are required.
3. A minimum of 15 credit hours of Civil Engineering electives are required for graduation. At least nine elective credit hours must be in design.
4. Six credits of approved engineering science electives, usually in mechanical or electrical engineering, are required.
5. Technical electives are advanced-level engineering, science, or mathematics courses. A minimum of 18 credits must be taken in Civil Engineering courses and technical electives. It is strongly recommended that students take a second course in three of the four areas (construction/transportation, environmental, geotechnical, structures) to ensure the breadth required by most civil engineers.
6. The free elective is either a technical or non-technical course offered for credit by an academic unit of the University. (Remedial courses are excluded.)

## Courses in Civil Engineering

### CIE 110 Materials

The structure, properties, and testing of engineering materials and their use in constructed facilities. Topics include: metals, woods, concrete, bituminous mixtures, plastics, insulation, adhesives and corrosion of materials. Students are exposed to the design process by addressing material selection problems and by designing concrete mixes and insulating systems for various design situations. The design exercises involve consideration of economic, safety and

aesthetic factors, as well as technical factors.  
Lec 3, Lab 2. **Cr 4.**

### CIE 225 Transportation Engineering

An introduction to the broad field of transportation with emphasis on the motor vehicle mode. Principles of roadway and urban transportation planning, economic analysis methods, and route design elements are discussed and related to the planning and design of highway transportation routes. Course includes a major student project involving design of the horizontal and vertical alignment,



drainage, and pavement structure and safety features for a section of roadway. Civil Engineering majors or permission. Corequisite: SVE 111. Lec 3. Cr 3.

#### **CIE 294 Civil Engineering Practice**

Work experience in civil engineering. May be taken more than once. Prerequisite: sophomore standing. Cr 1-3.

#### **CIE 331 Fundamentals of Environmental Engineering**

Introduction to environmental engineering including water quality, water and wastewater treatment plant design, solid and hazardous wastes, landfill design, radioactive waste control, and air pollution abatement. Prerequisite: CHY 113. Lec 3. Cr 3.

#### **CIE 340 Introduction to Structures**

The cyclic process of analysis and design. Structure idealization and modeling. Design methodologies and loads considerations. Building codes and specifications. The analysis of determinate trusses, beams and frames. Introduction to indeterminate structures and the use of personal computers in structural computations. Prerequisite: MEE 251. Lec 3, Lab 3. Cr 4.

#### **CIE 350 Hydraulics**

An elementary course presenting fundamental principles of fluid flow and their applications to engineering problems. Includes study of hydrostatics, liquid measuring devices, and channel and pipe flow. Prerequisite: MEE 150. Lec 3, Lab 2. Cr 4.

#### **CIE 365 Soil Mechanics**

An introduction of the fundamental physical properties, engineering behavior and performance of soils and rocks. Prerequisite: MEE 251, COS 215. Lec 3. Cr 3.

#### **CIE 366 Soil Mechanics Laboratory**

Geotechnical laboratory testing includes classification, density, permeability, shear strength, and consolidation tests. Design project reports are also submitted to ENG 317. Corequisite: CIE 365, ENG 317. Lab 2. Cr 1.

#### **CIE 411 Engineering Project Management**

CPM, PERT and basic principles of management are presented within the overall framework of project design to include the planning, scheduling and control of engineering work. Prerequisite: senior standing or permission. Lec 3. Cr 3.

#### **CIE 412 Engineering Decisions**

Application of various analysis methods to en-

gineering design decisions. Evaluation of economic, financial, legal, and ethical factors that affect engineering design. Topics include: engineering economy, consideration of risk and uncertainty, and evaluation of ambiguous and intangible factors in engineering design. Senior standing or permission. Lec 3. Cr 3.

#### **CIE 426 Advanced Roadway Design**

Design of roadway pavement structures with wearing surfaces ranging from surface treatments through heavy duty bituminous or portland cement mixes, design of roadway drainage needs and earth movement schemes, geometric design of at-grade intersections and introduction to pavement management systems. Prerequisite: CIE 225. Lec 3. Cr 3.

#### **CIE 432 Water Supply Engineering Design**

Theory and design of water supply, treatment facilities, and distribution systems. Design projects cover design and economics of pipeline, pumping station, and distribution system. Computer software applications in all areas. Laboratory for design group meetings and development of process data for treatment process design. Prerequisite: CIE 331, CIE 350. Lec 2, Lab 3. Cr 3.

#### **CIE 433 Environmental Engineering Chemistry**

Fundamental aspects of chemistry emphasizing environmental engineering applications. Laboratory methods for the analysis of water and wastewater. Prerequisite: CIE 331. Lec 2, Lab 3. Cr 3.

#### **CIE 434 Wastewater Engineering Design**

Theory and design of wastewater collection, treatment, and disposal. Design project covers development of a facility plan, sewer design, process design, and sludge disposal. Prerequisite: CIE 331, CIE 350. Lec 2, Lab 3. Cr 3.

#### **CIE 440 Structural Analysis I**

Classical and matrix methods in the analysis of linear redundant systems. The basic concepts of equilibrium, stress-strain relations, and compatibility are emphasized. Manual and introductory computer aided solution techniques are utilized. Prerequisite: CIE 340. Lec 3, Lab 3. Cr 4.

#### **CIE 442 Reinforced Concrete Design**

The design and detailing of reinforced concrete structures: beams, columns, beam-columns, slabs, footings, retaining walls. Microcomputer aided design project. Prerequisite: CIE 340. Lec 3, Lab 3. Cr 4.

**CIE 443 Structural Steel Design**

The design and detailing of steel structures. Tension members, beams, columns, beam columns, and connections. Composite construction and introduction to the Load and Resistance Factor Design concept. Introduction to computer aided design. Prerequisite: CIE 340. Lec 3, Lab 3. **Cr 4.**

**CIE 444 Design of Wood Structures**

Lumber mechanical properties and design stresses; vertical and lateral load transfer in wood buildings: structural glulam; design of beams, columns, and beam-columns both solid and laminated; trusses; plywood and other structural panels; plywood lumber beams; horizontal diaphragms; shear walls; connections and connection hardware; curved beams, arches and domes; wood bridges. Microcomputer-aided design project. Prerequisite: CIE 340 or WTY 425. Lec 3, Lab 3. **Cr 4.**

**CIE 445 Building Design**

The conceptual, preliminary and final design of a building project. Economic, engineering, and sociopolitical constraints are considered. Owner, architect, engineer, and contractor relationships are explored. Course is professional in nature, utilizing the active involvement of practicing architects, engineers, planners, and contractors. Prerequisite: CIE 440 and one structural design course. Lec 2, Lab 3. **Cr 3.**

**CIE 455 Hydrology**

Application of statistical analysis to rainfall and runoff processes for the development of design parameters of water resources projects, including discussion of aspects of uncertainty of these parameters. The collection and presentation of factors affecting rainfall and runoff data. Methods for developing hydrographs and flood control. Development of design hydrographs for urbanizing watersheds (conditions of change). Prerequisite: CIE 350. Lec 3. **Cr 3.**

**CIE 456 Groundwater Hydrology and Hydraulics**

Fundamentals of the hydromechanics of flow through porous media, and the development and application of methodology for solving the many open-ended problems of groundwater flow, supply and pollution. Concepts of groundwater modelling design. Aspects of field variability and uncertainty. Prerequisite: CIE 350 and MAT 258 or MAT 259 or permission. Lec 3. **Cr 3.**

**CIE 458 Coastal Engineering**

Principles of fluid mechanics and coastal hydraulics are applied to civil engineering problems in coastal areas. Linear wave theory. Wave transformation in coastal areas (shoaling, refraction, diffraction). Wave forecasting. Sediment transport. Wave forces on pilings and walls. Design of rubble mound structures. Case study of coastal engineering project. Project work to include estimation of wave heights in a coastal area and providing design and cost for a breakwater. Prerequisite: CIE 350. Lec 3. **Cr 3.**

**CIE 460 Geotechnical Engineering**

The application of geotechnical engineering to practical engineering design and construction problems. Economic and safety constraints are considered in design decisions. Prerequisite: CIE 365. Lec 3. **Cr 3.**

**CIE 470 Construction Management and Estimating**

Management of construction activity with emphasis on cost estimating and bid preparation. Topics include: construction business management, advertising and contracting process, construction plans and specifications, quantity take-off, unit costs, and bid proposals. Prerequisite: CIE 110, 225. Lec 2, Lab 3. **Cr 3.**

**CIE 473 Construction Equipment and Methods**

The equipment and methods used in heavy and highway construction. Topics include: organizational and legal framework in U. S. construction practice, basic physical and economic principles governing the efficiency of construction practice, and selection of types and combinations of equipment for heavy and highway construction operations. Prerequisite: CIE 470 or permission. Lec 2, Lab 3. **Cr 3.**

**CIE 498 Selected Studies in Civil Engineering**

Topics in civil engineering not regularly covered in other courses. The content can be varied to suit current needs. The course may, with consent of the department, be taken more than once. Prerequisite: permission of the department. **Cr 1-3.**

**CIE 499 Undergraduate Thesis**

The study and reporting of some original investigation or design. Time to be arranged. Prerequisite: permission. **Cr 2-3.**

**CIE 539 Water Quality**

The effects of organic, nutrient, toxic, and ther-

mal pollutants on water quality in streams, lakes, reservoirs, and estuaries. Application of water quality standards. Prerequisite: CIE 331, CIE 433 or concurrent. Lec 3. Cr 3.

#### **CIE 540 Structural Analysis II**

Microcomputer based analysis of linearly elastic trusses, frames, beams and grids. Limit analysis of continuous beams and frames. Sub-structuring. Review of selected commercial structural analysis software packages. Techniques for verifying computer generated results. Prerequisite: CIE 440. Cr 3.

#### **CIE 541 Finite Element Analysis of Structures**

Review of matrix analysis of structures. Preliminary topics in elasticity and energy principles. The finite element concept. Plane stress and strain analysis, axisymmetric solids and flat shells of revolution, three dimensional solids, plate bending and flat shell elements. Isoparametric elements, natural coordinates and numerical integration. Application and introduction to computer programs. Prerequisites: CIE 444 or MEE 456. Lec 3. Cr 3.

#### **CIE 545 Structural Dynamics**

Free vibration and response to harmonic and general dynamic loading of the single degree of freedom system. Fourier analysis and response in the frequency domain. Response spectra. Framed structures modeled as discrete multi-degree-of-freedom systems. Dynamic analysis of systems with distributed properties. Introduction to seismic design, machine foundations and structural dynamics computer programs. Prerequisite: CIE 440. Cr 3.

#### **CIE 546 Probabilistic Methods in Structural and Geotechnical Engineering**

Uncertainties in structural and geotechnical engineering; review of probability theory; probabilistic models for load and resistance variables; fundamentals of reliability theory; Monte-Carlo simulations and numerical integration techniques; introduction to the reliability of structural systems; introduction to time-dependent reliability; load combinations; applications to code development. Prerequisite: MAT 330 and one 400-level design course and CIE 365. Cr 3.

#### **CIE 556 Advanced Groundwater Hydrology and Modelling**

Advanced topics of the groundwater system

and flow through porous media pertaining to the modelling of fluid flow and mass transport in the groundwater environment. Prerequisite: CIE 456 or equivalent. Cr 3.

#### **CIE 557 Water Resources Engineering**

Development, control, and engineering of water resources systems. Emphasis on basin-wide and regional analyses. Introduction to systems engineering techniques applied to water resources problems. Prerequisite: CIE 455 or permission. Lec 3. Cr 3.

#### **CIE 558 Advanced Coastal Engineering**

The principles of hydraulics will be applied to civil engineering problems in lakes and coastal areas. Topics include: wave forecasting, shoaling, refraction, sediment transport, stability of rubble mound structures and design of coastal structures. Emphasis on analysis and development of material not covered in CIE 458. Prerequisite: MAT 258 or MAT 259. Lec 3. Cr 3.

#### **CIE 559 Numerical Modeling of Lake and Estuarine Processes**

Using various numerical models as case studies, strategies for environmental modeling are discussed. Emphasis placed on calculation of flows and on transport of water-borne material and pollutants. Topics include the relative validity of different numerical formulations as well as considerations of stability, economy, and accuracy. An important consideration, model verification using field data is discussed along with measurement techniques. Prerequisite: MAT 258 or MAT 259. Lec 3. Cr 3.

#### **CIE 562 Earthwork Design**

Design and construction of earth structures including earth dams, landfill liners and roadway embankments. Economic, safety, reliability, ethics, social impact, and legal constraints are considered in design decisions. Prerequisite: CIE 365. Lec 3. Cr 3.

#### **CIE 563 Thermal Soil Mechanics**

The thermal properties of soils, heat transfer, and methods to predict soil temperature under freezing conditions. Design of pavements, foundations, and excavations to resist the effects of freezing. Prerequisite: CIE 365. Cr 2.

#### **CIE 564 Deep Foundations**

The theories, design concepts, and construction of pile and caisson foundations for buildings and bridges. Economic, safety, and reliability constraints are considered in design decisions. Corequisite: CIE 460. Cr 3.

**CIE 565 Foundations and Underground Structures**

Design of shallow foundations for buildings and bridges. Effect of economics and reliability on choice of foundation system. Design of dewatering systems, buried pipes, and tunnels. Legal and ethical aspects of geotechnical practice. Intended for structural and soils students. Corequisite: CIE 460. Cr 3.

**CIE 566 Retaining Earth Structures**

Geotechnical analysis and design for structures which retain earth. Economic, safety and reliability constraints are considered in design decisions. Prerequisite: CIE 460. Cr 3.

**CIE 567 Ground Improvement Techniques**

Practical techniques to overcome unfavorable ground conditions applied to foundation, roadway, and embankment design. Compaction, in-situ densification, stone columns, chemical stabilization, reinforced embank-

ments, preloading, sand drains, and wick drains. Prerequisite: CIE 460. Cr 3.

**CIE 592 Civil Engineering Seminar I**

Individual oral presentation and discussion of current research and topics of civil engineering interest. Required of all civil engineering graduate students. Cr 1.

**CIE 593 Civil Engineering Seminar II**

Individual oral presentation and discussion of current research and topics of civil engineering interest. Required of all civil engineering graduate students. Cr 1.

**CIE 598 Selected Studies in Civil Engineering**

Advanced topics in Civil Engineering not regularly covered in other courses. Content varies to suit individual needs. Courses may, with the permission of the department, be taken more than once. Prerequisite: permission. Cr 1-3.



## Electrical Engineering Including Computer Engineering

Professor Field (Chairperson) Libbey, Peake, Sheppard, Turner, Vetelino, Wuorinen, Assoc. Prof. Musavi; Assistant Professors Christianson, Hanselman, McKenny, ; Visiting Professor Lec; Lecturers Beenfeldt, Whitney; Adjunct Professors McAllister, Webb

### Computer Engineering

The Computer Engineering Program provides its graduates with the knowledge necessary to design systems based on computers and complex digital logic devices. These systems find use in such diverse tasks as computation, communication, entertainment, information processing, artificial intelligence and control. There are many career opportunities in the public and private sectors for persons with a background in Computer Engineering. Some of these opportunities are in computer-aided design, computer-aided manufacturing as well as developing hardware and software for computer-based systems.

A computer engineer must know how to select and interconnect the electronic and mechanical devices which make up a computer-based system. This is the kind of work usually associated with electrical engineering. However, the computer engineer must also be capable of developing the software that makes a computer system perform its task. He or she might need to know, for example, which programming language is best for a particular need or what is the most efficient way to store or process data. This area is normally associated with computer science. Thus, a computer engineer must be proficient with computer science material as well as electrical engineering material.

The curriculum also provides a knowledge of basic sciences, mathematics and electrical engineering as well as public speaking, social studies, humanities and English. The choice of technical elective courses is based on individual interest and presently allow specialization in areas like Computer Aided Design, Digital Control, Communications, Robotics and Computer Graphics.

A cooperative work program is available for those students who wish to include relevant industrial experience in their curriculum. In addition, opportunities exist for students to enhance their practical experience by working with faculty on projects and assisting with laboratory instruction.

### Academic Policies for Computer Engineering

The Computer Engineering Program is divided into lower and upper divisions. The lower consists of the courses normally taken in the first four semesters while the upper consists of those courses taken in the last four semesters. A lower division student may, with permission, take up to 9 credit hours of upper division courses. However, a lower division student may not take an upper division course having another upper division course as a prerequisite. To graduate, a student must meet the University requirements, Computer Engineering Curriculum requirements, and also have a GPA of 1.8 in upper division ELE and COS courses without benefit of lineout. A course may not be repeated more than once without the Dean's approval. No admission into ELE 210 with more than one D\* grade in required freshman Mathematics and Physics courses. No admission into any ELE or COS course unless all prerequisites have been satisfied. A student may be admitted to the upper division of the Computer Engineering program upon:

1. Completing the lower division courses with a GPA of 2.0 or better without accumulating more than 3 course repeats. and
2. Obtaining grades of C- or better in each of the lower division required ELE and COS courses.

A student may be recommended for discontinuance because of any of the following indications of unsatisfactory progress.

1. Failure to be admitted to the upper division.
2. Two failures in any single course in the program.
3. Two successive semesters with a GPA less than 2.0 in ELE and COS courses. \*D-, D or D+

## Computer Engineering Curriculum

Freshman Year			
First Semester		Second Semester	
CHY 113 Chemical Principles	4	MAT 127 Analytic Geometry and Calculus	4
MAT 126 Analytic Geometry and Calculus	4	PHY 122 Physics for Engineers and Physical Scientists II	4
PHY 121 Physics for Engineers and Physical Scientists I	4	COS220 Introduction to Computer Science I	3
ELE 172 Logic Systems	4	ELE 171 Microcomputer Architecture and Applications	4
<b>TOTAL HOURS</b>	<b>16</b>	ENG 101* College Composition	3
		<b>TOTAL HOURS</b>	<b>18</b>

Sophomore Year			
First Semester		Second Semester	
MAT 228 Analytic Geometry and Calculus	4	MAT 259 Differential Equations	4
ELE 210 Network Fundamentals I	4	ELE 211 Electrical Networks II	3
COS 221 Introduction to Computer Science II	3	ELE 212 Electrical Networks Laboratory	3
SPC 103 Fundamentals of Public Communications	3	ELE 262 Physical Electronics	3
Humanities Elective**	3	COS 250 Discrete Structures	3
<b>TOTAL HOURS</b>	<b>17</b>	<b>TOTAL HOURS</b>	<b>16</b>

Junior Year			
First Semester		Second Semester	
COS 301 Programming Languages	3	ELE 400 Design Project	1
ELE 314 Linear Circuits and Systems	3	ELE 475 Sequential Logic Systems	3
ELE 342 Electronics I	4	ENG 317 Advanced Professional Exposition	3
ELE 471 Microcomputer Applications Engineering	3	COS 331 Operating Systems	3
Humanities Elective	3	Humanities Elective**	3
<b>TOTAL HOURS</b>	<b>16</b>	Technical Elective	3
		<b>TOTAL HOURS</b>	<b>16</b>

Senior Year			
First Semester		Second Semester	
ELE 400 Design Project	4	ELE 400 Design Project	2
MAT 332 Statistics for Engineers Basic Science	3	Humanities Elective**	3
Humanities Elective**	4	Humanities Elective**	3
Technical Elective	3	Technical Elective	3
<b>TOTAL HOURS</b>	<b>17</b>	Technical Elective	3
		<b>TOTAL HOURS</b>	<b>17</b>

TOTAL HOURS TO GRADUATE 133

\*ENG 101 is a prerequisite for ENG 317. Certain students may meet this prerequisite by examination.

