



The  
University  
of  
Vermont

Catalogue 1988-89

# CATALOGUE 1988-89

The University of Vermont  
Burlington, Vermont 05405

### **NOTICE OF NONDISCRIMINATION**

*Applicants for admission and employment, students, employees, sources of referral of applicants for admission and employment, and all unions or professional organizations holding collective bargaining or professional agreements with the University of Vermont are hereby notified that the University of Vermont does not discriminate on the basis of race, sex, sexual orientation, handicap, color, religion, age, national origin, or Vietnam Veteran status in admission or access to, or treatment or employment in, its programs and activities. In addition, it is the policy of the University that sexual harassment is unacceptable and will not be tolerated.*

*It is therefore the intent of the University to comply with the spirit and the letter of Titles VI and VII of the Civil Rights Act of 1964; Title IX of the Education Amendments of 1972; the Equal Pay Act of 1963; the Age Discrimination Act of 1974, Section 504 of the Rehabilitation Act of 1973; the Vermont Fair Employment Practices Act; and such other federal, state, and local non-discrimination laws as may apply.*

*Inquiries or complaints concerning the University's compliance with the regulations implementing the above-referenced laws, or the affirmative action policies of the University should be made to the University of Vermont Director, Office of Affirmative Action and Equal Opportunity, Waterman Building, Burlington, Vermont 05405, telephone (802) 656-3368; or the Office of the Vermont Attorney General, Pavillion Building, Montpelier, Vermont 05602. Inquiries or complaints concerning the University's compliance with the regulations implementing Title VI of the Civil Rights Act of 1964, 34 CFR Part 100; Title IX of the Education Amendments, 34 CFR Part 106; the Age Discrimination Act of 1975, 45 CFR Part 90; or Section 504 of the Rehabilitation Act of 1973, 34 CFR Part 104, may also be made to the Assistant Secretary for Civil Rights, United States Department of Education, Washington, DC 20202, or to the Director, United States Department of Education, Office of Civil Rights, Region I, J.W. McCormack POCH, Boston, MA 02109.*

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*Students at the University of Vermont are responsible for knowing and complying with all requirements for their respective degrees as stated in the catalogue.*

*The University of Vermont reserves the right to make changes in the course offerings, degree requirements, charges, and regulations, and procedures contained herein as educational and financial considerations require, subject to and consistent with established procedures and authorizations for making such changes.*

*Although its legal title is The University of Vermont and State Agricultural College, the University is known to its students and alumni as UVM. This popular abbreviation is derived from the Latin Universitas Viridis Montis, University of the Green Mountains.*

*The colors of the University are green and gold.  
The mascot is the catamount.*





# Academic Calendar

## FALL 1988

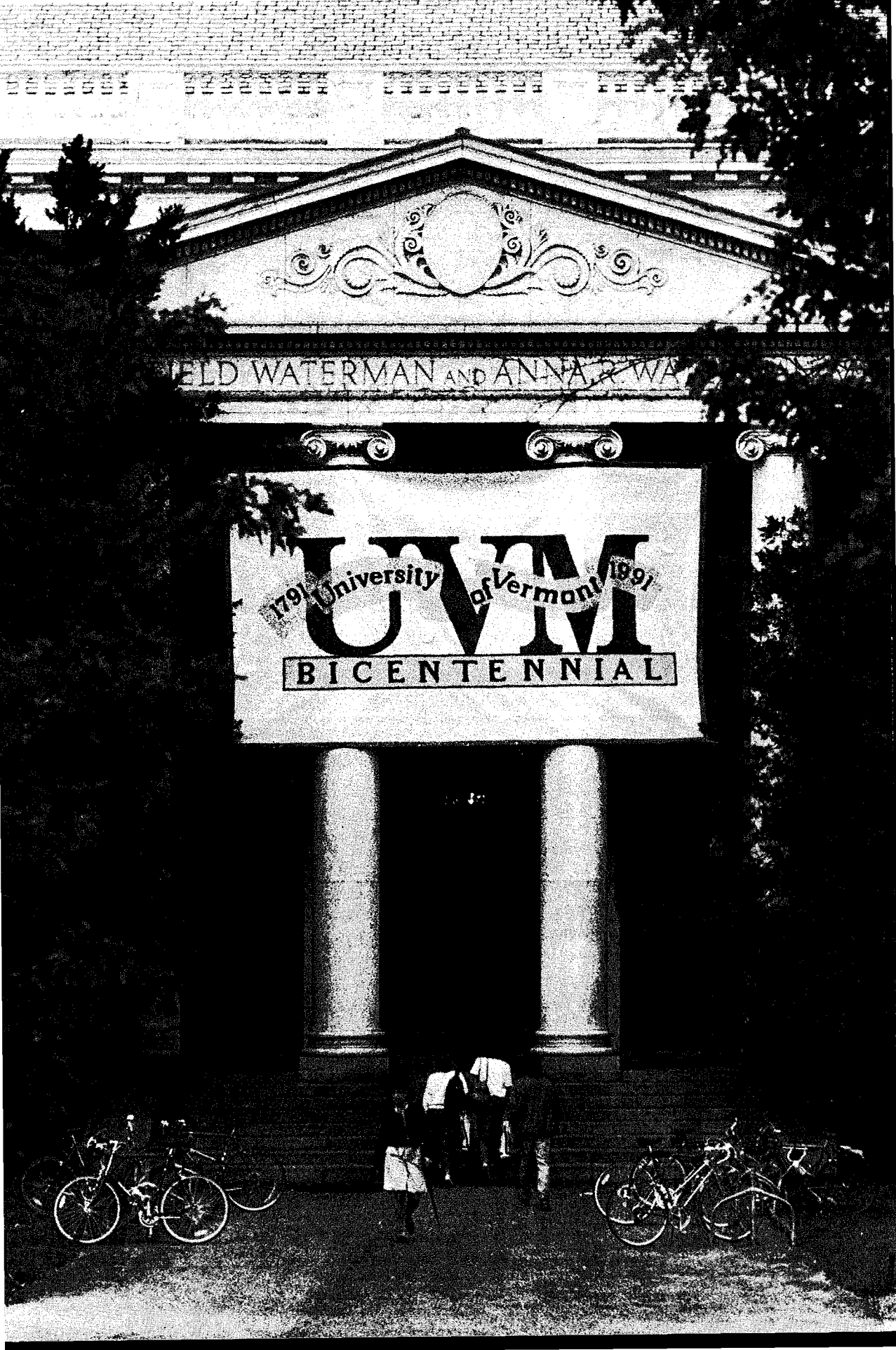
Registration	August 29	Monday
Classes begin	August 30	Tuesday
Labor Day	September 5	Monday
Fall recess	October 14	Friday
Preregistration	November 16-18	Wednesday-Friday
Thanksgiving recess	November 23-25	Wednesday-Friday
Classes end	December 9	Friday
Exams begin	December 12	Monday
Exams end	December 16	Friday

## SPRING 1989

Martin Luther King holiday	January 16	Monday
Registration	January 17	Tuesday
Classes begin	January 18	Wednesday
Washington's Birthday holiday	February 20	Monday
Town Meeting recess	March 7	Tuesday
Spring recess	March 20-24	Monday-Friday
Preregistration	April 19-21	Wednesday-Friday
Honors Day	April 24	Monday
Classes end	May 5	Friday
Exams begin	May 8	Monday
Exams end	May 12	Friday
Commencement	May 20	Saturday

For informational purposes, the major Jewish holidays which occur during the academic year are listed below. Classes will meet as scheduled. Students who miss work because of religious observance will be permitted to make this work up at another time.

Rosh Hashanah (New Year)	September 12-13	Monday-Tuesday
Yom Kippur (Atonement)	September 21	Wednesday
Succot (Tabernacles, Beginning)	September 26-27	Monday-Tuesday
Sh'mini Atzeret (Tabernacles, Concluding)	October 3	Monday
Simchat Torah	October 4	Tuesday
Pesach (Passover)	April 20-21	Thursday-Friday
Pesach, Concluding	April 26-27	Wednesday-Thursday



FIELD WATERMAN AND ANNA R. WA

1791 University of Vermont 1991  
**UVM**  
BICENTENNIAL

# Introduction

Chartered in 1791, the same year that Vermont became the fourteenth state in the union, the University of Vermont was established as the fifth college in New England. Much of the initial funding and planning for the University was undertaken by Ira Allen who is honored as UVM's founder.

The University of Vermont was the first college or university in the country to have it plainly declared in its charter that the "rules, regulations, and by-laws shall not tend to give preference to any religious sect or denomination whatsoever" — a clear assertion of Vermont's commitment to equality and enlightenment.

Nine more years passed before, in 1800, the University was finally set in motion with a president-professor and a handful of students.