\*\*A list of courses qualifying for humanities credit is available in the EE office. At least 2 humanities and/or social science electives must be courses which have, as prerequisites, introductory courses in the appropriate area.

## Electrical Engineering

The electrical engineering curriculum is designed to provide students with the relevant skills and the basic scientific background needed to advance today's technology and to keep abreast of future developments in the electrical engineering profession. The program is accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology.

The early part of the program emphasizes electrical engineering skills which form the background for the upper level elective and design courses. The required and elective electrical engineering courses are supplemented with basic courses in physics, chemistry, basic science, mathematics, computer science and mechanical engineering, while 18 credit hours of humanities electives allow students to expand their cultural and intellectual horizons. Technical electives can be chosen in the junior and senior years when students' individual interests have had a chance to develop.

Two important features of the electrical engineering curriculum are the ELE 300 seminar series and the ELE 400 project courses. The junior ELE 300 seminar furnishes career orientation and professional values at a time when it is most appropriate and is designed to make students aware of electrical engineering activities and opportunities. The ELE 400 project course occurs during the last three semesters of the program and allows students to demonstrate engineering abilities by proposing, completing, and reporting on detailed design projects.

Students who desire engineering experience in industry or government laboratories can apply for the department's co-op program where individuals can work on current engineering problems; those who are more research-oriented can request the opportunity of working closely with individual faculty members in their areas of interest.

### Academic Policies for Electrical Engineering

The Electrical Engineering program is divided into two divisions, lower and upper. The lower will consist of the courses normally taken in the first four semesters of the Electrical Engineering Program while the upper will consist of those courses taken in the last four semesters.

A lower division student may, with permission, take up to 9 credit hours of upper division

ELE courses. However, a lower division student may not take an upper division course having another upper division course as a prerequisite.

To graduate a student must meet the University requirements, obtain admission to the upper division, meet the Electrical Engineering Curriculum requirements, and also have a GPA of 1.8 in upper division ELE courses without benefit of lineout.

A course may not be repeated more than once without the Dean's approval.

No admission into ELE 210 with more than one D\* grade in required freshman math and physics courses.

No admission into any ELE course unless all prerequisites have been satisfied.

A student must meet the following basic requirements before being considered for admission to the upper division of the Electrical Engineering program.

1. GPA of 2.0 or better without accumulating more than three course repeats, and
2. After lineouts, have no more than one D\* grade in all required lower division courses.

A student may be recommended for discontinuance because of any of the following indications of unsatisfactory progress.

1. Failure to be admitted to the upper division.
2. Two failures in any single course in the program.
3. Two successive semesters with a GPA less than 2.0 in ELE courses.

The above policy applies to those students who are pursuing a BSEE degree. Deviations from this policy require approval of the Electrical Engineering Faculty.

### Graduate Work in Electrical Engineering

Programs leading to the degree of Master of Science in Electrical Engineering and Master of Engineering (Electrical) are described in the University of Maine at Orono Graduate School Catalog.

### Double Major: Electrical and Mechanical Engineering

A student who earns a BSEE can earn a BSME by taking the additional courses: GEE 101, MEE 230, 231, 251, 270, 340, 341, 360, 380, 432, 442,

\* "D grade" includes D+, D, or D-

481. Several of these can also satisfy technical elective requirements in the electrical engineering curriculum. An appropriate design project in ELE 400 can satisfy MEE 387 and MEE 388.

A student who earns a BSME can earn a BSEE by taking the additional courses: ELE 171, 172, 211, 212, 262, 314, 323, 342, 343, 351, 383, 400 and the mathematics elective. ELE 212 can be used to replace ELE 224 in the mechanical engineering curriculum. In addition, any

two of the courses ELE 323, ELE 342, ELE 343, or ELE 351 can be used to satisfy the Group 2, Engineering Science, elective requirements in the mechanical engineering curriculum. An appropriate design project in ELE 400 can satisfy MEE 387 and MEE 388.

A minimum of one extra year will be required for the double major regardless of whether the basic degree is in electrical or mechanical engineering.

### Electrical Engineering Curriculum

#### Freshman Year

Freshman Year		Freshman Year	
First Semester		Second Semester	
CHY 113 Chemical Principles I	4	MAT 127 Analytic Geometry and Calculus	4
MAT 126 Analytic Geometry and Calculus	4	PHY 122 Physics for Engineers and Physical Scientists II	4
PHY 121 Physics for Engineers and Physical Scientists I	4	COS 220 Introduction to Computer Science I	3
ELE 172 Logic Systems	4	ELE 171 Microcomputer Architecture and Applications	4
<b>TOTAL HOURS</b>	<b>16</b>	ENG 101 *College Composition	3
		<b>TOTAL HOURS</b>	<b>18</b>

\*ENG 101 is a prerequisite for ENG 317. Certain students may meet this prerequisite by examination.

#### Sophomore Year

First Semester		Second Semester	
MAT 228 Analytic Geometry and Calculus	4	MAT 259 Differential Equations	4
ELE 210 Electrical Networks I	4	ELE 211 Electrical Networks II	3
Engineering Science Elective (5)	3	ELE 212 Electrical Networks Laboratory	3
Humanities Elective (1)	3	Engineering Science Elective (5)	3
Basic Science (2)	4	ELE 262 Physical Electronics	3
<b>TOTAL HOURS</b>	<b>18</b>	<b>TOTAL HOURS</b>	<b>16</b>

#### Junior Year

First Semester		Second Semester	
ELE 300 Seminar	1	ELE 400 (Division 01) Electrical Engineering Design Project	1
ELE 314 Linear Circuits and Systems	3	ELE 323 Energy Transmission and Conversion	4
ELE 342 Electronics I	4	ELE 343 Electronics II	4
ELE 351 Fields and Waves	3	ELE 383 Communication Engineering	3
Humanities Elective (1)	3	ENG 317 Advanced Professional Exposition	3
Math Elective (3)	3	Humanities Elective (1)	3
<b>TOTAL HOURS</b>	<b>17</b>	<b>TOTAL HOURS</b>	<b>18</b>



## Senior Year

First Semester		Second Semester	
ELE 400 (Division 02) Electrical Engineering Design Project	4	ELE 400 (Division 03) Electrical Engineering Design Project	2
SPC 103 Fundamentals of Public Communications	3	Technical Elective (4)	3
Technical Elective (4)	3	Technical Elective (4)	3
Technical Elective (4)	3	Humanities Elective (1)	3
Humanities Elective (1)	3	Humanities Elective (1)	3
<b>TOTAL HOURS</b>	<b>16</b>	<b>TOTAL HOURS</b>	<b>14</b>

TOTAL HOURS TO GRADUATE: 133

## Electives:

1. A list of courses qualifying for humanities credit is available in the electrical engineering office.
2. Suggested basic science courses include CHY 114, PHY 236, or BIO 100 (four hours required).
3. A list of courses qualifying for the math elective credit is available in the electrical engineering office.
4. Technical electives must include three courses within the electrical engineering department. Other electives can be chosen from engineering departments, physics, chemistry, math, and computer sciences. Technical electives must include at least four hours of engineering design.
5. A list of courses qualifying for engineering science elective credit is available in the electrical engineering office.

## Courses in Electrical Engineering

**ELE 171 Microcomputer Architecture and Applications**

The microcomputer and its component parts including microprocessors, registers, memory and I/O. Programming and applying the microcomputer in engineering systems. Rec 3, Lab 3. 1 Design Cr. **Cr 4.**

**ELE 172 Logic Systems**

Introduction to the design of logic systems; combinatorial and sequential logic: use of SSI and MSI in design of logic systems. Lec 3, Lab 3. 2 Design Cr. **Cr 4.**

**ELE 210 Electrical Networks I**

Basic circuit laws and theorems, natural and forced responses of first and second order systems, phasor concepts, application of basic circuit theorems to steady-state a-c networks. Characteristics and proper use of basic circuit instruments. Introduction of the PC as a network analysis tool. Prerequisite: MAT 127, PHY 122. Lec 3, Lab/Comp 3. **Cr 4.**

**ELE 211 Electrical Networks II**

Steady-state power concepts, analysis of poly-phase circuits and magnetically coupled circuits, frequency domain analysis, network representation using two-port parameters, Fourier series applications. Prerequisite: MAT 228, ELE 210; also ELE 212 concurrently or permission. Lec 3. **Cr 3.**

**ELE 212 Electrical Networks Laboratory**

Tools and techniques of electrical measurements, computer analysis of electrical networks, op-amp applications, verification and clarification of concepts developed in ELE 210/211. Corequisite: ELE 211. Lec 2, Lab 3.

**Cr 3.****ELE 215 Electric Circuit Fundamentals**

A basic course in electrical circuits, covering direct and alternating circuits, first order transients, three phase circuits, operational amplifiers. Prerequisites: PHY 122, MAT 127. Not open to Electrical Engineering majors. Lec 3.

**Cr 3.****ELE 224 Instrumentation**

Application and characteristics of electronic instrumentation including the oscilloscope and digital indicators; sensitivity and frequency limitations; meters and bridges; instrumentation systems. Prerequisites: ELE 210 or ELE 215. Lec 3, Lab 3. 1 Design Cr. **Cr 4.**

**ELE 262 Solid State Electronic Devices**

Basic characteristics of materials of importance in device applications. Introduction to the theory of pn junctions, bipolar and field effect transistors. Prerequisites: CHY 113, PHY 122. Corequisite: MAT 259. Lec 3. **Cr 3.**

**ELE 300 Seminar**

Exploration of career opportunities, organizational structure of industry and professional responsibilities. Prerequisite: Junior standing. Lec 1. (Pass/Fail Grade Only). **Cr 1.**

**ELE 314 Linear Circuits and Systems**

Analysis of continuous and discrete linear systems. Fourier series, Fourier transforms, and Laplace transform techniques. Convolution, transfer functions and state variable system representations. Discrete Fourier transform and Z-transform techniques. Prerequisites: MAT 259, ELE 211, COS 220. Lec 3. Cr 3.

**ELE 323 Energy Transmission and Conversion**

Basic concepts related to electrical power system, power system components and measurements. Prerequisite: ELE 211 or ELE 212. Lec 3, Lab 3. 1 Design Cr. Cr 4.

**ELE 342 Electronics I**

Fundamentals of digital electronic devices and circuits; diodes, FET's, BJT's, monolithic IC fabrication, LSI Fundamentals, design of logic gates and families, combinational and sequential logic circuits. Prerequisites: ELE 211, ELE 262. Lec 3, Lab 3. 1 Design Cr. Cr 4.

**ELE 343 Electronics II**

Fundamentals of analog electronic circuits and systems; design of analog semiconductor circuits, amplifiers, frequency response, op amp characteristics and applications feedback. Prerequisite: ELE 342. Lec 3, Lab 3. 1 Design Cr. Cr 4.

**ELE 351 Fields and Waves**

Static electric and magnetic fields; field mapping; properties of dielectric and ferromagnetic materials; time varying fields, Faraday's law, Maxwell's equations; plane waves in dielectric and conducting media; calculation of the fields and other properties of common transmission lines. Prerequisite: MAT 259, PHY 122. Lec 3. 5 Design Cr. Cr 3.

**ELE 383 Communications Engineering**

Basic principles of modern communication engineering; methods of analysis; modulation techniques; effects of noise; information transmission. Prerequisite: MAT 259, ELE 314. Lec 3. Cr 3.

**ELE 394 Electrical Engineering Practice**

Work experience in electrical engineering. May be taken more than once. Prerequisite: sophomore standing and permission. (Pass/Fail Grade Only). Cr. 1-3.

**ELE 400 Electrical Engineering Design Project**

Proposal, implementation and reporting on a device or system to perform an engineering function. To be accomplished by a single stu-

dent or group of students. The course is divided into three semesters. Semester A: Lectures on researching the project, feasibility studies, report and proposal writing, oral presentations. Major emphasis will be on the project proposal. Semester B: Implementation of the design project. This will usually consist of independent laboratory work to build and test the proposed device or system. Semester C: Written and oral presentation and documentation. In the normal sequence, this course is taken in the second semester of the junior year and the two semesters of the senior year. Prerequisite: Must have passed three of the following four courses: ELE 314, ELE 342, ELE 351, ELE 471. Sem. A=1 Cr. ; Sem. B=4 Cr. ; Sem. C=2 Cr. 7 Design Cr. Total Cr 7.

**ELE 414 Feedback Control Systems**

Analysis and design of continuous and discrete control systems using transfer function and state variable system representations. Signal flow graphs and Mason's gain formula. Decomposition of transfer functions. Controllability and observability. Root locus techniques. Routh-Hurwitz criterion. Nyquist criterion. Controller design in time and frequency domains, State feedback, phase lead and lag controllers, PID type controllers. Occasional laboratory experimentation. Prerequisite: ELE 314, basic knowledge of matrix algebra. Lec 3. (2 Design Cr.). Cr 3.

**ELE 415 Digital Image Processing**

Introduction to optical and computer image processing techniques and their applications. The physics of images and sensors, image digitizer organization and computer communication. Image generation, sampling and quantization. Thresholding, binary images, gray level images, pseudo-color, coding techniques. Image processing mathematics, two dimensional discrete Fourier transform, convolution and correlation, image transforms. Masking, image smoothing, image sharpening, highpass and lowpass filters, histogram, image enhancement. Use of image processing facilities and laboratory. Prerequisite: COS 215 or COS 220 and ELE 314 or equivalent. Basic knowledge of matrix algebra is required. Lec 2, Lab 3. 1. 5 Design Cr. Cr 3.

**ELE 417 Introduction to Robotics**

An introduction to the basic concepts of robotics and operation of microcomputer-controlled manipulators with their applications in automation. The following topics will be discussed: a general review of robot structure, current ap-

plication of robots in automation, spatial descriptions and coordinate transformations, manipulator kinematics and solutions, robot control and path planning, dynamics, vision in robot application. Prerequisite: COS 215 or COS 220; MAT 228; knowledge of matrix algebra and some familiarity with basic control and rigid body mechanics suggested. Lec 2, Lab 3. 1.5 Design Cr. Cr 3.

#### **ELE 425 Control Devices and Systems**

Characteristics of power electronic devices, control of heating, dc motor control systems, adjustable frequency drives for three phase motors, effect of harmonics on system performance, computer stimulation of electromechanical systems. Prerequisite: ELE 323 or permission. Lec 3. 1 Design Cr. Cr 3.

#### **ELE 427 Electric Power Transmission**

Line constants per unit quantities, symmetrical components and study of power system faults, power transformers, transmission line parameters, and load flow studies. Prerequisite: ELE 323. Lec 2, Lab 3. 1 Design Cr. Cr 3.

#### **ELE 428 Electric Power Systems**

Power system control and stability, power flow, AC/DC power lines, analysis of faulted power systems, relaying. Lec 2, Lab 3. Prerequisite: ELE 427. Cr 3.

#### **ELE 436 Electro-acoustics**

Acoustic wave specifications and levels; human ear physiology and protection; electro-mechanical and acoustical lumped circuits; electro-mechano-acoustic systems of microphones and loudspeakers; fundamentals of architectural acoustics; acceptable noise standards and criteria; instrumentation; Lec 3 with several laboratory periods substituted for equivalent class time. Prerequisites: Senior or graduate standing. 1.5 Design Cr. Cr 3.

#### **ELE 437 Environmental Noise Control**

Sound energy propagating in porous acoustical materials, in solid structures; basic design of mufflers and vibration isolation; air handling system noise control, sound energy propagating outdoors, transportation vehicular noise; statistical specification of industrial and urban noise; rudiments of community noise control. Prerequisite: ELE 436. Lec 3. 3 Design Cr. Cr 3.

#### **ELE 441 Micro-Electronics Filter Theory and Design**

Design of inductorless electric filter stressed, standard forms of lowpass, bandpass, high-pass, and bandstop realized with op-amps; applications include data and voice commu-

nication systems in modern micro-electronic engineering. Prerequisite: ELE 210 and ELE 211. Lec 3. 3 Design Cr. Cr 3.

#### **ELE 444 Analog Integrated Circuits**

Topics in the internal circuit design and system applications of analog integrated circuits; current sources, differential amplifiers, level shifters, op amps, regulators, high frequency considerations; digital-to-analog and analog to digital converters, phase-locked loops. Prerequisite: ELE 314 and ELE 343. Lec 3. 2 Design Cr. Cr 3.

#### **ELE 453 Microwave Engineering**

High-frequency transmission lines, impedance matching, graphical methods, microwave circuits, measurement techniques, microwave components, rectangular and cylindrical waveguides, antennas. Prerequisite: ELE 351. 1 Design Cr. Cr 3.

#### **ELE 463 Solid State Electronic Devices II**

Introduction to the theory of selected devices including pnpn structures and optoelectronic devices. Device characterization, device design. Prerequisites: ELE 262. Lec 3 with an occasional laboratory period substituted for equivalent class time. Cr 3.

#### **ELE 464 Microelectronics**

Fabrication topics, process design. Prerequisite: ELE 463. Lec 3 with an occasional laboratory period substituted for equivalent class time. 2 Design Cr. Cr 3.

#### **ELE 471 Microprocessor Applications Engineering**

Application of micro-processors to the solution of design problems, including hardware characteristics, peripheral control techniques and system development. Prerequisites: ELE 171, 172. Lec 2, Lab 3. 2 Design Cr. Cr 3.

#### **ELE 475 Sequential Logic Systems**

Methods of design and test for logic systems with memory. Sequential machine flow charting and algorithmic approaches to design. Test procedures and the design of system tests. Prerequisite: ELE 172. Lec 3. 2 Design Cr. Cr 3.

#### **ELE 484 Communications Engineering II**

Digital communication systems, multiplexing, signal space, information theory and coding. Prerequisite: ELE 383. Lec 3. Cr 3.

#### **ELE 486 Digital Signal Processing**

The basic principles of processing signals in discrete form. Review of z-transforms, discrete Fourier series and transforms. Flow graph and

matrix representations of digital filters, digital filter design techniques and fast Fourier transforms. Emphasis is placed on using the computer to both design and realize various signal processors. Prerequisites: COS 220 and ELE 383. Lec 3. 1. 5 Design Cr. **Cr 3.**

#### **ELE 498 Selected Topics in Electrical Engineering**

Topics in electrical engineering not regularly covered in other courses. Topics recently covered in this course include advanced microprocessor applications, robot applications, instrumentation semiconductor technology, introduction to VLSI design and microwave acoustics. The content can be varied to suit current needs. The course may, with permission of the department, be taken more than once. Prerequisite: Permission of the department.