UVM was founded in a day when U.S. colleges and universities existed primarily to educate men for the professions, especially for the ministry. Yet, in studying University history, Professor Emeritus Betty Bandel discovered that "this small institution located in a frontier community of New England became a pioneer in the kind of practical education which later became the basis for the establishment of the Land Grant universities — those institutions which made it possible for the sons and daughters of average citizens to aspire to a college education." For example, she noted that the University is believed to be the first nonmilitary institution to have offered engineering courses.

The University pioneered in yet another area of society, that of giving women equal status with men in higher education. In 1871, the University defied custom and admitted two women as students and four years later was the first institution in the country to admit women to full membership in the scholarly society, Phi Beta Kappa.

Tucked in the northwest corner of the Ira Allen Chapel grounds is a memorial to a late nineteenth century graduate of this University, philosopher John Dewey, whose ideas about practical education are still debated with passionate vigor.

The first building was subscribed by citizens of Burlington and when fire destroyed that edifice in 1824, its successor, for which General Lafayette laid the cornerstone, was again made possible by the citizens of Burlington. That building, the Old Mill, was only the first in a long line to be made possible by private philanthropy. The list includes all but one of the buildings on University Row: Ira Allen Chapel, Billings, Williams, Old Mill, and the Royal Tyler Theatre. Morrill Hall, the first UVM building to be provided by State funding, did not come until 1907.

Nearly all state universities function as departments of government, and the faculty and staff are state employees. In Vermont, the University is an "instrumentality" of the State and its Board of Trustees balances both the public and private sectors. The Board is composed of 25 members: nine self-perpetuating, nine elected by the State Legislature, three appointed by the Governor, and two members of the student body. The President of the University and the Governor of the State serve as *ex officio* members of the Board.

From the beginning, the University has relied on both public and private funding. Today, the University's appropriation from the State of Vermont is about 14 percent of the total operating budget of \$187 million. The largest single share (about 35 percent) is obtained from student tuition and fees. Grants and contracts account for about 25 percent of the budget and the remainder comes from alumni and other private philanthropy, endowment, sales, services, and auxiliary enterprises.

During 1987-88, 8,234 students were enrolled in the eight undergraduate colleges and schools — the Colleges of Agriculture and Life Sciences, Arts and Sciences, Education and Social Services, and Engineering and Mathematics, and the Schools of Allied Health Sciences, Business Administration, Natural Resources, and Nursing — and 1,084 were enrolled in the Graduate College and 369 in the College of Medicine.

The campus of the University of Vermont is located in Burlington, the State's largest city. Within a greater Burlington area of 100,000 people, the city with its population of 38,000 enjoys magnificent views of Lake Champlain and the Adirondack Mountains to the west and Vermont's Green Mountains to the east. Burlington is located approximately 200 miles northwest of Boston, 300 miles north of New York City, and 100 miles south of Montreal.

## THE UNIVERSITY MISSION

Combining the heritage of a private university with that of a land-grant institution, the University of Vermont and State Agricultural College embraces a broad range of instructional and research programs in the liberal disciplines and in the professions, and, as well, focuses a significant portion of its resources on serving the practical concerns of the citizens of the state. The blend of these characteristics is reflected in the student body, drawn from Vermont and throughout the nation. The University is at once a local and a national resource and, because of its moderate size, is accurately characterized as a comprehensive university with the teaching environment of a college.

The University of Vermont is dedicated to the advancement, transmission, and application of knowledge through teaching, research and scholarly pursuits, and public service. Its faculty and students participate in enhancing the understanding of self and of environment. Exposed to the range of human achievement, stimulated by a spirit of inquiry and intellectual rigor, faculty and students are enabled to develop and extend their knowledge.

The curricula of the undergraduate, graduate, and professional programs provide a balance between response to changing societal needs and the preservation and enhancement of the foundations of liberal education. The University offers a rich environment for research, scholarship, and creative work in many realms of human inquiry, sharing the excitement and fruits of investigation and creation with students and society. Through a variety of research, extension, continuing education, and other programs, the University provides assistance, in its special partnership with the state, in the solution of human, social, technological, environmental, and educational problems of the citizens of Vermont.

Supporting the mission of the University are the services and academic programs described in this catalogue and, in addition, the following:

## THE UNIVERSITY LIBRARIES

In the Bailey/Howe Library, the main unit of the University libraries, are located the services and collections relating to the humanities, social sciences, and many of the sciences. This library holds the largest book and map collection in Vermont, and maintains a representative collection of major periodicals, scholarly journals, indexes, and abstracting services. It is a depository for United States and Canadian government publications. The Special Collections Department includes the Wilbur Collection of Vermontiana, rare books, literary and his-





torical manuscripts, and the papers of many individuals associated with the state and the federal government. A separate Physics and Chemistry Library is located in the Cook Physical Science Building. Collections in medicine and the health sciences are located in the Dana Medical Library. The University Archives in the Waterman Building contain the permanent, official records of the University.