**Cr 1-3.**

#### **ELE 512 Linear Systems Analysis**

Analysis of linear dynamic systems using matrices and linear vector spaces, internal and external models, state variable analysis, controllability and observability, stability. Prerequisites: ELE 314, MAT 262. **Cr 3.**

#### **ELE 514 Modern Control Systems**

Analysis and design of continuous and discrete control systems. State variable, linear algebraic, and quantitative feedback design; tracking and disturbance rejection; optimal, robust and adaptive control; application to motion control. Prerequisite: ELE 512. **Cr 3.**

#### **ELE 521 High Voltage Engineering**

High voltage generation and measurement techniques, field distribution, stress control, electrical breakdown of gases, solids, and liquids. Other topics covered include circuit breakers, surge arresters, lightning phenomena, and system insulation design. Prerequisite: ELE 323 or equivalent; EE seniors with permission. Lec 3. **Cr 3.**

#### **ELE 523 Mathematical Methods in Electrical Engineering**

Application of advanced mathematical methods to problems in electrical engineering. Topics include conformal mapping, calculus of variations, and difference equations. Prerequisite: ELE 512 or permission. Lec 3. **Cr 3.**

#### **ELE 533 Advanced Robotics**

The intelligent robot control system and programming will be introduced. Robot dynamical equations, path planning and trajectory generation, control system, off-line simulations, robot languages, and vision integration

in robot applications will be discussed. Prerequisite: ELE 417. Lec 2, Lab 3. **Cr 3.**

#### **ELE 535 Computer Vision**

An introduction to computer vision and perception. Image generation, the physics of images and sensors, binary images, image processing and understanding, computational methods for recovery and representation of visual information, a general review of available vision systems and their applications in automation. Prerequisite: COS 215 or COS 220, and ELE 314 or equivalent. Lec 2, Lab 3. **Cr 3.**

#### **ELE 550 Electromagnetic Theory**

Review of Maxwell's Equations and waves in dielectric and lossy media; Image Theory, Induction Theorem and Green's Functions; plane cylindrical and spherical wave functions; radiation and antennas; rectangular, cylindrical and spherical waveguides and cavities; perturbational and variational techniques. Prerequisite: ELE 351 or equivalent. Lec 3.

**Cr 3.**

#### **ELE 552 Wave Propagation**

Theory of propagation of electromagnetic waves, sound waves and unbounded media considered. Theoretical techniques presented and their application to wave propagation in the ocean, ionosphere and the earth treated. Prerequisite: ELE 453 or equivalent. Lec 3. **Cr 3.**

#### **ELE 553 Microwave Circuits and Devices**

Generation, transmission, control and detection of energy at microwave frequencies. Active and passive microwave devices: klystrons, magnetrons, traveling wave tubes. Solid state devices: microwave semiconductor diodes, tunnel diode amplifiers, Gunn oscillators, IMPATT and Josephson junction devices. Microwave integrated circuits: filters, couplers, circulators and combiners. Prerequisite: ELE 550. Lec 3. **Cr 3.**

#### **ELE 562 Microwave Acoustics**

The theory of acoustic wave propagation in nonpiezoelectric and piezoelectric media. Particular attention will be focused on bulk acoustic waves, surface acoustic waves, plate modes, pseudo surface acoustic waves and Bleustein-Gulyaev waves and how these waves may be utilized in microwave acoustic devices. Prerequisite: ELE 550 or permission. Lec 3. **Cr 3.**

#### **ELE 563 Design and Fabrication of Surface Wave Devices**

The design, fabrication and measurement systems for surface acoustic wave (SAW) devices. Basic design concepts for SAW devices, i. e.

delay lines, filters, resonators, oscillators, convolvers, sensors. Planar fabrication technique for SAW: surface properties of piezoelectric crystals, photolithography, vacuum technologies for thin film deposition. Electronic measurement systems for phase and amplitude characteristics of SAW devices, impulse and frequency response, phase and group velocity, insertion loss, distortions, spurious effects. Prerequisites: ELE 550, ELE 562 or permission. Lec 2, Lab 3. Cr 3.

#### **ELE 565 Semiconductor Devices I**

Physical principles underlying device operation. Topics include elementary excitation in semiconductors such as phonons, photons, conduction holes and electrons, carrier trapping and recombination, effect of high doping, contacts. Prerequisite: ELE 463 or equivalent. Lec 3. Cr 3.

#### **ELE 566 Semiconductor Devices II**

Application of the principles of ELE 565 to specific devices. Prerequisite: ELE 565. Lec 3. Cr 3.

#### **ELE 567 VLSI Devices and Technology**

VLSI device and process modeling, alternative device structures. Prerequisite: ELE 464. Cr 3.

#### **ELE 571 Advanced Microprocessor-Based Design**

Techniques for developing the software and hardware for microprocessor-based systems. Computer aided design using a multistation logic development system. Use of components commonly found in microprocessor-based systems. Prerequisite: ELE 471 or permission. Lec 2, Lab 3. Cr 3.

#### **ELE 580 Communications Engineering III**

Probability theory, random processes, optimum receivers, vector channels, matched filters, block orthogonal signaling, time-bandwidth product, channel capacity, and implementation of coded systems. Prerequisite: ELE 383 or equivalent. Lec 3. Cr 3.

#### **ELE 595 Graduate Seminar**

Detailed study from current technical literature of some aspect of electrical engineering and preparation of a paper or solution to a pertinent comprehensive problem. Cr 1-3.

#### **ELE 596 Transportation Vehicle and Urban Noise**

Theory of transportation system noise propagation; air transportation noise; noise-estimating procedures; noise exposure forecast, community exposure; surface vehicle noise; traffic noise models; urban noise propagation; criteria for air and surface vehicles. Prerequisite: ELE 436. Lec 3. Cr 3.

#### **ELE 598 Selected Advanced Topics in Electrical Engineering**

Advanced topics not regularly covered in other courses. Content can be varied to suit current needs. Course may, with permission, be taken more than once. Prerequisite: permission. Cr 1-3.

#### **Interdisciplinary Courses**

##### **INT 454 (ELE, PHY) Optical Communications**

Theory of optical dielectric waveguides; light propagation, attenuation, pulse broadening, and mode coupling in fiber-optic waveguides. Coupling components, semi-conductor light sources and detectors, modulation and switching of light, repeaters for fiber-optic systems, optical integrated circuits and optical communication systems. Prerequisite: permission of instructor. Lec 3. 1 Design Cr. Cr 3.

##### **INT 398 (CHE, CHY, ELE) Undergraduate Research Participation**

Research topics to be chosen by the students in consultation with faculty members in the departments and programs in the College of Engineering and Science. Students are required to submit a final report describing their research and present an oral seminar. Cr 1-3.



## Engineering Physics

Professors Smith (Chairperson), Brownstein, Camp, Carr, Czavinszky, Grunze, Hess, Kleban, Krueger, Morrow, Tarr, Unertl; Associate Professors Comins, Harmon, Mountcastle, Assistant Professors Clark, Batuski, Cook, Lad, McClymer, McKay

This curriculum meets the career needs of students who have a strong interest in engineering and science. It affords such students the opportunity to maintain a high degree of flexibility in designing a program to meet their specific career goals. This program is basically one of applied science, together with a sequence of engineering electives in one or more of the traditional engineering fields. It is developed around a framework of required courses in intermediate and advanced physics and mathematics, in addition to a meaningful group of engineering courses, some required and some elected. Thus, the emphasis is placed upon both engineering and physics. The program is particularly well suited to those students who have a broad range of engineering interests and who are likely to work in a number of engineering areas during their careers. The program is accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology.

The curriculum also is suited for those students who, by virtue of their ability and interest, may be preparing to do graduate work. Graduates have successfully pursued graduate study in physics and in various fields of engineering.

### Engineering Physics and Cooperative Education

Students in good standing enrolled in the engineering physics curriculum who have completed their second year of undergraduate work have the option of working for their de-

gree within a cooperative education program. Cooperative education is the integration of practical work experience, obtained through specific periods of employment in industry, business, or government, into the on-campus classroom and laboratory course curriculum. A student in the Cooperative Education Program works as a paid employee in an engineering environment at a job selected by mutual agreement with the student, the employer, and the Cooperative Education Coordinator of the Department of Physics. Academic credit is received through enrollment in PHY 495, Engineering Physics Practice.

### Graduate Work in Physics and Engineering Physics

Graduate opportunities and requirements for the master of science degree in physics and the doctor of philosophy degree in physics, and the master of engineering degree in engineering physics are described in the catalog of the Graduate School.

### Engineering Physics Curriculum

The following course schedule represents the program for a typical student in the engineering physics curriculum. There are possible alterations to this schedule and substitutions may be made for some courses on approval of the Chairperson of the Department of Physics. Students desiring to transfer from another engineering program in their freshman or sophomore year may do so without loss of credit or delays in graduation. The considerable flexibility in the engineering physics program will allow a student to design an individual curriculum with the assistance of his or her advisor.

#### Freshman Year

First Semester		Second Semester	
PHY 121 Physics for Engineers and Physical Scientists I	4	PHY 122 Physics for Engineers and Physical Scientists II	4
CHY 113 Chemical Principles I	4	Humanities Elective I	3
MAT 126 Analytic Geometry and Calculus	4	MAT 127 Analytic Geometry and Calculus	4
GEE 101 Introduction To Engineering Design	3	COS 220 Introduction to Computer Science	3
<b>TOTAL HOURS</b>	<b>15</b>	Engineering Sequence Elective I	3-4
		<b>TOTAL HOURS</b>	<b>17-18</b>

## Sophomore Year

First Semester		Second Semester	
PHY 236 Introductory Modern Physics	4	PHY 238 Mechanics	3
PHY 229 Physical Measurements Laboratory I	2	PHY 230 Physical Measurements Laboratory II	2
MAT 228 Analytic Geometry and Calculus	4	MAT 259 Differential Equations	4
Engineering Sequence Elective II	3	MET 109 Machine Shop and Welding	2
Humanities Elective II	3	Engineering Sequence Elective III	3
TOTAL HOURS	16	Humanities Elective III	3
		TOTAL HOURS	17

## Junior Year

First Semester		Second Semester	
PHY 441 Electricity and Magnetism I	3	PHY 455 Electricity and Magnetism II	3
PHY 341 Physical Electronics Laboratory	2	PHY 442 Modern Experimental Physics	2
MAT 453 Partial Differential Equations I	3	PHY 472 Geometrical and Fourier Optics	3
Engineering Sequence Elective IV	3	Math Elective (4)	3
Engineering Sequence Elective V	3	Humanities Elective V	3
Humanities Elective IV	3	Engineering Sequence Elective VI	3
TOTAL HOURS	17	TOTAL HOURS	17

## Senior Year

First Semester		Second Semester	
PHY 469 Quantum and Atomic Physics	3	PHY 482 Project Laboratory in Physics II	3
PHY 481 Project Laboratory in Physics I	3	PHY 489 Physics Seminar II	1
PHY 488 Physics Seminar I	1	Humanities Elective VI	3
Engineering Sequence Elective VII	3	Technical Elective* (6)	3
Physics Elective* (5)	3	Technical Elective*	3
Free Elective*	3	Free Elective	2-3
TOTAL HOURS	16	TOTAL HOURS	15-16
		TOTAL DEGREE HOURS: 130	

## Notes:

- Humanities Electives: 18 credit hours from an approved list are required for accreditation: at least two of these courses should be upper level.
- Students with programming experience may substitute ELE 172, Logic Systems (Cr 4).
- Engineering physics majors select an area of engineering concentration normally from among electrical, mechanical, chemical, and civil engineering. The engineering sequence consists of at least seven three-credit engineering courses. The college requirement of 16 hours of engineering design and 33 hours of engineering science normally can be met only through careful selection of the engineering sequence courses and those marked by \*. The list of possible courses is available in the department office.
- Choose from MAT 454, MAT 459, MAT 262, MAT 471, or an approved similar math course. Students also may satisfy this requirement by taking PHY 475, Mathematical Physics, in the fall of their senior year. PHY 475 may be counted either as a math elective or a physics elective, but not both.
- Possible Physics Electives:

First Semester: PHY 451, Advanced Meteorology; PHY 463, Statistical Mechanics; PHY 470 and 470L Nuclear Physics; PHY 475, Methods of Mathematical Physics; INT 454, Optical Communications; PHY 501 Mechanics.

Second Semester: PHY 447, Molecular Biophysics; PHY 462 Physical Thermodynamics; PHY 480, Physics of Materials; AST 451, Astrophysics.

- Technical Elective: physics, engineering, or approved science course.



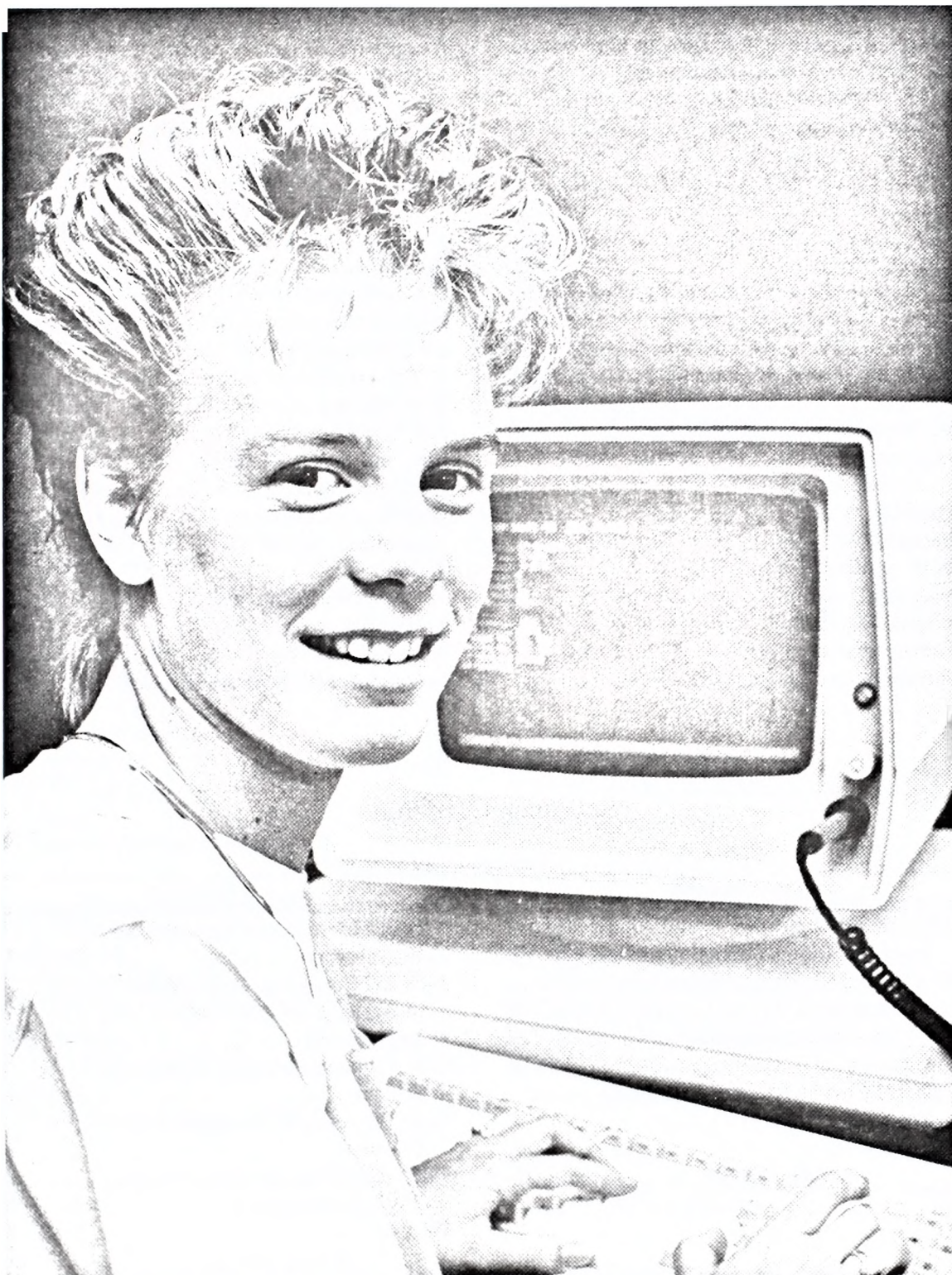
Engineering Physics students receive instruction and evaluation in technical writing as part of PHY 441 and PHY 442. Students not evaluated as satisfactory may be required to take an additional course (ENG 101 or ENG 317); this can be counted as a free elective.

Students admitted to the Honors Program

can substitute Honors courses for appropriate humanities and physics courses.

### Courses in Engineering Physics

Consult courses listed under Physics and Astronomy in the College of Arts and Sciences.



## Forest Engineering

Professors Ashley, Brann, Corcoran, Hoffman, Riley, Smith; Associate Professors Christensen, Hedstrom, Soule

The forest engineering curriculum, a joint administrative responsibility of the Bio-Resource Engineering Department and the Department of Forest Management, combines study of basic physical sciences, mathematics, engineering, and forestry to provide students with the in-depth education necessary in a career emphasizing the design, planning, and management of tree harvesting systems, logging equipment, and environmental engineering in general.

Forest engineering is engineering in a natural environment. Forest engineers are involved in reforestation methods, systems for wood production and harvesting, handling and transportation, forest road systems, design of improvised bridges, soil-water control, and conservation and recreational development.

A unique feature of the forest engineering curriculum is that it provides the academic background necessary for full association with both professional engineering and forestry societies. Founded upon intensive study in the physical and natural sciences, the professional subject matter contained in the program is directed toward off-campus as well as on-campus

study. The realities encountered in the use of mechanized logging equipment in a natural environment are recognized as the inherent constraints imposed by the interaction of technology, biology, and social order.

In addition to basic engineering and forestry courses, four specific areas of forest engineering are dealt with: forest machinery, soil and water control, forest roads and structures, and logging systems planning.

Graduates may find employment as forest engineers with companies producing forest machinery and equipment, with pulp and paper and lumber firms, and with federal and state agencies. Positions are open in research and development work, or in direct wood production and processing fields. Opportunities are nationwide in this area.

The curriculum in forest engineering is a joint offering of the Colleges of Engineering and Science, Applied Sciences and Agriculture, and Forest Resources. It is accredited by the Society of American Foresters and the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology.

The curriculum requires completion of 141 degree hours (including six degree hours in Forestry Field Practice) at an accumulative degree point average of not less than 2.0.

### Specimen Curriculum

Freshman Year			
First Semester		Second Semester	
AEN 220 Principles of Mechanization	3	AEN 255 Materials in Agricultural Engineering	3
FTY 200 Introduction to Forest Resources	1	AEN 257 Computer Applications in Agricultural and Forest Engineering	3 OR
MAT 126 Analytic Geometry and Calculus	4	COS 220 Introduction to Computer Science	(3)
PHY 121 Physics for Engineers and Physical Scientists I	4	MAT 127 Analytic Geometry and Calculus	4
Elective	3	PHY 122 Physics for Engineers and Physical Scientists II	4
<b>TOTAL HOURS</b>	<b>15</b>	Elective	4
		<b>TOTAL HOURS</b>	<b>18</b>

## Forest Engineering Curriculum

## Basic Sciences and Math

CHY 113 Chemical Principles I	4	MAT 259 Differential Equations	4
PHY 121 Physics for Engineers and Physical Scientists I	4	FTY 204 Statistical Inference in Forest Resources	3
PHY 122 Physics for Engineers and Physical Scientists II	4	AEN 257 Computer Applications in Agricultural and Forest Engineering	3 OR
MAT 126 Analytic Geometry and Calculus	4	COS 220 Introduction to Computer Science	(3)
MAT 127 Analytic Geometry and Calculus	4	Elective*	10
MAT 228 Analytic Geometry and Calculus	4	TOTAL HOURS	44

\*Recommended Bio-Earth Science electives include: PSS 150 Forest Soil Science, BOT 203 The Plant Kingdom, BOT 233 Dendrology, BOT 456

Students must take one protection course to meet accreditation standards in forestry: e.g., Forest Pathology, ENT 227 Introductory Entomology for Foresters

## Basic Engineering

AEN 281 Plane Surveying	1 OR	Dynamics	3
SVE 111 Plane Surveying	(4)	MEE 360 Fluid Mechanics	3 OR
MEE 150 Applied Mechanics: Statics	3	CIE 350 Hydraulics	(4)
MEE 230 Thermodynamics	3	AEN 268 Computer Aided Drafting and Design	3
MEE 251 Strength of Materials	3	TOTAL HOURS	19
MEE 270 Applied Mechanics:			

## Forest Engineering

FOE 206 Photogrammetry and Remote Sensing	3	Forestry	2
FOE 453 Harvesting of Forest Crops	2	FOE 472 Planning and Control of Forestry Operations	2
AEN 220 Principles of Mechanization	3	FOE 473 Forest Roads and Structures	3
AEN 255 Materials in Agricultural Engineering	3	FOE 474 Forest Machinery	3
AEN 465 Soil and Water Engineering	3	AEN 491 Design Project I	1
FOE 467 Agricultural and Forest Power	3	AEN 492 Design Project II	2
FOE 471 Production Analysis in	3	AEN 493 Design Project III	1
		TOTAL HOURS	31

## Forestry

FTY 200 Introduction to Forest Resources	1	FTY 408 Silviculture	2
FTY 205 Forest Biometry	3	FTY 409 Forest Ecology and Silviculture Field Laboratory	2
FTY 241 Field Practice on Small Woodlots	3	FTY 446 Forest Policy and Planning	3
FTY 341 Field Practice on Large Forests	3	FTY 449 Timber Management	2
FTY 407 Forest Ecology	3	FTY 450 Forest Resources Valuation	3
		TOTAL HOURS	25

## Humanities and Social Sciences

Economics	6	TOTAL HOURS	22
Electives	16		

TOTAL CREDIT HOURS REQUIRED FOR GRADUATION: 135 + 6 (May Term)

## Courses in General Engineering

The School of Engineering Technology offers general engineering service courses for students majoring principally in engineering.

### GEE 101 Introduction To Engineering Design I

Graphic principles, concepts, and techniques involving applied problems and creative exercises in orthographic projection, dimensioning, and data analysis. Exercises will be done in the form of sketches or created in 2D/3D form using CADD software. Lec and Rec 4. Cr 3.

### GEE 102 Introduction To Engineering Design II

A continuation of GEE 101 involving engineering graphics conventions, introduction to descriptive geometry, dimensioning, tolerances and fasteners; concludes with a creative design problem requiring preparation of working drawings. Prerequisite: GEE 101. Lec and Lab 4. Cr 3.

### GEE 116 Cartographics

Graphic principles, concepts, and techniques involving applied problems and creative exer-

cises in orthographic projection, data analysis, and cartography. Rec and Lab 4. Cr 2.

### GEE 207 Computer Programming for Engineers

Introduction to computer aided design using digital programming to solve engineering applied problems involving numerical methods and matrix algebra. Prerequisite: MAT 126. Lec 1, Rec 2. Cr 3.

### GEE 214 Architectural Drawing

The preparation of floor plans, elevations, sections, and pictorial renderings of homes and small buildings. Prerequisite: a basic GEE or GET drawing course or permission. Lec and Lab 4. Cr 3.

### GEE 302 Introduction to Microcomputer-Aided Design

The engineering design process utilizing the microcomputer as a tool in vector graphics, descriptive geometry, three-dimensional rotation for area and volume calculations, and statistical graphs; a creative design project incorporating the microcomputer to produce a set of working drawings is required. Prerequisite: GEE 101. Lec 1, Lab 4. Cr 3.

## Mechanical Engineering

Professors Grant (Chairperson), Hill, Lyman, Rivard, Sucec; Associate Professors Chapman, Johnson, Matthews, Poland, Sayles; Assistant Professors Boyle, Caccese, Dewhurst, Winowich; Research Professor Senders; Adjunct Assistant Professor Parker; Lecturer Abdel-Magid

This program is accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology.

Mechanical engineering is responsible for applying and creating knowledge in the fields of mechanics and heat (or thermal) science. Mechanics studies the interaction between forces and objects, the transmission of forces through materials, the motions and deformations that fluid and solid materials receive from applied forces. Thermal science studies the methods of producing high temperature sources and refrigerated regions of thermal energy, and the transmission and use of this energy and its con-

version to other useful forms such as electricity and the motion of vehicles.

The program provides the education needed for the pursuit of professional careers in both mechanics and the thermal science-based activities of mechanical engineering. The program has 10 elective courses among the total of 40 courses required for the degree. By careful use of this flexibility, students may pursue in depth their particular interests in technical and non-technical subjects. Student design and experimental projects are a learning-by-doing characteristic of the program's senior year. This breadth and flexibility results in a wide choice of opportunities upon graduation, including law, medicine, and business administration.

Mechanical engineers are employed in all industries. Their activities include equipment and product design and development, field installation and service of equipment and systems, manufacturing processes design and

management, sales, research, teaching, and administration. Many graduates become self-employed as professional consulting engineers or operators of their own technically-based companies.

## Graduate Work in Mechanical Engineering

Programs leading to the degrees of master of science in mechanical engineering and master of engineering (mechanical) are described in the University of Maine Graduate School Catalog.

## Double Major: Mechanical and Electrical Engineering

A student who earns a BSME can earn a BSEE by taking the additional courses: ELE 171, 172, 211, 212, 262, 314, 323, 342, 343, 351, 383, 400, 423, and the mathematics elective. ELE 212 can be used to replace ELE 224 in the mechanical engineering curriculum. *In addition, any of the courses ELE 314 Linear Circuits and Systems, ELE 342 Electronics I, ELE 343 Electronics II, ELE 351 Fields and Waves, or ELE 423 Energy Transmission and Conversion can be used to satisfy the Group 2, Engineering Science, elective requirement in the mechanical engineering curriculum.*

A student who earns a BSEE can earn a BSME by taking the additional courses GEE

101, MEE 231, 251, 270, 340L, 360, 380, 341, 432, 442, 443, 481, 482, and 483. Several of these can also satisfy technical elective requirements in the electrical engineering curriculum.

A minimum of one extra year will be required for the double major regardless of whether the basic degree is in mechanical or electrical engineering.

## Mechanical Engineering Department Cooperative Education Program

The Mechanical Engineering Department provides students the opportunity to participate in a cooperative education course, MEE 394. The course is under the direction of a mechanical engineering co-op coordinator who monitors the student's progress in the course. The course satisfies a design elective degree requirement of the Mechanical Engineering curriculum and requires that design project work be assigned by the cooperating company or agency.

## Pulp and Paper Option in Mechanical Engineering

This senior year mechanical engineering and fifth year pulp and paper program is described in the Chemical Engineering section of this catalog. It leads to the BSME degree and the pulp and paper certificate.

## Mechanical Engineering Curriculum

### Freshman Year

First Semester		Second Semester	
MAT 126 Analytic Geometry and Calculus	4	MAT 127 Analytic Geometry and Calculus	4
PHY 121 Physics for Engineers and Physical Scientists I	4	PHY 122 Physics for Engineers and Physical Scientists II	4
GEE 101 Introduction To Engineering Design	3	MEE 150 Applied Mechanics: Statics	3
ENG 101 English Composition	3	COS 215 Introduction to Computing Using FORTRAN	3
Elective*	3	Elective*	3
<b>TOTAL HOURS</b>	<b>17</b>	<b>TOTAL HOURS</b>	<b>17</b>

## Sophomore Year

First Semester		Second Semester	
MAT 228 Analytic Geometry and Calculus	4	MAT 259 Differential Equations	4
CHY 113 Chemical Principles I	4	ELE 215 Electric Circuit Fundamentals	3
MEE 230 Thermodynamics I	3	MEE 231 Thermodynamics II	3
MEE 251 Strength of Materials	3	MEE 270 Applied Mechanics: Dynamics	3
Elective*	3	Elective*	3
TOTAL HOURS	17	TOTAL HOURS	16

## Junior Year

First Semester		Second Semester	
ELE 224 Instrumentation	4	MEE 320 Materials Engineering and Science	3
MEE 340L Machine Tool Processing	2	MEE 341 Mechanical Laboratory I	3
MEE 360 Fluid Mechanics	3	MEE 381 Design II	3
MEE 380 Design I	3	MEE 356 Introduction to the Finite Element Method	3
Elective*	3	ENG 317 Technical Writing	3
TOTAL HOURS	15	TOTAL HOURS	15

## Senior Year

First Semester		Second Semester	
MEE 342 Mechanical Laboratory II	2	MEE 343 Mechanical Laboratory III	2
MEE 387 Design III	4	MEE 388 Design IV	4
MEE 332 Heat Transfer	3	Elective*	3
Elective*	3	Elective*	3
Elective*	3	Elective*	3
TOTAL HOURS	15	TOTAL HOURS	15

The curriculum contains 10 elective courses, six of which (18 credit hours) must be approved humanities or social sciences, and four must be technical with the courses selected from specified groups.

### Courses in Mechanical Engineering

#### MEE 150 Applied Mechanics: Statics

The study of force systems and equilibrium, structural models, friction, distributed forces. Designed to develop the ability to analyze and solve engineering problems. Rec 3. Cr 3.

#### MEE 230 Thermodynamics I

Energy and energy transformations; the First and Second Laws applied to systems and to control volumes; thermodynamic properties of systems, availability of energy. Prerequisite: MAT 127. Rec 3. Cr 3.

#### MEE 231 Thermodynamics II

A continuation of MEE 230. Thermodynamics of mixtures; chemical thermodynamics, thermodynamics of fluid flow, vapor and gas cy-

cles, applicable to compressors, internal combustion engines and turbines. Computer usage will be required. Prerequisite: MEE 230, COS 215 or equivalent. Rec 3. Cr 3.

#### MEE 251 Strength of Materials

The principles of solid mechanics and their applications to practical problems, stresses and deflections in axial loading, torsion, beams, columns, combined stresses. Prerequisite: MEE 150, MAT 127 and COS 215 or equivalent. Rec 3. Cr 3.

#### MEE 252 Statics and Strength of Materials

The basic principles of statics and their applications in strength of materials. Equilibrium of various systems. Stresses and deformations of axially loaded members, connections, circular shafts, beams and columns. Prerequisite: MAT 127. Rec 3. Cr 3.

#### MEE 270 Applied Mechanics: Dynamics

Motion of particles and rigid bodies; force, mass and acceleration; impulse and momentum; work and energy and simple harmonic

motion. Prerequisite: MEE 150 or MEE 252, and MAT 128. Rec 3. Cr 3.

**MEE 320 Materials Engineering and Science**  
The principles of material science with emphasis on the relationship between structure and properties and their control through composition, mechanical working and thermal treatment. Prerequisite: MEE 230 and MEE 251. Rec 3. Cr 3.

**MEE 332 Heat Transfer**  
The fundamental laws of heat transfer by conduction, convection and radiation. Application to the study of engineering problems via analytical, numerical, and graphical techniques. Prerequisite: MAT 259 and MEE 360. Rec 3. Cr 3.

**MEE 335 Internal Combustion Engines**  
Application of thermodynamic laws and principles to internal combustion engine cycles, design and operation; fuels and combustion, carburetion, detonation, cooling, and lubrication. Prerequisite: MEE 230. Rec 3. Cr 3.

**MEE 340L Machine Tool Processing**  
The characteristics and operation of machine tools. Numerically controlled machining. Computer directed machining from memory contained blueprints. Lab 3. Cr 2.

**MEE 341 Mechanical Laboratory I**  
An introduction to experiment design, data analysis, laboratory techniques, instrumentation, and calibration of equipment. Application to thermodynamics, mechanics of materials, fluid mechanics and metallurgy. Prerequisite: MAT 259, MEE 251 and MEE 360. Rec 1, Lab 3. Cr 3.

**MEE 342 Mechanical Laboratory II**  
A continuation of MEE 341. Mechanical engineering problems in a laboratory setting. Prerequisite: MEE 231, MEE 341 or permission. Lab 3. Cr 2.

**MEE 343 Mechanical Laboratory III**  
A continuation of MEE 442. Mechanical Engineering problems in a laboratory setting. Prerequisites: MEE 231, MEE 341, MEE 342 or permission. Cr 2.

**MEE 356 Introduction to Computational Methods**  
Foundations of numerical methods for solution of partial differential equations. Existing and prepared programs are applied to engineering problems in heat transfer, solid mechanics, and fluid dynamics. Prerequisite: MAT 259. Rec 3. Cr 3.

**MEE 360 Fluid Mechanics**  
Fluid statics, kinematics, Bernoulli equation, free-surface flow, viscosity, friction, dimensional analysis and similitude, and an introduction to compressible flow. Prerequisite: MEE 230, MEE 270, and MAT 259. Rec 3. Cr 3.

**MEE 371 Mechanical Vibrations**  
Free and forced vibrations with viscous damping for discrete and continuous mass systems. Derivation and application of energy methods. Applications. Prerequisite: MEE 270 and MAT 259. Rec 3. Cr 3.

**MEE 380 Design I**  
Kinematical design of machines. Prerequisite: MEE 270. Lec 3. Cr 3.

**MEE 381 Design II**  
Analysis of mechanical elements. Advanced concepts in mechanics of materials, stress concentration, fatigue, factor of safety. Introduction to creative synthesis and economic design. Prerequisite: MEE 251 or MEE 252, MAT 259. Rec 3, Comp 2. Cr 3.

**MEE 383 Turbomachine Design**  
The theory and design of turbomachinery flow passages; control and performance of turbomachinery; gas-turbine engine process. Prerequisite: MEE 230. Rec 3. Cr 3.

**MEE 384 Power Plant Design and Engineering**  
Power station engineering and economy. Design, construction and operating theory of steam, internal-combustion, and hydroelectric power plants. An introduction to nuclear power plants, utilization of solar energy, fuel cells, and associated problems. Prerequisite: MEE 230. Rec 3. Cr 3.

**MEE 385 Heating and Ventilating System Design**  
Determination of heating ventilating requirements for buildings and industrial processes. Analysis of heat transfer devices and their applications. Heating and ventilating systems designs, layout and control. Prerequisite: MEE 230. Rec 3. Cr 3.

**MEE 386 Refrigeration and Air Conditioning System Design**  
Methods of producing artificial low temperatures. Refrigeration for controlled-temperature applications in comfort air conditioning and industrial manufacturing processes and their control. Prerequisite: MEE 230. Rec 3. Cr 3.

**MEE 387 Design III**  
Design of mechanical engineering systems

components, including problem definition, analysis, synthesis and optimization. Prerequisite: MEE 231, MEE 381; MEE 332 concurrently or permission. Rec 4. **Cr 4.**

#### **MEE 388 Design IV**

Design of mechanical engineering systems, including problem definition, analysis, synthesis and optimization. Prerequisite: MEE 231, MEE 381; MEE 332 concurrently. Rec 4. **Cr 4.**

#### **MEE 394 Mechanical Engineering Practice**

Full-time engineering work with participating companies of the Mechanical Engineering Department Cooperative Education Program. Course may be taken more than once. (Pass/Fail Grade Only). **Cr 3.**

#### **MEE 397 Seminar**

Rec 1. **Cr Ar.**

#### **MEE 421 Metallography**

Methods of preparation of metal specimens for optical microstructure examination. Microstructure interpretation. Effect of processes on microstructure. Photomicroscopy. Microhardness testing. Experimental problems. Prerequisite: MEE 320 or permission. Lab 6. **Cr 3.**

#### **MEE 422 Thermal and Mechanical Processing of Engineering Metals**

Microstructure and mechanical property control of carbon and alloy engineering steels, tool steels, stainless steels, cast irons and selected nonferrous alloys through heat treatment and mechanical working. Constraints imposed on design, fabrication, and service environment by processing. Failure analysis. Prerequisite: MEE 320. Lec 3. **Cr 3.**

#### **MEE 433 Solar-Thermal Engineering**

An introduction to the fundamentals of solar energy collection and use as process thermal energy. Performance analysis of solar collectors and thermal energy storage devices both separately and combined as a system. Prerequisite: MEE 230. Rec 3. **Cr 3.**

#### **MEE 434 Thermodynamic Design of Engines**

An introduction to combustion, with applications to the design of propulsion systems, such as gas turbines, I-C engines, rocket engines. Prerequisite: MEE 231. Rec 3. **Cr 3.**

#### **MEE 453 Experimental Mechanics**

Experimental methods and techniques for analysis of stress and displacement and their engineering significance. Electric strain gages, brittle lacquers, mechanical and optical strain

gages, and introduction to photoelasticity. Prerequisite: MEE 251. Rec 2, Lab 2. **Cr 3.**

#### **MEE 454 Theory of Elasticity**

Plane stress and plane strain, stress function. Problems in Cartesian and polar coordinates. Photo-elasticity, strain energy. Three-dimensional problems. Prerequisite: MAT 259 and MEE 251. Rec 3. **Cr 3.**

#### **MEE 455 Advanced Strength of Materials**

Limitations of elementary stress formulas, theories of failure, unsymmetrical bending, beams, plates, torsion of non-circular bars, thick-walled cylinders, stress concentrations, energy methods, and introduction to theory of elasticity. Prerequisite: MEE 251. Rec 3. **Cr 3.**

#### **MEE 457 Advanced Application of the Finite Element Method**

The course will consider applications of the finite element method to a variety of problems in Mechanical Engineering. Some of the applications considered include flow in porous media, transient and steady state heat transfer, linear/nonlinear problems in viscous flow, solid mechanics and dynamics problems. The emphasis of the course would be to use for the most part available computer programs for specific physical problems. The topics covered will depend upon the instructor. Prerequisite: MEE 456 or permission. Rec 3. **Cr 3.**

#### **MEE 461 Compressible Fluid Flow I.**

The dynamics of compressible flows. Fundamental equations and concepts will be considered in isentropic flow, normal shock waves, flows in constant area ducts, and generalized one-dimensional continuous flow. Prerequisite: MEE 230 and MEE 360. Rec 3. **Cr 3.**

#### **MEE 462 Fluid Mechanics II**

Flow in multiple-pipe systems, boundary-layer flows, inviscid incompressible flow, compressible flow, open-channel flow. Prerequisite: MEE 360. Lec 3. **Cr 3.**

#### **MEE 472 Advanced Dynamics**

Particle dynamics, planetary motion, projectiles, variable mass motion, angular momentum, impact. Generalized constraints, coordinates and forces. Hamilton's principle. Lagrange's equations. Gyroscopes. Prerequisite: MAT 259 and MEE 270. Lec 3. **Cr 3.**

#### **MEE 523 Fatigue Failure**

Mechanisms of metal fatigue. Metallurgical, mechanical and environmental factors affecting fatigue. Methods of failure analysis. Prerequisite: MEE 320 or permission. **Cr 3.**



**MEE 536 Advanced Heat Transfer I**

Transfer of heat by conduction. Use of approximate, exact analytical, and numerical techniques for the prediction of temperature distributions in both the steady and unsteady state. Prerequisite: MEE 332. Cr 3.