## THE GRADUATE COLLEGE

The mission of the Graduate College is to serve the needs of college graduates who desire a broader and more thorough knowledge of scholarship and research in their chosen fields. The College offers 57 programs leading to the Master's degree and 17 programs leading to the doctoral degree. For detailed information regarding graduate programs, degree requirements, and Graduate College regulations and procedures, refer to the Graduate College Catalogue available from the Graduate Admissions Office, 332 Waterman Building.

Persons applying to and enrolled in graduate programs are expected to be familiar with the general regulations of the Graduate College and with the specific degree requirements in their chosen fields of study. Questions pertaining to matters other than admission to graduate programs may be directed to the Graduate College Dean's Office, 335 Waterman.

## THE ROBERT HULL FLEMING MUSEUM

The Fleming Museum houses an important collection of more than 20,000 works: paintings, sculpture, graphics, costumes, and decorative arts representing the full range of world cultures. Highlights include paintings by such American and French masters as Winslow Homer and Jean Baptiste Camille Corot; 19th- and 20th-century American and European prints; American decorative arts and costumes; and outstanding ethnographic collections from the Native Americas and Africa. In addition to the permanent American and European Galleries, reinstalled after the Museum's renovation in 1984-85, changing exhibitions are scheduled throughout the year.

Major exhibitions planned for 1988-1989 include "Napoleon in Egypt," featuring a collection of engravings produced by artists and scholars who accompanied Napoleon on his expedition to Egypt in 1798 (through 11/5); "New England Now," an exhibition of works by 25 artists from the six New England states (11/18-1/22); and "Faces in the Parlour: Portraits from Vermont Collections" (Feb.-summer 1989). A show of contemporary Soviet painting is planned for fall 1989. Lecture series, free to UVM faculty, students, and staff, are held in the fall, winter, and spring on alternating Wednesdays. Special events include Community Family Day, film programs, concert series, performing arts, gallery talks, and exhibition openings.

Recognizing the importance of the Museum's connection with the University's academic programs, the Fleming provides access to the use of the collections and exhibitions for study and research. The Wilbur Room, which contains several thousand art volumes, operates as a noncirculation reference library open to the University and to the public on Wednesday afternoons and by appointment with the Museum Educator. Undergraduate students have interned at the Museum in art, history, English, education, and anthropology.

Graduate and undergraduate students have curated exhibitions and have received academic credits for developing and conducting a series of art classes for children. Work study students have opportunities in areas of art education, public relations, marketing, security, and exhibition design and construction.

Stocked with books, posters, and items related to the exhibitions, the Museum Store is an inviting resource at gift-giving time. The Fleming has more than 600 members, with a student membership category available.

## VERMONT ETV

Vermont ETV, the public television network owned and operated by the University of Vermont, serves the state.

With studios and offices on the Fort Ethan Allen campus, the network provides an instructional service to schools, college courses for credit, programs for children out-of-school, and a broad spectrum of Eastern Education Network and Public Broadcasting Service programs. Locally produced programs address the concerns and issues of Vermonters.

Programs are broadcast over WETK-TV, channel 33, Burlington; WVTB, channel 20, St. Johnsbury; WVER, channel 28, Rutland; WVTA, channel 41, Windsor; and on channels 74, 76, 79 at Manchester, Wilmington, and Bennington.

## UNIVERSITY EXTENSION SERVICE

Extension Service agents in every Vermont county simplify and quickly spread the knowledge of UVM's resources and research directly to Vermonters so latest findings can be put to work.

This "grassroots" approach which reaches nearly all Vermont residents has triggered rapid advances in agriculture, community and natural resources, youth development, and home economics.

## MORGAN HORSE FARM

The Morgan Horse Farm in Weybridge, Vermont, has been a shrine for Morgan horse lovers for more than a century. The Morgan breed dates back to 1789 when the first small but powerful stallion was born to a mare owned by school teacher Justin Morgan.

The Morgan Farm was established in 1878 by Joseph Battell of Middlebury who compiled the first volume of the Morgan Horse Registry and constructed the farm landmark, an ornate Victorian barn with mansard roof. In 1907, Battell deeded the farm to the U.S. Government, which in 1951 turned the farm over to the University of Vermont.