**MEE 544 Mechanical Engineering Analysis I**

Formulation and study of mathematical models applicable to mechanical engineering. Problems in heat transfer, thermodynamics, solid and fluid mechanics. Prerequisite: permission. Cr 3.

**MEE 545 Mechanical Engineering Analysis II**

Extremum problems and variational calculus with applications in mechanical engineering. Approximate solution techniques for ordinary and partial differential equations that occur in heat transfer, and solid and fluid mechanics. Prerequisite: permission. Cr 3.

**MEE 557 Introduction to Continuum Mechanics**

General formulation of classical field theories; fundamental concepts of motion, stress, and energy for a continuum. General nature of constitutive equations for a continuum. Prerequisite: MEE 251 or permission. Cr 3.

**MEE 562 Advanced Fluid Mechanics**

Development of the differential and integral equations of mass, momentum, and energy conservation for viscous fluids. Application of these to internal, external, and boundary layer

flows of incompressible, viscous fluids. Prerequisite: MEE 360. Cr 3.

**MEE 573 Advanced Vibrations I**

Advanced vibration theory and applications. Multi-degree of freedom systems. Transient and random vibrations. Lagrange's equation. Laplace transformation and matrix iteration. Computer techniques. Prerequisite: MEE 371. Cr 3.

**MEE 574 Advanced Vibrations II**

Theory of vibrations with continuously varying mass and stiffness. Solutions of wave equations for strings, longitudinal and torsional systems. Vibration of beams. Methods of Rayleigh, Ritz and Stodola. Introduction to non-linear vibrations. Prerequisite: MEE 573 or permission. Cr 3.

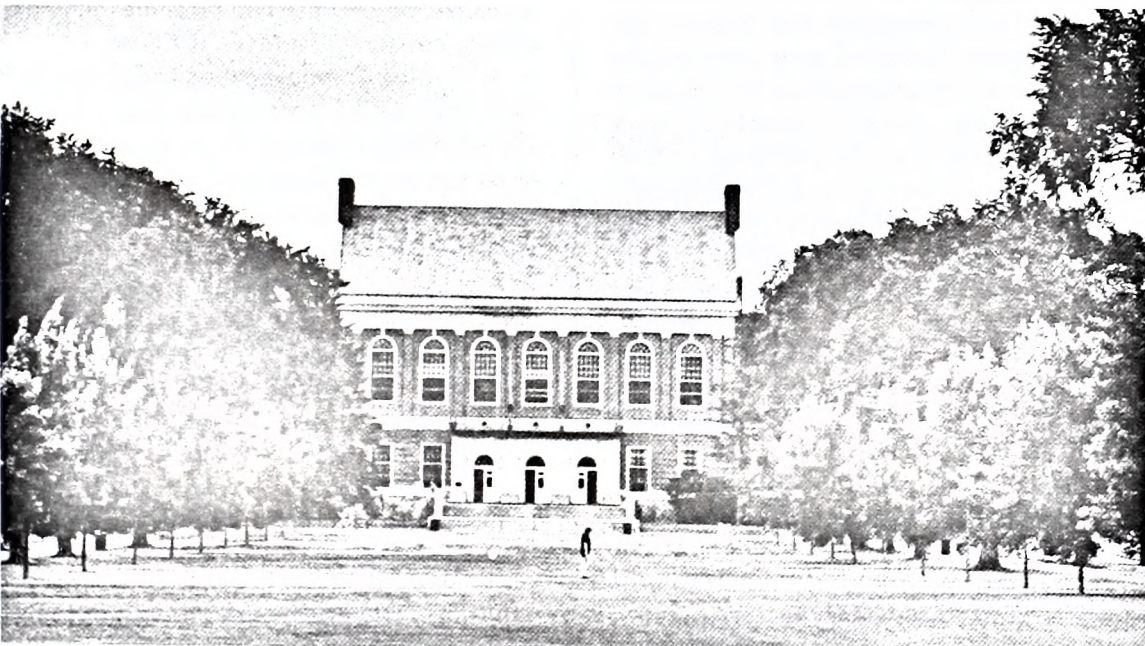
**MEE 588 Advanced Thermodynamics II**

A continuation of MEE 434, including the study of chemical equilibrium in systems of reacting gases, with applications to the design of propulsion systems, particularly rockets. Prerequisite: MEE 434. Cr 3.

**Interdisciplinary Course****INT 485 (MEE, PSY) Human Factors Engineering**

This course will introduce students to the theoretical bases and practical applications of Human Factors Engineering, and Man-Machine Systems Analysis. Third year standing in any field of engineering or (for students from other faculties) permission of the instructor.

Cr 3.



## Military Science

Professor of Military Science LTC Porter; Instructors CPT Fofi, CPT Bucchin, CPT Toderico, MSG DeRapps, SFC Gernacy; Supply Technician Mr. Bowden

### General

The Department of Military Science conducts general military science education at two levels, basic and advanced military studies. MS I and II level courses are open to all university students. Students taking 100 and 200 level courses are under *no obligation to the U. S. Army in any way*—Students may take MS courses at the 300 and 400 level with the permission of the Professor of Military Science. Students wishing to contract and pursue a commission in the U. S. Army as a Second Lieutenant may do so in one of three (3) ways: 1. be selected and accept an ROTC Scholarship, 2. complete MIS 101, 102, 201 and 202 classes with a grade of C or better, be recommended by the MS II advisor and sign a contract at either the end of their sophomore year or during the first semester of their junior year, 3. complete "basic camp" at Fort Knox, KY, during the summer between their sophomore and junior year, at which time the student is eligible to contract if he/she desires to do so.

### The Advanced Course

The Advanced Course is open to students who have been accepted by the professor of military science and have completed the Basic Course or the equivalent. Students must complete the courses numbered greater than 300. In addition, students are required to attend a six-week ROTC Advanced Camp at Fort Bragg, North Carolina, between their junior and senior years. In exceptional cases, ROTC Advanced Camp may be deferred by the professor of military science until the student completes the senior year. Selected students may attend Ranger School in lieu of ROTC Advanced Camp. Students receive \$100.00 a month and may be commissioned in either the Army Reserve, Army National Guard or Active Army.

### Scholarship Program

The Department of Army offers four, three and two year ROTC scholarships to selected stu-

dents, regardless of enrollment in the Military Science Program, who have demonstrated outstanding leadership and scholastic ability. These scholarships pay full tuition for the respective number of years at the University, mandatory fees, a stipend for textbooks, and \$100 per month during the academic year for the duration of the scholarship. Four year scholarship winners who attend the University of Maine will reserve an *additional \$1,000 per year grant* from the University.

### Simultaneous Membership Program

Students who are members of the Army National Guard or the Army Reserve and who have completed basic training may qualify for entry into the Advanced Course upon completing freshman year. The student is automatically advanced to the pay grade of E-5 in his or her Guard/Reserve unit upon entering the ROTC program and receives training as a "third lieutenant." Upon completion of the Advanced Course, the student is eligible to be commissioned as a Second Lieutenant in the National Guard, Army Reserve, or Active Army.

### Professional Military Education Courses

All ROTC cadets must complete the following undergraduate *type* courses. (CCR145-3)

1. Written Communication Skills.
2. Human Behavior Skills.
3. Military History.
4. Computer Literacy.
5. Math Reasoning.

Recommended Courses:

1. Management Skills.
2. National Security Studies. All colleges will accept up to 15 credit hours of Military Science courses as free electives towards degree completion, except the College of Arts and Sciences which accepts only Advanced Course credits (10) and the College of Education which requires students to meet with their advisors to determine course applicability toward program requirements. All Mili-

tary Science credits count towards a student's overall GPA.

### Areas of Specialization

	Credits
Military Science	
MIS 040 Mountain School	-0-
MIS 050 Northern Warfare School	-0-
MIS 060 Air Assault School	-0-
MIS 070 Airborne School	-0-
MIS 080 Winter Survival School	-0-
MIS 090 Ranger School	-0-
MIS 100 Leadership Laboratory (R-O)	-0-
MIS 101 Introduction to Leadership (R-O)	-1-
MIS 102 Introduction to the United States Army (R-O)	-1-
MIS 105 Military Physical Fitness (E)	-1-
MIS 201 Basic Military Skills (R-O)	-1-
MIS 202 Orienteering (R)	-1-
MIS 250 First Aid (E)	-2-
MIS 290 Basic Camp (R-O)	-6-
RPM 300 Global Wilderness Survival (E)	-3-
MIS 310 Advanced Leadership (R)	-3-
MIS 320 Advanced Tactics (R)	-3-
MIS 390 Advanced Camp (R)	0-6
MIS 410 Military Management and Justice (R)	-2-
MIS 420 Leadership and Ethics (R)	-3-
<b>TOTAL</b>	<b>14-22</b>

(R) Required

(R-O) Required-Optional depending on specific commissioning program

(E) Elective

### Courses in Military Science

#### MIS 040 Mountain School

A 22 day school conducted currently in Vermont stressing basic mountaineering training, ropes, knots and rappelling as appropriate to the training conditions. Available only to students in the ROTC Program. (Pass/Fail Grade Only). **Cr 0.**

#### MIS 050 Northern Warfare School

A 30 day school conducted at the Northern Warfare school in Alaska. Available only to students in the ROTC Program. (Pass/Fail Grade Only). **Cr 0.**

#### MIS 060 Air Assault School

A ten-day school conducted at Ft. Campbell, Kentucky on the tactical utilization of Army Helicopters. Available only to students in the

ROTC Program. Students who graduate are awarded the Army Air Assault Badge. (Pass/Fail Grade Only). **Cr 0.**

#### MIS 070 Airborne School

A three-week school conducted at Fort Benning, Georgia. Available only to students in the ROTC Program. Students who graduate are awarded the Army Parachutist Badge. (Pass/Fail Grade Only). **Cr 0.**

#### MIS 080 Winter Survival School

A five-day school conducted at Brunswick Naval Air Station and in the Rangeley area by the U. S. Navy. Transportation is provided by the Army. Instruction and practical experience in winter survival equipment and techniques. Enhancement of the student's self-confidence in his/her ability to survive in an extremely rigorous environment. Offered during January. Students apply for enrollment to the Professor of Military Science during October. (Pass/Fail Grade Only). **Cr 0.**

#### MIS 090 Ranger School

A 9 week school conducted at Fort Benning, Georgia available only to students in the ROTC Program. Students who graduate will be awarded the Ranger Tab if, they complete all ranger course requirements. (Pass/Fail Grade Only). **Cr 0.**

#### MIS 100 Leadership Laboratory

Leadership Lab is a requirement for all regular program cadets. The purpose of Leadership Lab is to provide the environment wherein each cadet can develop and improve military leadership skills. Continuous counselling and periodic evaluations of cadet performance are the primary methods used. In case of class conflicts an alternate Leadership Lab will be arranged to meet student requirements). (Pass/Fail Grade Only). **Cr 0.**

#### MIS 101 Introduction to Leadership: Theory and Application

Includes study and discussions of leadership concepts, traits, beliefs, values, and ethics. Provides increased self-confidence through physical training in rappelling, mountaineering skills, leadership reaction course, and first aid. Opportunity for leadership and group development through practical application of leadership skills in classroom and outdoor laboratory environments. Leadership self assessment paper required upon completion of semester study. Participation in Leadership Laboratory (MIS 100) is suggested but optional. **Cr 1.**

### **MIS 102 Introduction to the United States Army**

Study of past and current Army leaders and contrasting styles of leadership. Discussion of the politics of leadership at increasing levels of responsibility. Introduction to the organizational structure and role of the Army, awareness and study of physical fitness and mental health interrelation. Training and development of communication skills to improve individual performance and group interaction. Participation in Leadership Lab (MIS 100) required.

Cr 1.

### **MIS 105 Military Physical Fitness**

Study and experience in leading and participating in the U. S. Army physical fitness program. The role of exercise and fitness in one's life, as well as the development of an individual training program, will be emphasized. Experience in a variety of aerobic exercises and strength building programs will provide actual leadership and fitness opportunities. Cr 1.

### **MIS 201 Basic Military Skills**

Study and practice in military skills required during completion of the Army ROTC Basic Course: Physical Fitness Program Planning, Military Correspondence, Oral Briefings and Communications, Command and Staff Functions, Basic Military First Aid and the Leadership Assessment Program. Subjects promote understanding of the Roles and Organization of the Army, World Military Powers, and the Principles of War. The Leadership Assessment Program investigates leadership techniques and the processes used in leadership situations. Participation in Leadership Lab (MIS 100) is required.

Cr 1.

### **MIS 202 Orienteering**

A skills class in Map Reading and Land Navigation based on the sport of Orienteering. Through the use of topographic maps and compasses in training for and practicing navigation (cross country travel), the instruction will take place both inside and outside. Comprehensive instruction, preparation, and practice in the sport of Orienteering. Participants in this course will need appropriate outdoor clothing and may experience rigorous physical activity. Participation in Leadership Lab (MIS 100) is suggested but optional.

Cr 1.

### **MIS 290 ROTC Basic Camp**

A six-week summer camp conducted at Fort Knox, Kentucky. The student receives pay, and travel costs are defrayed by the Army. The environment is rigorous, and is similar to Army

Basic Training. No military obligation incurred. Training includes the role and mission of the U. S. Army, map reading and land navigation, first aid, marksmanship, leadership, physical training, parades, and tactics. Completion of MIS 290 satisfies all Basic Course requirements. Four different cycles offered during the summer, but candidates are accepted during the entire spring semester. Participation in a physical fitness program during the spring semester is required. Students apply for enrollment to the Professor of Military Science. Selection for attendance is based on qualifications and merit.

Cr 6.

### **MIS 310 Advanced Leadership**

Exposure to Advanced Principles of Leadership applicable to all professional areas of study in both civilian and military careers. Fundamentals of Leadership Theory, Psychology of Leadership, Leadership Environment, Interpersonal Communication and Contemporary Human Problems. Historical study of U. S. Army, its leadership, its effect and contributions to the formulation period of America during the period circa 1770-1898. Participation in Leadership Laboratory (MIS 100) and FTX's is required.

Cr 3.

### **MIS 320 Advanced Tactics**

Rifle squad, platoon level tactics including offensive, defensive tactics, squad and platoon level patrolling skills, operation orders, combined arms tactics, field fortifications, camouflage and concealment at squad and platoon level. MIS 320 students will also participate in an intensive physical training, primary marksmanship instruction, land navigation skills and other basic soldier level training in preparation to attending advanced camp the summer between their junior and senior year. Participation in Leadership Laboratory (MIS 100) and FTX's is required.

Cr 3.

### **MIS 390 ROTC Advanced Camp**

A six week camp conducted at Fort Bragg, NC. The student receives pay. Travel costs are defrayed by the U. S. Army. The Advanced Camp training environment is highly structured, stressing physical training and basic tactical training at squad and platoon leadership levels. Individual leadership training is evaluated throughout the full training period. Training includes: advanced land navigation skills, marksmanship training, tactical training, combined arms demonstrations, Army branch orientation and air mobile operations. Eight different cycles are offered during the summer.

Participation in a structured physical fitness program during the spring semester prior to attending advanced camp is required. (Pass/Fail Grade Only). **Cr 0-6.**

#### **MIS 410 Military Management and Justice**

Branches of the Army and their selection by designated commissionees. Training management, to include preparation of training schedules and Battalion Training Management System. Military Law at the unit level and higher; covers both non-judicial punishment and the Uniform Code of Military Justice. The Army Installation and Post Support System; its uses and requirements. Army Logistics System; how it functions and its manipulation.

Participation in Leadership Laboratory (MIS 100) and FTX's is required. **Cr 2.**

#### **MIS 420 Leadership and Ethics Seminar**

Exposure to larger unit tactics, staffing and operations. Military History; involves study of U. S. Army from World War I to present limited actions. Ethics composes the largest portion of the classroom training and writing projects. Ethics will cover situations ranging from conduct during peace through wartime activities, many case studies will be utilized. Law of Land Warfare, intensive investigation of the rules and regulations covering conduct during war. Participation in Leadership Laboratory (MIS 100) and FTX's is required. **Cr 3.**

## NAVAL SCIENCE

Professor of Naval Science CDR Meter; Assistant Professors LT Chicoine, LT Melin

### General Information

The Naval ROTC program is designed to train and educate well-qualified students for ultimate commissioning and active service as officers in the United States Navy and United States Marine Corps. In order to be eligible for application for this program a student must:

1. be a U. S. citizen
2. be at least 17 but less than 21 years of age
3. be physically qualified
4. possess satisfactory records of academic ability and moral integrity
5. demonstrate those characteristics desired of a Naval Officer; and
6. have no moral obligation or personal conviction that will prevent the bearing of arms.

The NROTC Scholarship Program offers the following benefits: all tuition paid, books furnished, \$100 per month subsistence allowance during the school year and a substantial uniform allowance. Graduates of this program receive regular commissions in the United States Navy and Marine Corps and are required to serve on active duty for four years. High school students may apply for the scholarship program between March 1st of their junior year to November 15th of their senior year. Application forms are available from any Navy recruiter and most guidance counselors. Early

application is recommended, as this program is highly competitive. Students already enrolled in UM may also be eligible for scholarships. Call the NROTC unit at 581-1551 for further information.

The NROTC College Program offers students not selected to receive a scholarship an opportunity to participate in NROTC. The monetary benefits of the college program include: a substantial uniform allowance and \$100 per month subsistence allowance during their junior and senior class years. Graduates of the college program receive reserve commissions and are required to serve on active duty for three years. Students may apply for the college program from the beginning of their freshman year to the end of their sophomore year. For further information concerning either program, contact your local Navy recruiter or the NROTC unit. (Telephone: 207-581-1551)

### Courses in Naval Science

#### **NAV 101 Introduction to Naval Science**

This course introduces the student to the organization of the U. S. Navy. It examines the historical development of the Navy, the development of seapower, and its application in a geopolitical world today. The course also introduces the student to the many career paths available in aviation, surface warfare, nuclear power, and the Marine Corps. An understanding of the responsibilities of a naval officer, the Navy's mission,

general military information, and the applications of these concepts within the Navy is also stressed. **Cr 2.**

**NAV 102 Naval Ships Systems I (Engineering)**

The course examines the engineering systems presently in use aboard a U. S. Naval Ship. Major emphasis is given to shipboard propulsion systems with additional coverage of auxiliary equipment and ship structural design. **Cr 3.**

**NAV 200 Sailtraining**

This course will be conducted through the use of various U. S. Navy ships, ashore training facilities and primarily onboard the unit's sail training yachts Intrepid and Santee. The cruise will consist of approximately 3 weeks aboard the yachts and 2 weeks aboard fleet ships. **Cr 3.**

**NAV 201 Naval Ships Systems II (Weapons)**

This course provides an indepth study of the theory and principles of operation of contemporary naval weapons systems. It includes coverage of weapons system types, capabilities and limitations; theory of target acquisition, identification and tracking; trajectory principles; and basics of naval ordinance. **Cr 3.**

**NAV 202 Seapower and Maritime Affairs**

This course provides an overview of United States Naval History and a study of the more important issues involved in a use of the sea. It also introduces the student to the nature of the Soviet challenge in the oceans of the world and explores current trends in maritime developments. **Cr 3.**

**NAV 301 Navigation and Naval Operations I**

This course provides the prospective Naval Ensign with a fundamental understanding and practical working capability in safe navigation. Included is a comprehensive treatment of coastal piloting and an introduction to celestial and electronic navigation methods. **Cr 3.**

**NAV 302 Navigation and Naval Operations II**

This course familiarizes the student with the functions and responsibilities of the Junior Naval Officer in the areas of shipboard operations and administration. Included is a comprehensive study of Naval communications procedures, formation maneuvering, replenishment at sea, fundamentals of three dimensional warfare and a thorough overview of inland and international rules of the road. Prerequisite: NAV 301. **Cr 3.**

**NAV 303 Naval Leadership and Management I**

A study of the basis for the development of effective managerial and leadership competence. In this course the student's attention is focused on the human side of the complex, formal organizational reality of the Navy. **Cr 3.**

**NAV 304 Naval Leadership and Management II**

A study of personnel and equipment management which familiarizes the student with the scope of the duties, responsibilities, and overall authority of a newly commissioned Naval Officer. Topics include: counseling and interviewing; performance appraisal. The Navy Human Resource Management Support System; Military Law; and Division Administration. **Cr 3.**

# School of Engineering Technology

Professors McDonough (Director), Hamilton, Webster, Westfall; Associate Professors Crosby, Elliott, Furbish, Gray, Hayes, Johnston, Metcalf; Assistant Professors Dvorak, Viger, Walk; Instructor Madden; Lecturers Grecni, Johnson, Newman

Engineering technology programs are offered at both the Associate's and Bachelor's Degree. Matriculation will normally be in the bachelor's program. The associate degree is available upon request.

## Associate of Science in Engineering Technology

Associate degree programs are offered in civil, electrical, and mechanical engineering technology. The programs are designed to develop technical competence for a career as an engineering technician, and as a basis for further study. The three programs are accredited by the Technology Accreditation Commission of the Accreditation Board for Engineering and Technology. (TAC/ABET)

## Graduation Requirements

1. An accumulative average of 2.0 in all major courses (i. e. , CET, EET, MET).
2. An accumulative average of 2.0.
3. Passing grades in all other required courses in the program of study.
4. A minimum of 70 degree hours (depending on program).

## Bachelor of Science in Engineering Technology

Bachelor's programs are offered in construction management technology, electrical and mechanical engineering technology. The programs are designed to prepare students for practical work in the application of scientific and engineering principles in the solution of practical problems. The BSEET & BSMET programs are accredited by the Technology Accreditation Commission of the Accreditation Board for Engineering and Technology.

## Graduation Requirements

1. An accumulative average of 2.0 in all major courses (i. e. , CET, EET, MET).
2. An accumulative average of 2.0.
3. Passing grades in all other required courses in the program of study.
4. A minimum of 64 degree hours beyond the associate degree studies (depending on program).

## Transfer Credit

All students who transfer to the School of Engineering Technology from another institution must earn a minimum of 18 hours of Orono courses to qualify for the A. A. S. degree, and 36 hours of Orono courses to qualify for the B. S. degree.

Degree credit will be allowed for appropriate courses in which grades of "C" or above have been received from accredited degree programs. *Degree* credit is not allowed for courses taken in certificate or diploma programs.

All students who transfer to the School of Engineering Technology B. S. programs with an appropriate Associate degree from a TAC/ABET accredited program (Technology Accreditation Commission of the Accrediting Board for Engineering & Technology) will receive full credit for that degree.

Evaluation of all such courses and programs for approval of degree credit and possible equivalency rests with the Director of the School of Engineering Technology.

## Civil Engineering Technology

The Associate Degree curriculum is designed to provide the student with a basic grounding in the physical and mathematical sciences, engineering graphics, computer usage, communication skills, surveying, materials testing, structures, highways and construction. In addition to these basic courses, students specialize in one of two tracks: the construction track or the surveying track. The construction track offers additional courses in construction techniques and construction management and the surveying track offers additional courses in advanced surveying topics.

These specialized studies are coordinated so as to prepare the associate degree graduate as an engineering technician in the areas of surveying, materials testing, structural engineering, public works engineering and construction engineering. The emphasis in all

work is on the practical applications and aspects of civil engineering design and construction. Employment opportunities are excellent for the well-trained civil engineering technician.

### Civil Engineering Technology Curriculum (Surveying Track)

First Semester		Second Semester	
CET 101 Elementary Surveying	4	CET 102 Advanced Surveying	4
GET 115 Computer Programming Fundamentals	3	CET 121 Materials, Properties and Testing	4
GET 121 Technical Drawing	3	GET 132 Surveying Graphics	3
MAT 142A Algebra and Trigonometry	3	MAT 164A Analytical Geometry and Introductory Calculus	3
PHY 107 Basic Physics	4	PHY 108 Basic Physics	4
<b>TOTAL HOURS</b>	<b>17</b>	<b>TOTAL HOURS</b>	<b>18</b>
Third Semester		Fourth Semester	
CET 211 Structural Mechanics	4	CET 212 Structural Design	4
ENG 101A Critical Written Expression	3	CET 232 Civil Works Technology	3
MAT 246A Introductory Calculus	4	CET 240 Civil Management Technology	3
SVE 221 Legal Aspects of Land Surveying	3	SPE 101A Oral Communications	3
SVE 331 Photogrammetry	3	SVE 321 Cadastral Systems	3
<b>TOTAL HOURS</b>	<b>17</b>	Humanities/Social Science Elective	3
		<b>TOTAL HOURS</b>	<b>19</b>

TOTAL DEGREE HOURS REQUIRED FOR ASSOCIATE DEGREE: 71

### Civil Engineering Technology Curriculum (Construction Track)

First Semester		Second Semester	
CET 101 Elementary Surveying	4	CET 102 Advanced Surveying	4
GET 115 Computer Programming Fundamentals	3	CET 121 Materials, Properties and Testing	4
GET 121 Technical Drawing	3	CET 130 Construction Drawing	3
MAT 142A Algebra and Trigonometry	3	MAT 164A Analytical Geometry and Introductory Calculus	3
PHY 107 Basic Physics	4	PHY 108 Basic Physics	4
<b>TOTAL HOURS</b>	<b>17</b>	<b>TOTAL HOURS</b>	<b>18</b>
Third Semester		Fourth Semester	
CET 211 Structural Mechanics	4	CET 212 Structural Design	4
CET 222 Construction Materials	3	CET 231 Construction Technology	3
CET 226 Principles of Construction Estimating and Scheduling	3	CET 232 Civil Works Technology	3
ENG 101A Critical Written Expression	3	CET 240 Civil Management Technology	3
MAT 246A Introductory Calculus	4	SPE 101A Oral Communications	3
<b>TOTAL HOURS</b>	<b>17</b>	Humanities/Social Science Elective	3
		<b>TOTAL HOURS</b>	<b>19</b>

TOTAL DEGREE HOURS REQUIRED FOR ASSOCIATE DEGREE: 71



## Construction Management Technology

The Bachelor of Science Degree program in Construction Management Technology was implemented in the Fall of 1988. The first two years of study is the Civil Engineering Technology Construction Track (see description above). The second two years of study provide

a solid background in construction management, accounting, and economics. The program will prepare graduates for construction management positions in building and heavy construction in the employ of contracting firms, engineering and/or architectural firms, and departments in private industry having responsibilities for planning and/or managing construction.

### Construction Management Technology Curriculum

The first four semesters consist of the Civil Engineering Technology Construction Track Curriculum shown above.

Fifth Semester	
BUA 201 Principles of Accounting I	3
CET 310 General Architectural Design Technology	3
ECO 110 Introduction to Economics	3
ENG 317 Technical Writing	3
PSY 100 General Psychology	3
<b>TOTAL HOURS</b>	<b>15</b>

Sixth Semester	
BUA 202 Principles of Accounting II	3
EET 210 Circuits, Machines and Electronics	4
MAT 369A Applied Statistics for Engineering Technology	3
Technical Elective	3
Humanities/Social Science Elective	3
<b>TOTAL HOURS</b>	<b>16</b>

Seventh Semester	
BUA 330 Personnel Management and Industrial Relations	3
CET 420 Construction Materials, Methods, and Equipment	3
CET 430 Project Organization, Supervision and Management	3
CET 442 Contract Plans, Specifications and Shop Drawings	3
GET 484A Engineering Economics	3
Technical Elective	3
<b>TOTAL HOURS</b>	<b>18</b>

Eighth Semester	
BUA 325 Principles of Management and Organization	3
CET 440 Computer Applications in Construction Management	3
CET 450 Construction Productivity Economics	3
POS 103 State and Local Government	3
SPC 257 Business and Professional Communication	3
Technical Elective	3
<b>TOTAL HOURS</b>	<b>18</b>

**TOTAL DEGREE HOURS REQUIRED FOR BACCALAUREATE DEGREE: 138**

*STUDENT MUST SEE ADVISOR FOR APPROVAL OF ALL ELECTIVES*

Lists of approved Humanities and Technical Electives are available in 221 East Annex.

## Electrical Engineering Technology

This curriculum is designed to provide a strong background in the fundamentals, and a broad exposure to a variety of subject areas in the electrical field. Based on solid preparation in circuit analysis, mathematics, physics, and computer techniques, the student will take applied courses in digital and linear electronics, com-

munications, microprocessors, power systems and control systems. All EET courses have a strong practical orientation, and nearly all courses are supplemented with hands-on laboratory experience. Subject matter is generally similar to that covered in the electrical engineering curriculum, with less emphasis on mathematical and theoretical rigor, and a greater bend to the applied.

Electrical engineering technology graduates are intended to fill a niche between the technician and the design engineer; graduates find professional entry-level positions in the production engineering, manufacturing engineering, field engineering, test engineering, and quality control fields, as well as related areas, in such firms as public utilities, paper mills, electronics manufacturers, etc. Students

enter the bachelor of science program upon admission; after successful completion of the first four semesters, the student may elect to receive the associate of science degree. Both degree programs are fully accredited by the Technology Accreditation Commission of the Accreditation Board for Engineering and Technology.

### Electrical Engineering Technology Curriculum

First Semester		Second Semester	
EET 111 Circuit Analysis I	5	EET 112 Circuit Analysis II	5
ENG 101A Critical Written Expression	3	GET 121 Technical Drawing	3
COS 100 Introduction to Personal Computers	3	MAT 164A Analytical Geometry and Introductory Calculus	3
MAT 142A Algebra and Trigonometry	3	PHY 108 Basic Physics Humanities/Social Science Elective*	4
PHY 107 Basic Physics	4		3
<b>TOTAL HOURS</b>	<b>18</b>	<b>TOTAL HOURS</b>	<b>18</b>
Third Semester		Fourth Semester	
COS 215 Introduction to Computing Using FORTRAN	3	EET 242 Linear Electronics II	4
OR		EET 252 Electrical Projects	2
COS 220 Introduction to Computer Science I	(3)	EET 274 Introduction to Microcomputers	4
EET 241 Linear Electronics I	4	EET 282 Electronic Communications	4
EET 271 Digital Electronics I	4	ENG 105A Business, Professional and Technical Writing	3
MAT 246A Introductory Calculus	4	<b>TOTAL HOURS</b>	<b>17</b>
SPE 101A Oral Communications	3		
<b>TOTAL HOURS</b>	<b>18</b>		
<b>TOTAL DEGREE HOURS REQUIRED FOR ASSOCIATE DEGREE: 70</b>			
Fifth Semester		Sixth Semester	
EET 321 Electrical Machinery	4	EET 312 Linear Systems I	3
EET 341 Analog Integrated Circuits	4	EET 322 Power Systems I	4
EET 372 Digital Electronics II	4	EET 475 Microcomputer Applications	4
MAT 368A Ordinary Differential Equations	3	MAT 369A Applied Statistics for Engineering Technology	3
Free Elective	3	Humanities/Social Science Elective*	3
<b>TOTAL HOURS</b>	<b>18</b>	<b>TOTAL HOURS</b>	<b>17</b>

Seventh Semester		Eighth Semester	
EET 423 Power Systems II	3	GET 484 Engineering Economics	3
EET 425 Linear Systems II	3	Technical Elective*	3
MET 233 Thermal Science	3	Technical Elective*	3
Technical Elective*	3	Humanities/Social Science Elective*	3
Humanities/Social Science Elective*	3	Humanities/Social Science Elective*	3
<b>TOTAL HOURS</b>	<b>15</b>	<b>TOTAL HOURS</b>	<b>15</b>

**TOTAL CREDIT HOURS REQUIRED FOR BACCALAUREATE DEGREE: 135**

\*Electives are subject to approval.

## Mechanical Engineering Technology

The field of mechanical engineering technology includes mechanical design, manufacturing processes, energy utilization, such as power generation and heating or air conditioning buildings, and the economics of these activities.

Graduates work in a wide range of careers including product development, design, testing, manufacturing, operation and maintenance, marketing, sales and administration.

Classes emphasize applied engineering and

are supplemented by extensive laboratory experience. Students enroll in a four year program leading to a Bachelor of Science degree in Mechanical Engineering Technology. Students may elect at the end of the sophomore year to receive an associate degree in mechanical engineering technology. Students are urged to obtain technical employment during each summer recess.

## Mechanical Engineering Technology Curriculum

First Semester		Second Semester	
MAT 142A Algebra and Trigonometry	3	MET 107 Machine Tool Laboratory I	3
ENG 101A Critical Written Expression	3	SPE 101A Oral Communications	3
PHY 107 Basic Physics	4	MAT 164A Analytical Geometry and Introductory Calculus	3
GET 121 Technical Drawing	3	PHY 108 Basic Physics	4
GET 115 Computer Programming Fundamentals	3	GET 126 Machine Drawing	3
<b>TOTAL HOURS</b>	<b>16</b>	MET 150 Statics	3
		<b>TOTAL HOURS</b>	<b>19</b>
Third Semester		Fourth Semester	
MAT 246A Introductory Calculus	4	EET 210 Circuits, Machines and Electronics	4
INT 211 Machine Tool Laboratory II and Welding	2	MET 212 Machine Tool Laboratory III & Introduction to CAM	2
MET 219 Strength of Materials	3	MET 234 Mechanical Technology Laboratory I	3
MET 217 Dynamics	3	MET 236 Thermal Applications	3
MET 233 Thermal Science	3	MET 261 Design I	3
MET 270 Manufacturing Technology	3	Humanities/Social Science Elective	3
<b>TOTAL HOURS</b>	<b>18</b>	<b>TOTAL HOURS</b>	<b>18</b>

**TOTAL CREDIT HOURS REQUIRED FOR ASSOCIATE DEGREE: 71**

Fifth Semester	
CHY 111 General Chemistry	4
MET 335 Mechanical Technology Laboratory II	3
MET 355 Engineering Materials	3
ENG 317 Technical Writing	3
Technical Elective	3
<b>TOTAL HOURS</b>	<b>16</b>

Seventh Semester	
MET 462 Design II	4
MET 471 Mechanical Technology Laboratory III	3
GET 484 Engineering Economics	3
Technical Elective	3
Humanities/Social Science Elective	3
<b>TOTAL HOURS</b>	<b>16</b>

Sixth Semester	
MAT 368A Ordinary Differential Equations	3
MET 325 Fluid Flow Technology	3
MET 357 Kinematics of Mechanisms	3
Technical Elective	3
Humanities/Social Science Elective	3
<b>TOTAL HOURS</b>	<b>15</b>

Eighth Semester	
MET 463 Design III	3
Technical Elective	3
Humanities/Social Sciences Elective	3
Humanities/Social Sciences Elective	3
Free Elective	3
<b>TOTAL HOURS</b>	<b>15</b>

TOTAL CREDIT HOURS REQUIRED FOR BACCALAUREATE DEGREE: 132

## Courses in Engineering Technology

### CET 101 Elementary Surveying

Surveying instruments and their use in the measurement of angles and distances. The methods and computations used for control, topographic and engineering surveys. Preparation of topographic maps, profile and cross section sheets. Corequisite: MAT142A. Lec 3, Lab 3. **Cr 4.**

### CET 102 Advanced Surveying

Advanced instrument theory; introduction to photogrammetry; introduction to boundary surveying; subdivision computations and layout; higher-order control surveying; state plane coordinates; construction surveying. Prerequisites: CET 101 and MAT142A. Lec 3, Lab 3. **Cr 4.**

### CET 104 Plane Surveying

The use of surveying instruments and the various methods and computations used for plane surveying. Course is for forestry technology and agricultural mechanization technology students only. Prerequisite: MAT142A or equivalent. Lec 2, Lab 3. **Cr 3.**

### CET 121 Materials Properties and Testing

The study and testing of the properties of materials (timber, steel, asphalt, concrete, and aggregates) used in civil engineering construction. Also, an introduction to elementary statistics as it relates to the evaluation of data from the tests

of construction materials. Prerequisite: PHY 107. Lec 3, Lab 2. **Cr 4.**

### CET 130 Construction Drawing

A study of basic building structural systems, materials, and methods, and the graphical representation of same in the most customary forms of construction drawings as prepared by architects, engineers, and contractors. Lec 2, Lab 2. **Cr 3.**

### CET 211 Structural Mechanics

Analytical solutions of force systems. Load, shear, moment and deflection values are solved for in beams, trusses, and frames under static loading. Studies of stresses and strains that occur as structural members are subjected to shearing, tensile, compressive and flexural forces. Prerequisite: PHY 107, GET 115 or equivalent. Lec 4. **Cr 4.**

### CET 212 Structural Design

Fundamental analysis and design of beams and columns in steel, wood and concrete. Current design codes and practices are used. Prerequisite: CET 211. Lec 3, Lab 2. **Cr 4.**

### CET 220 Selected Topics in Civil Engineering Technology

Topics in Engineering Technology not regularly covered in other courses. The content is varied to suit individual needs. The course may be taken more than once. Prerequisite: consent of the instructor. **Cr 1-4.**

**CET 222 Construction Materials**

A continuation in the study of the properties of materials used in civil engineering construction. The emphasis is on soils including index properties, classification systems, moisture, drainage, frost action, and site investigations. Prerequisite: CET 121. Lec 2, Lab 2. Cr 3.

**CET 226 Principles of Construction Estimating and Scheduling**

Principles and application of construction cost estimating and construction scheduling (CPM). Prerequisite: GET 130. Lec 3. Cr 3.

**CET 231 Construction Technology**

The construction technologist at the production management level of the construction industry: equipment utilization and costs, temporary structures, construction systems, formwork design and construction inspection. Prerequisite or corequisite: CET 212. Lec 3, Lab 2. Cr 3.

**CET 232 Civil Works Technology**

The study of topics related to civil engineering site work, highway engineering, drainage, heavy construction and public works. Topics include: roadway design and construction, earthwork for heavy construction, hydraulics and the flow of liquids in pipes and open channels for simple drainage systems and sewers, construction of utilities, and public works operations. Prerequisite: CET 102 and CET 226, or permission. Lec 2, Lab 3. Cr 3.

**CET 240 Civil Management Technology**

Office aspect of civil engineering management. Basics of contract law. Writing specifications for a contract and interpreting specifications for inspection. Professional ethics, arbitration and the engineer as an expert witness. Distinguishing relationships in partnerships and corporations. Lec 3. Cr 3.

**CET 310 General Architectural Design Technology**

A study of the Owner-Designer-Builder relationships and their involvement and responsibilities during the various phases and activities associated with the evolution and construction of major building projects. Prerequisites: CET 240, CET 226. Lec 3. Cr 3.

**CET 420 Construction Materials, Methods and Equipment**

A study of the materials, methods, and equipment employed in the performance of construction work. Prerequisites: CET 130, CET 231. Lec 3. Cr 3.

**CET 430 Project Organization, Supervision and Management**

A study of forms of organization and principles of construction projects supervision and management. Prerequisites: CET 231, CET 240. Lec 3. Cr 3.

**CET 440 Computer Applications in Construction Management**

The use of programs for microcomputers for database management, spreadsheet analysis, and project management. Prerequisite: GET 115; Corequisite: CET 450. Lec 2, Lab 2. Cr 3.

**CET 442 Contract Drawings, Specifications and Shop Drawings**

A study of the technical documents which govern the work of construction projects. Prerequisites: CET 130, CET 240. Lec 3. Cr 3.

**CET 450 Construction Economics and Productivity**

A study of financial aspects and productivity related to construction projects. Prerequisites: CET 226, CET 231, CET 240. Lec 3. Cr 3.

**EET 111 Circuit Analysis I**

A non-calculus based introduction to elementary circuit analysis techniques as applied to d-c networks. The basic laws and theorems used in linear circuit analysis. Laboratory will provide an opportunity to verify the theory and will stress the proper use of d-c instruments. Corequisite: MAT142A. Lec 2, Rec 6, Lab 3. Cr 5.

**EET 112 Circuit Analysis II**

Continuation of EET 111. A non-calculus introduction to a-c circuits, including the study of reactive components and the application of phasor analysis to singlephase and polyphase a-c circuits in the steady state. Prerequisite: EET 111. Corequisite: MAT164A. Lec 3, Rec 3, Lab 3. Cr 5.

**EET 172 Computer Methods in Electrical Engineering Technology**

The application of the digital computer to problems in Electrical Engineering Technology will be stressed. The student will learn to program a computer using a high-level programming language such as FORTRAN or BASIC. Prerequisite: none. Corequisites: MAT142A and EET 111. Lec 3. Cr 3.

**EET 210 Circuits, Machines, and Electronics**

Electrical concepts and devices, elementary circuit analysis; fundamentals of AC and DC machinery; principles of electronic devices and circuits. For non-EET majors. Prerequisite:

PHY 107. Corequisite: MAT164A. Lec 3, Comp or Lab 3. Cr 4.

**EET 231 Techniques of Electrical Measurement**

The theory and operation of both basic and sophisticated measuring devices and equipment. Prerequisite: EET 112. Lec 2, Lab 3.

Cr 3.

**EET 241 Linear Electronics I**

Principles of operation of semiconductor diodes, transistors, and FETs. Applications to rectifier and filter circuits. D-c analysis and design of transistor and FET amplifiers; a-c analysis and design of transistor amplifiers. Prerequisite: EET 112. Lec 3, Lab 3.

Cr 4.

**EET 242 Linear Electronics II**

Applications and extensions of the material covered in Linear Electronics I. Amplifier frequency analysis, power amplifiers, PNP devices, linear integrated circuits, voltage regulators, feedback and oscillators are covered. Prerequisite: EET 241. Lec 3, Lab 3.

Cr 4.

**EET 252 Electrical Projects**

Instruction and practice in electronic construction, soldering, printed circuit board layout, and troubleshooting. Lab 6.

Cr 2.

**EET 261 Engineering Materials**

Physical and electrical properties of materials used in electrical equipment and electronic devices. Emphasis on electrical insulation, semiconductor materials, and magnetic materials. Lec 3.

Cr 3.

**EET 271 Digital Electronics I**

Introductory course in digital electronics. Logical design and analysis, using Boolean algebra, Karnaugh maps, Quine-McCluskey procedures, etc. as applied to combinational logic circuits. Elementary concepts of sequential logic circuit analysis and synthesis will be introduced. Lec 3, Lab 3.

Cr 4.

**EET 274 Introduction to Microcomputers**

Introduction to the programming of the microcomputer in machine and assembly language. The basic architecture of the microcomputer is introduced, including microprocessors, registers, control units, memory and I/O. Prerequisite: COS 100. Corequisite: COS 220 or COS 215. Lec 3, Lab 3.

Cr 4.

**EET 282 Electronic Communications**

Fundamentals of communications electronics circuits and systems, emphasizing modulation and detection, transmitters and receivers, transmission lines, multiplexing, pulse sys-

tems, and data communications. Prerequisite: EET 241, MAT246A. Lec 3, Lab 3.

Cr 4.

**EET 312 Linear Systems I**

A rigorous treatment of waveform analysis, voltage-current relationships of circuit components, the basic time domain circuit, circuit analysis by Laplace transforms, and system considerations. Prerequisites: EET 112, MAT 368. Lec 3.

Cr 3.

**EET 321 Electrical Machinery**

Theory, performance characteristics and basic operational control of DC and AC machines. Basic theory and application of power transformers. Introduction to per-phase and per-unit analysis. Prerequisite: EET 112. Corequisite: MAT 368. Lec 3, Lab 3.

Cr 4.

**EET 322 Power Systems I**

Control of AC and DC motors, including programmable controllers. Industrial solid state electronics, including theory and application of four layer devices, and transducers used as control devices. Design of open loop control systems. Three phase circuit analysis and analysis of power system networks by matrix algebra. Introduction to symmetric components. Prerequisite: EET 321. Lec 3, Lab/Rec 3.

Cr 4.

**EET 341 Analog Integrated Circuits**

Operational amplifiers and their characteristics and applications emphasized. Voltage regulators, active filters, A to D converters, phase-locked loops, multipliers and timers are also covered. Prerequisite: EET 242. Lec 3, Lab 3.

Cr 4.

**EET 372 Digital Electronics II**

Digital electronics theory and application; emphasis on sequential circuit analysis and synthesis. Asynchronous and synchronous circuits. Circuits encountered in computer and other digital applications introduced. Prerequisite: EET 271. Lec 3, Lab 3.

Cr 4.

**EET 423 Power Systems II**

Electric power systems, transmission lines, circuit constants, per-unit values, fault analysis, stability studies, principles of load flow control. Prerequisite: EET 322. Lec 3.

Cr 3.

**EET 425 Linear Systems II**

Introduction to servomechanism theory and practical design, system performance and comparison. Prerequisite: EET 312. Lec 3.

Cr 3.

**EET 428 Power Distribution, Illumination and Acoustics**

Distribution of electric power to load centers,

losses, voltage regulation, power factor correction. General illumination theory; elementary acoustic theory. Prerequisite: EET 112. Lec 3, Rec 4 or Lab 3. Cr 4.

#### **EET 468 Engineering Management**

Management techniques in industrial organizations, capitalization and amortization, planning techniques, time value of money. Lec 3. Cr 3.

#### **EET 475 Microcomputer Applications**

A continuation of EET274. Emphasis on the application of the microcomputer to problems in engineering technology. Applications include A/D and D/A conversion, interfacing, and the problems encountered in writing supervisory programs. Prerequisites: EET 274 and EET 372. Lec 3, Lab 3. Cr 4.

#### **EET 498 Selected Topics in Electrical Engineering Technology**

Topics in engineering technology not regularly covered in other courses. Content is varied to suit the needs of individuals. The course may be taken more than once. Prerequisite: permission of instructor. Cr 1-4.

#### **GET 105 Forestry Drawing**

An introduction to the basic graphical construction techniques, orthographic projection and cartography. Lec and Lab 4. Cr 3.

#### **GET 115 Computer Programming Fundamentals**

Introduction to digital computer programming using BASIC language, to numerical solution methods applicable to engineering technology problems and using the computer to create technical reports supplemented with analysis aids such as spreadsheets and graphs. Corequisite: MAT142A. Lec 2, Rec 1. Cr 3.

#### **GET 121 Technical Drawing**

An introduction to graphic symbols and skills applied to engineering drawings. Topics include: lettering, geometric construction, multi-view drawing, sections, graphs, dimensioning, and pictorial drawing. Lec 2, Lab 2. Cr 3.

#### **GET 126 Machine Drawing**

Preparation of complete working drawings of a project for MET 211 Machine Tool Lab II. Topics include: pictorial drawings, descriptive geometry, introduction to CADD, design process, dimensioning, tolerancing, fasteners, details, and assembly drawings. Prerequisite: GET 121. Lec and Lab 4. Cr 3.

#### **GET 132 Surveying Graphics**

The theory of graphics applied to surveying

and mapping, including boundary, highway, site, and layout plans, map projections, topographic maps, and computer graphics. Prerequisite: GET 121. Lec and Lab 4. Cr 3.

#### **GET 227 Descriptive Geometry**

The solutions of problems of a three-dimensional nature by applying graphical methods. Theoretical and applied problems related to engineering technology. Prerequisite: GET 121. Lec and Lab 3. Cr 2.

#### **GET 351 Computer-Aided Design and Drafting I**

Introduction to commercial CADD systems, especially microcomputer graphics hardware and software. Application of CADD software to create graphic designs and solve graphic problems. Use of a turnkey CADD system. Prerequisite: GET 115 and GET 121. Lec 2, Lab 2. Cr 3.

#### **GET 484 Engineering Economics**

Economic applications in engineering and industrial organizations; capitalization and amortization, planning techniques, time value of money, cost analysis, and computer modeling. Prerequisite: Senior standing in SET or permission of the instructor. Lec 3. Cr 3.

#### **GET 485 Technology Management Practice**

Theory and application of management principles as practiced by technical managers in industrial or institutional organizations. Behavioral and quantitative techniques, network analysis, operations control, and social responsibility are emphasized. Prerequisite: Senior standing in SET or permission of instructor. Lec 3. Cr 3.

#### **CHY 110A Principles of Chemistry**

A survey of major topics in general chemistry. Descriptive and qualitative approaches are used to develop an understanding of chemical principles. Quantitative relationships that strengthen the principles covered emphasized. Provides a strong foundation for subsequent work in chemistry courses. Lec 3, Lab 3. Cr 4.

#### **MAT 142A Algebra and Trigonometry**

Algebra and trigonometry, including factoring and fractions, exponents and radicals, linear, quadratic, and fractional equations and inequalities, graphs and functions, linear, quadratic, rational, higher degree and trigonometric functions and solutions to triangles. Prerequisite: Engineering Technology students. Cr 3.

**MAT 164A Analytical Geometry and Introductory Calculus**

Trigonometric identities and equations, inverse trigonometric functions, exponential and logarithmic function, matrix algebra, determinants, progression, elements of analytic geometry including conic sections, polar coordinates, and introductory calculus including derivative and its applications. Prerequisite: MAT142A. Cr 3.

**MAT 246A Introductory Calculus**

A basic course concerned with the fundamental concepts and applications of the derivative, an introduction to integration and its applications, derivatives of transcendental functions and a variety of integration techniques. Prerequisite: MAT164A. Cr 4.

**MAT 368A Ordinary Differential Equations**

An introduction to ordinary differential equations and their applications. A brief introduction to partial differential equations. Prerequisite: MAT246A. Rec 3. Cr 3.

**MAT 369A Applied Statistics for Engineering Technology**

Basic concepts of probability and probability distributions, such as Gaussian distribution and the Poisson distribution. Emphasis on applications to engineering technology. Mathematical expectation, decision making, quality control, random processes and Monte Carlo methods discussed. Inferences concerning means, variance, and proportions. Prerequisite: MAT246A or its equivalent. Cr 3.

**PHY 107 Basic Physics**

An introduction to the basic concepts of mechanics, sound and heat with illustrations taken from technical applications. Calculus is not used. Lec 2, Rec 1, Workshop 1, Lab 2. Cr 4.

**PHY 108 Basic Physics**

An introduction to the basic concepts of electricity, magnetism and light with illustrations taken from technical applications. Calculus is not used. Prerequisite: PHY 107. Lec 2, Rec 1, Lab 2. Cr 4.

**MET 105 Heat Treatment**

Modern ferrous metal heat treating operations and the basic principles underlying them. Analysis of the effects of thermal and mechanical operations on microstructure and attendant mechanical properties. Prerequisites: MET 107, MET 219. Rec 1, Lab 2. Cr 2.

**MET 107 Machine Tool Laboratory I**

Theory and application of fundamental metal removing processes. Basic metrology and tool

nomenclature. (MET majors only). Rec 1, Lab 4. Cr 3.

**MET 109 Machine Shop and Welding**

Fundamental bench work and light machine work using drill presses, lathes, milling machines, shapers and surface grinders. Lab 4. Cr 2.

**MET 110 Principles of Production Processes**

The function of basic metal working machine tools in diversified manufacturing operations. Applications to maintenance, service, research, and industrial support. Lec and Lab 3. Cr 3.

**MET 150 Statics**

The study of forces, systems, particles and rigid bodies in equilibrium, trusses, centroids and centers of gravity, properties of area and friction. Prerequisites: MAT142A, PHY 107, and GET 121. Rec 3. Cr 3.

**MET 212 Machine Tool Laboratory III and Introduction to CAM**

Completion and evaluation of prototype assembly. Introduction to computer aided manufacturing. Prerequisites: INT 211. Lab 3. Cr 2.

**MET 217 Dynamics**

A study of kinematics and kinetics of particles and rigid bodies, including work and energy, impulse and momentum. Prerequisite: MET 150 or CET 211 and MAT164A. Cr 3.

**MET 219 Strength of Materials**

Stress and strain in materials and bodies subject to tension, compression, torsion, and flexure. Deflection of prismatic members; columns; combined stresses. Prerequisite: MET 150 and MAT164A. Rec 3. Cr 3.

**MET 220 Selected Topics in Mechanical Engineering Technology I**

Topics in engineering technology not regularly covered in other courses. Content is varied to suit the needs of individuals. May be taken more than once. Prerequisite: consent of the instructor. Cr 1-3.

**MET 233 Thermal Science**

Elementary thermodynamics. Engineering calculations relative to heat, power, work and mechanical and electrical energy. Prerequisite: PHY 108. Rec 3. Cr 3.

**MET 234 Mechanical Technology Laboratory I**

Experimental application of solid and fluid mechanics, and thermodynamics. Calibration of laboratory instruments. Prerequisite: MET 233 and MET 219. Rec 2, Lab 4. Cr 3.



**MET 236 Thermal Applications**

Applications of fundamentals studied in MET 233. Steam and gas cycles, analysis of cycle components, steam generators, pumps, turbines, compressors, heat transfer and refrigeration systems. Prerequisite: MET 233. Rec 3.

Cr 3.

**MET 261 Design I**

A continuation of strength of materials as applied to design. Theories of failure; factors of safety; and design of mechanical components including design calculations for shafts, couplings, bearings, gears, belts, clutches, brakes, springs, and bolted joints. Prerequisite: MET 219. Rec 3.

Cr 3.

**MET 270 Manufacturing Technology**

Production processes and problems to include: process planning, automation, numerical control, quality control, specialized machine tools and current advances in the field of metal working. Prerequisites: MET 107 and sophomore standing. Rec 3.

Cr 3.

**MET 318 Statics and Strength of Materials**

The Basic Principles of statics and their application in strength of materials; force systems, equilibrium, trusses, and friction. Stresses and deformations in axially loaded members, beams, circular shafts and columns. Prerequisite: PHY 107, PHY 108, Junior/Senior standing in B/EET or permission. Rec 3.

Cr 3.

**MET 320 Selected Topics in Mechanical Engineering Technology II**

Topics in engineering technology not regularly covered in other courses. Content is varied to suit the needs of individuals. May be taken more than once. Prerequisite: consent of the instructor.

Cr 1-3.

**MET 325 Fluid Flow Technology**

Fluid statics, dynamics and energy; flow measuring devices, fluid components and systems. Prerequisite: MET 317, MET 236. Rec 3.

Cr 3.

**MET 331 Digital Computation in Mechanical Engineering Technology**

Computer programming using Fortran language. Applications to mathematical and technical problems. Prerequisite: MAT246A. Rec 3.

Cr 3.

**MET 335 Mechanical Technology Laboratory II**

An introduction to instrumentation, data analysis, and laboratory techniques. Applications to heat power, mechanical processes, and

fluid mechanics. Prerequisite: MET 234. Rec 1, Lab 3.

Cr 3.

**MET 339 Power Plant Technology**

Heat power systems including steam, internal combustion engines, turbines, pumps, compressors, basic design features, power station technology and economics. Prerequisite: MET 236. Rec 3.

Cr 3.

**MET 340 Heat Transfer**

Energy transfer by conduction, convection, and radiation. One-and-two-dimensional steady state conduction processes in solids by use of exact solutions, shape factors, and finite differences. Use of charts for certain one-dimensional transients. Electric network method for radiation analysis. Experimental correlations for convection problems. Steady state heat exchanger performance. Prerequisite: MAT246A and MET 233, MET 236. Rec 3.

Cr 3.

**MET 355 Engineering Materials**

The study of the composition and behavior of materials used in engineering. Materials covered include metals, plastics, wood, ceramics, and concrete. The laboratory demonstrates the effect of heat treatment on the mechanical properties of steels. Prerequisites: CHY 111, MET 219, MET majors and junior standing. Rec 2, Lab 2.

Cr 3.

**MET 357 Kinematics of Mechanisms**

The study of motion, instant centers and linkages in mechanisms, cams, gears, and gear trains. Prerequisites: MET 317, MET 261. Rec 3.

Cr 3.

**MET 360 Statistical Quality Control**

The basics of statistical quality control for variables and attributes. Content includes process capability, control charts, sampling plans, reliability and quality costs. In the laboratory actual parts are measured and the appropriate statistical studies and charts are made. Visits to local plants are made to witness actual production results. Prerequisites: MAT246A, MET 212, MET 270. Rec 2, Lab 2.

Cr 3.

**MET 391 Heating, Ventilating and Air Conditioning**

Determination of heating, ventilating and air conditioning loads for buildings and industrial processes. Heat transfer devices and applications to systems. Refrigeration for controlled-temperature applications. Heating, ventilating and air conditioning system layout and control systems. Prerequisite: MET 236. Rec 3.

Cr 3.

**MET 393 Internal Combustion Engines**

Application of thermodynamics laws and principles to internal combustion engine cycles, theory of design and operation; fuels and combustion, carburetion, detonation, cooling, and lubrication. Prerequisite: MET 236, MET 325. Rec 3. Cr 3.

**MET 394 Mechanical Engineering Technology Practice**

Cooperative work experience in mechanical engineering technology at full-time employment for at least a ten-week period. Prerequisite: Junior or Senior standing. Cr 3.

**MET 450 Experimental Mechanics**

Experimental methods and techniques for analysis of stress, strain, and displacement and their engineering significance. Electric strain gages, brittle lacquers, mechanical and optical strain gages, and introduction to photoelasticity. Prerequisite: MET 261. Rec 2, Lab 3. Cr 3.

**MET 451 Experimental Mechanics II**

Experimental methods and techniques for analysis of stress, strain and motion. Dynamic strain measurement, motion measurement using a reference, Seismic systems, and photoelasticity. Prerequisite: MET 450. Rec 2, Lab 2. Cr 3.

**MET 462 Design II**

Analysis of mechanical elements. Applications

of mechanics of materials, stress concentration, combined stresses, fatigue, and factor of safety to the design of machine components. Prerequisite: MET 261 and senior standing. Rec 3, Comp 2. Cr 4.

**MET 463 Design III**

Continuation of Design II. Drive components, welded connections, lubrication, bearings, gearing, miscellaneous machine elements and engineering materials. Prerequisite: MET 462. Rec 3. Cr 3.

**MET 471 Mechanical Technology Laboratory III**

A project-oriented laboratory course in which the student is asked to solve technical problems similar to those encountered by technologists in industry. Prerequisite: MET 335 and Senior standing. Rec 1, Lab 3. Cr 3.

**Interdisciplinary Course****INT 211 (AEN, MET) Machine Tool Laboratory II and Welding**

Design and manufacture of prototype assembly. Advanced metrology. Welding principles and practice, including AC and DC stick welding, Oxy-fuel cutting and welding, and GTA/GMA with iron, steel and aluminum. Prerequisite: MET 107, GET 126. Lab 4. Cr 2.

## Surveying Engineering

Surveying engineers have a direct and substantial impact on the shaping and preservation of the physical environment in which we live. As society moves into an information age, surveying engineers are designing the automated systems and techniques for efficiently collecting and analyzing information about land and its resources. They play a key role in the protection of the environment and in the efficient utilization of the nation's natural resources. They also play a key role in the design and construction of the nation's housing developments, roads, utilities, buildings, and all other constructed facilities.

Earth-orbiting satellites and computers capable of handling very large data sets are now commonplace tools for surveying engineers. To meet a broad range of societal needs, surveying engineers record, analyze, communicate and manage information about land.

The surveying engineering program provides the technical training and analytic capabilities necessary for professional practice of surveying in its broadest sense. Included are the sub-disciplines of cartography, geodesy, engineering surveying, boundary surveying, land use planning, land information studies, photogrammetry, resource mapping, cadastral systems, hydrographic surveying and remote sensing.

Student candidates for the B. S. degree in Surveying Engineering are prepared for satisfying and challenging careers. Graduates are well equipped to carry out the computational and legal tasks associated with traditional sur-

veying and land development practice. Surveying engineers may also be involved in land information system design or may be involved in improving techniques for collecting, quantifying, and mapping physical information about the earth's surface. The program also provides an understanding of the legal, social, economic, and political mechanisms which affect the practice of surveying engineering.

Surveying engineers work everywhere from large cities to remote wilderness areas and from climate controlled offices to exposed outdoor settings. Some surveying engineers work for large international computer companies or large engineering consulting firms. Others chose to work in small towns, using their skills in modern measurement techniques to address local-level land data problems. Many graduates are self-employed as surveying, mapping, and land information system consultants. Other surveying engineers have gone to graduate school in law, business, or related engineering disciplines before beginning their careers.

The four-year curriculum leads to the basic degree of Bachelor of Science in Surveying Engineering and is fully accredited by the Engineering Accreditation Commission of the Accreditation Board of Engineering and Technology. Although the curriculum provides excellent preparation for an effective professional career, superior students are encouraged to elect additional courses and further their educations in the graduate program.

### Surveying Engineering Curriculum

#### Freshman Year

First Semester		Second Semester	
SVE 111 Plane Surveying	4	SVE 112 Advanced Plane Surveying	4
SVE 101 Introduction to Surveying	1	ENG 101 College Composition	3
MAT 126 Analytic Geometry and Calculus	4	MAT 127 Analytic Geometry and Calculus	4
CHY 113 Chemical Principles I (1)	4	PHY 121 Physics for Engineers and Physical Scientists I	4
ECO 120 Principles of Microeconomics	3	ECO 121 Principles of Macroeconomics or Humanities/Social Sciences Elective (2)	3
<b>TOTAL HOURS</b>	<b>16</b>	<b>TOTAL HOURS</b>	<b>18</b>

## Sophomore Year

First Semester		Second Semester	
SVE 221 Legal Aspects of Land Surveying	3	SVE 281 Advanced Computer Usage for Surveyors	3
MAT 228 Analytic Geometry and Calculus	4	SVE 321 Cadastral Systems	3
PHY 122 Physics for Engineers and Physical Scientists II	4	MAT 434 Introduction to Statistics	4
COS 220 Introduction to Computer Science I	3	MAT 258 Introduction to Differential Equations and Linear Algebra	4
SVE 271 Introduction to Geographic Information Systems	3	Humanities/Social Science Elective (2)	3
TOTAL HOURS	17	TOTAL HOURS	17

## Junior Year

First Semester		Second Semester	
SVE 361 Adjustment Computations	3	SVE 441 Geodetic Models	4
SVE 451 Engineering Databases	4	SVE 432 Advanced Photogrammetry	4
SVE 331 Photogrammetry	3	SVE 452 Geometry and Computer Graphics	4
GES 101 Aspects of the Natural Environment I		SVE 393 Junior Seminar	1
OR		ENG 317 Advanced Professional Exposition	3
GES 106 Geology for Engineers Humanities/Social Science Elective (2)	3	TOTAL HOURS	16
TOTAL HOURS	17		

## Senior Year

First Semester		Second Semester	
SVE 433 Remote Sensing	4	SVE 425 Land Development Design	4
ARE 473 Land Economics	3	SVE 493 Senior Seminar	1
Engineering Science/Design Elective	3	ARE 474 Land Use Planning	3
Engineering Science/Design Elective	3	Engineering Science/Design Elective	3
Humanities/Social Science Elective (2)	3	Free Elective (3)	4
TOTAL HOURS	16	TOTAL HOURS	15

MINIMUM CREDIT HOURS: 131

## Electives:

1. Other approved basic science electives may be substituted.
2. 18 credit hours of humanities and social sciences are required for graduation. Of the 18 required credits, it is required that the humanities program must contain at least one 9-hour sequence in a specific subject and that the sequence include at least two upper level courses.
3. Free electives are any technical or non-technical courses offered for credit by any academic unit of the University.

## Courses in Surveying Engineering

### SVE 101 Introduction to Surveying

An overview of the profession of surveying, re-tracement of the institutions of property and ownership; land survey and recording systems; professionalism; surveying in the United States; the present and future role of surveyors; the relationships between surveyors and users of surveying expertise. No prerequisite. Lec 1.

Cr 1.

### SVE 111 Plane Surveying

An elementary course presenting fundamental plane surveying concepts including: reference planes and surfaces, distance and angular measurement, traverse computations, horizontal and vertical curves, error propagation, area determination and stadia mapping. Prerequisite: trigonometry in high school. Lec 3, Lab 3.

Cr 4.

### SVE 112 Advanced Plane Surveying

A second course in plane surveying techniques which considers the subject areas of horizontal control networks, state plane coordinate systems, surveying, astronomy, earthwork computations and engineering surveys. Prerequisite: SVE 111, MAT 126. Lec 3, Lab 3.

Cr 4.

### SVE 221 Legal Aspects of Land Surveying

Property law, boundary law, conveyance of property, recording systems and procedures, interpretation and writing of land description. Prerequisite: SVE 111. Lec 3.

Cr 3.

### SVE 222 Land Surveying

Boundary law, U. S. public land system, subdivision layout and design permit requirements and procedures. Prerequisite: SVE 221. Lec 3.

Cr 3.

### SVE 271 Introduction to Geographic Information Systems

An introductory course covering traditional representation of spatial data and techniques for representing spatial data in digital form. The course combines an overview of general principles associated with the implementation of geographic information systems and practical experience in the analysis of geographic information. The course covers typical operations on spatial information and techniques for analyzing spatial information. Students will convert map data to digital form, perform coordinate transformations, and analysis. Re-

quires use of interactive workstations. Prerequisite: Sophomore standing. Lec 2, Lab 1.

Cr 3.

### SVE 281 Advanced Computer Usage for Surveyors

The first half of the course is an extensive introduction to operating systems using Digital equipment's VMS and system utilities and PASCAL programming on the VAX. Discussion of the file system and compilation processes, and software engineering tools. The second half of the course is an introduction to FORTRAN programming with applications in the area of matrix algebra, non-linear equations (iterative solutions), and other numerical aspects; examples are taken from photogrammetry and geodesy problems. Uses of systems libraries such as IMSL and Calcomp. Prerequisites: COS 220, MAT 127. Lec 3.

Cr 3.

### SVE 321 Cadastral Systems

The concepts of property, land tenure and land ethics; land registration systems; the function and design of multi-purpose cadastres; political, economical and social constraints of land information systems, introduction to management concepts. Prerequisite: sophomore standing. Lec 3.

Cr 3.

### SVE 331 Photogrammetry

Procedures and methods used for deriving metric information from photographs. Analogue processes for using aerial photographs in production of topographic maps. Flight planning and cost estimation in aerial mapping work. Introduction to photocoordinate measurement devices and their calibration. Prerequisite: SVE 111. Lec 2, Lab 3.

Cr 3.

### SVE 361 Adjustment Computations

Least squares adjustment as applied to surveying: Propagation of random errors, variance-covariance propagation; observation equation model; conditions between parameters, sequential solutions, observed parameters, minimal constraint solutions, statistical tests, laboratories. Some concepts from linear algebra and statistics reviewed. Prerequisite: MAT 258, MAT 262 or consent, SVE 281. Lec 3.

Cr 3.

### SVE 393 Junior Seminar

Selected topics of current interest within the surveying profession are discussed by outside speakers and enrolled students. Juniors in Surveying Engineering must research, prepare and present a topic of current interest to the group to receive credit. A paper is required. The

seminar is open to anyone who chooses to attend. Prerequisite: junior standing or permission. Lec 1. **Cr 0-1.**

#### **SVE 394 Field Practice**

Work experience in surveying engineering through the cooperative education program. Prerequisite: sophomore standing and 2.5 GPA. **Cr 3.**

#### **SVE 411 Hydrographic Surveying**

Concepts of hydrographic instruments operating from different types of marine platforms along with the planning and operational aspects of hydrographic surveys. Specific treatment will be made of measurement instruments for position, tidal control and depth; as well as magnetic, bottom, water and geological parameters. Prerequisites: SVE 112, MAT 228, SVE 441. Lec 3. **Cr 3.**

#### **SVE 425 Land Development Design**

A capstone design course which covers all phases of the land development process. Site evaluation includes consideration of boundary surveys, topographic surveys, control surveys, soil analysis, hydrographic analysis, traffic evaluation, plus environmental, aesthetic, and cultural considerations. Students design lot and building arrangements and design all streets, drainage channels, detention basins, culverts, and consider the layout of sanitary and storm sewers. Prerequisite: Senior standing in SVE or CIE with at least one of the following: SVE 112, CIE 350, CIE 455. Lec 3, Lab 3. **Cr 4.**

#### **SVE 432 Advanced Photogrammetry**

Advanced topics in metric photogrammetry. Advanced stereoscopic plotting instruments. Analytical methods in stereoplotter orientation. Aerial mapping control requirements. Creation of digital data bases. Design criteria in stereoscopic digital data collection. Photogrammetric control extension. Orthophotography. Prerequisite: SVE 331, SVE 361 or equivalent. Lec 3, Lab 3. **Cr 4.**

#### **SVE 433 Remote Sensing**

Definition and overview of remote sensing, sensors, signatures and information; electromagnetic radiation, interactive mechanisms; photographic systems, photometry and spectroradiometry; electro-optical sensors, non-imaging sensors, radar system; space platforms; information systems; processing; interpretation; application; practical utility of remotely sensed data; term project. Prerequisite: MAT 228, PHY 122. Lec 3, Lab 1. **Cr 4.**

#### **SVE 441 Geodetic Models**

Three dimensional geodesy, computations on the ellipsoid, conformal mapping. Geometric properties of ellipsoids, normal sections, geodesics, geodetic datum definitions, direct and inverse solutions as well adjusting networks on the ellipsoid, on the mapping plane and in space. Reduction of observations and elements of Physical Geodesy. Review of spherical trigonometry, differential geometry and complex variables as necessary. Prerequisite: MAT 228, SVE 111, SVE 281. Lec 3, Lab 1. **Cr 4.**

#### **SVE 451 Engineering Databases and Information Systems**

Develop a theoretical foundation for representation of knowledge in information systems. Logic based programming as a tool for fast prototyping and design of data structures. Database management systems and their suitability for engineering data. The structure of a network DBMS. Physical data storage and basic datastructures (list, tree, hashing). Transaction concept. Design of database scheme for engineering application. Prerequisite: COS 220 and SVE 281 or permission of instructor. Lec 3, Lab 1. **Cr 4.**

#### **SVE 452 Geometry and Computer Graphics**

Analytical geometry on computer systems. Representation of topological and metric properties of two dimensional geometric structures. Overview of raster based systems. Computer graphics hardware. Design of device independent programs for graphics output. Coordinate systems and transformation. Principles of effective visual communication and their application in e. g. cartography. The use of interactive engineering workstations. Prerequisite: SVE 451 or permission of instructor. Lec 3, Lab 1. **Cr 4.**

#### **SVE 493 Senior Seminar**

Presentations by students and faculty of pertinent happenings in surveying. Discussions based upon term projects, literature reviews, current events, or thesis topics. Professional practice and ethics are explored with members of the surveying community. Each participant prepares and moderates a seminar session. A paper is required. Prerequisite: senior standing or permission. Lec 1. **Cr 1.**

#### **SVE 496 Surveying Engineering Practice**

A course intended to apply theoretical concepts introduced in previous surveying, geodesy, photogrammetry and adjustments to the solution of comprehensive problems in surveying engineering. Emphasis will be on laboratory

work including field observations. Prerequisite: SVE 112, SVE 342, SVE 332, SVE 361. Lec 2, Lab 3. **Cr 3.**

#### **SVE 498 Selected Studies in Surveying Engineering**

Topics in surveying, photogrammetry, remote sensing, land information systems, and geodesy not covered in other courses. The content may be varied to suit current needs. The course may, with consent of the department, be taken for credit more than once. Prerequisite: permission of the instructor. **Cr 1-3.**

#### **SVE 499 Senior Thesis**

A required course by seniors in Surveying Engineering. Includes selecting an area of study with adviser approval, then performing a full literature search, conducting the necessary research and reporting results in thesis format. The thesis must meet University format requirements and be submitted in duplicate to the department. Prerequisite: senior standing. Lec 1. **Cr 3.**

#### **SVE 522 Environmental Law and Resource Regulation**

Selected topics in common law solutions to environmental problems, major statutes in air, water, solid waste, and coastal zone management, environmental litigation, land use controls, water rights. Prerequisite: Permission. Lec 3. **Cr 3.**

#### **SVE 531 Analytical Photogrammetry**

Optimization of data collection for control extension by photogrammetry, semianalytical and analytical methods of aerotriangulation, examination of reliability considerations in large blocks of aerial photographs, real-time and a posteriori blunder detection techniques, examining sparsity of equations in large blocks of photographs, recursive partitioning techniques, self-calibration in aerotriangulation, analytical applications in digital imagery, techniques in stereo-correlation. Prerequisite: SVE 361, SVE 432. Lec 3. **Cr 3.**

#### **SVE 532 Close Range Photogrammetry**

Network optimization in non-topographic mensuration, auxiliary constraints in photogrammetric adjustments, methods of calibration of close-range cameras, use and limitations of non-metric cameras, accident and crime scene reconstruction, applications in architecture, construction, industry, mining, biomedicine, X-ray photogrammetry, and scanning electron microscopy. Prerequisite: SVE 361, SVE 432. **Cr 3.**

#### **SVE 541 Satellite Geodesy**

Stellar coordinate systems, precession, nutation, time systems, troposphere, ionosphere; satellite orbital theory, Global Positioning System (GPS), space segment, correlating receivers and code-less receivers; pseudo ranges; single, double, and triple difference phase processing; point positioning, relative positioning; dual frequency processing; code smoothing techniques; positioning of moving platforms; simultaneous orbital and baseline estimation; GPS vector adjustments and combination with terrestrial observations; astronomical azimuth, latitude and longitude determination; proper motion, aberration, parallax; laboratories. Prerequisite: SVE 361. Lec 3. **Cr 3.**

#### **SVE 542 Integrated Geodesy**

Measurement of gravity and gravity gradients; gravimeters; reduction due to height, terrain, and tides; isostasy; normal gravity fields, geodetic reference systems; height systems, spirit leveling and gravity; elements of potential theory, spherical harmonic expansions of global fields such as geoid undulations, deflections of the vertical, gravity anomalies; Bruns, Stokes and Meinesz formulae; the integrated geodetic model; local geoid from GPS satellites and gravity. Prerequisite: SVE 361. Lec 3. **Cr 3.**

#### **SVE 551 Interactive Query Languages**

Types of interactive query languages; specific needs in Land Information System applications; transformation between the database conceptual schema and user views. Advanced topics (e. g. automatic name placement, generalization). Prerequisite: SVE 452. Lec 3. **Cr 3.**

#### **SVE 552 Interactive Land Information Systems**

Advanced course treating the interactive input and update of data in a Land Information System. Main topics will be the treatment of consistency constraints (including geometrical consistency constraints) and solution to a conceptual simple model of interaction with the user. Prerequisite: SVE 551. Lec 3. **Cr 3.**

#### **SVE 561 Advanced Adjustment Computations**

Condition equation model, mixed model, generalized inverses of matrices, inner constraint solutions; multi-dimensional normal distributions and confidence regions, generalized linear hypothesis testing; internal and external reliability of geodetic networks; blunder detection and data snooping; variance component estimation; deformation networks and

analysis; large systems (banded and patterned normal matrices, reordering), selected topics and laboratories. Prerequisite: SVE 361. Cr 3.

**SVE 598 Selected Studies in Surveying Engineering**

Topics in surveying, photogrammetry, remote sensing, land information systems and geodesy. The content may be varied to suit current needs. May be repeated for credit.

Cr 1-3.