The farm has become a laboratory for UVM students and the focal point for Morgan Horse lovers around the world. The farm continues to host thousands of visitors annually.

A versatile, highly intelligent horse, the Morgan is Vermont's State Animal. The breeding program at the Morgan Farm has produced numerous blue ribbon winners at the National Morgan Horse Show.

## UNIVERSITY PROFESSORSHIPS

Since the establishment of the Williams Professorship in Mathematics in 1853, the University has been the recipient of a number of generous endowments intended to support teaching and research in various academic fields. Among them are:

The Williams Professorship of Mathematics, 1853, honors Azarias Williams of Concord, Vermont, merchant and judge, native of Sheffield, England, who in 1839 deeded to the University extensive holdings in land, at that time valued at \$25,000. In return, he received a small annuity during the remaining ten years of his life.

The Marsh Professorship of Intellectual and Moral Philosophy was established in 1867 to honor James Marsh, distinguished UVM president and philosopher of the 1830's. Many alumni contributed to the fund which established this chair. Robert W. Hall, Professor of Philosophy, is the Marsh Professor of Intellectual and Moral Philosophy.

The Pomeroy Professorship of Chemistry was established in 1878 by John N. Pomeroy, A.B., 1809, who lectured on chemistry and later, during his career as a lawyer in Burlington, served as trustee of the University. He was awarded the LL.D. in 1861.

The Howard Professorship of Natural History and Zoology was established in 1881 by John Purple Howard, a Burlington resident who was a generous benefactor both of the University and of the City of Burlington.

The Flint Professorship of Mathematics, Natural or Technic Science, frequently awarded in the field of civil engineering, was established in 1895 by a bequest from Edwin Flint, A.B., 1836, lawyer and judge in Wisconsin and Iowa until his death in 1891.

The Converse Professorship in Commerce and Economics was established in 1899 as a result of an endowment made by John H. Converse, A.B., 1861, LL.D., 1897, Philadelphia railroad financier, who as a trustee of the University proposed the teaching of Latin, modern languages, history, bookkeeping, penmanship, and other subjects necessary to men and women:

The Thayer Professorship of Anatomy was established in 1910 to honor Dr. Samuel White Thayer, Dean of the College of Medicine from 1854-71 and 1880-82, from contributions made by alumni of the College of Medicine. Professor of Anatomy Rodney L. Parsons is the Thayer Professor.

The McCullough Professorship of Political Science was established in 1926 through grants made by Gov. and Mrs. John G. McCullough of Bennington, Vermont. Gov. McCullough was a lawyer and attorney general in California during the mid-nineteenth century, later a railroad financier and benefactor of many educational and other enterprises during his long residence in Vermont. Professor of Political Science Raul Hilberg is the McCullough Professor.

The Perkins Professorship of Zoology was established in 1931 to honor George H. Perkins, for 64 years a teacher of science and dean of the College of Arts and Sciences for many years. Grant for this professorship was made by John E. Lynch of Boston, Massachusetts.

The Shipman Professorship of Ophthalmology was established in 1934 by a bequest from Dr. Elliot W. Shipman, M.D., 1885. After beginning his practice in Vergennes, Vermont, and studying ophthalmology in Berlin, Dr. Shipman practiced medicine in Richmond Hill, New York, for 35 years.

The Lyman-Roberts Professorship of Classical Languages and Literature was established in 1941 by Mrs. Robert Roberts and Mrs. Edward Lyman to honor Robert Roberts, a well-known lawyer and abolitionist who was mayor of Burlington in the 1890's and served as a University trustee from 1895-1939. Jean M. Davison, Professor of Classics, is the Lyman-Roberts Professor.

The Corse Professorship of English Language and Literature was established in 1952 by Frederick M. and Fannie C.P. Corse. Mr. Corse, A.B., 1888, and registrar and teacher of mathematics and economics in the University during the 1890's, was general manager for Russia of the New York Life Insurance Company, with offices in Petrograd (now Leningrad) for 17 years before the Russian Revolution of 1917.

The Lawrence Forensic Professorship of Speech was established in 1965 by Edwin W. Lawrence, lawyer and financier of Rutland, Vermont, A.B., 1901, generous patron of forensic activities at the University.

The Sanders Professorship was established in 1968 as a chair endowed by the alumni, honoring the Rev. Daniel Clarke Sanders, first president of the University. Carl H. Reidel, Professor of Natural Resources, is the Daniel Clarke Sanders Professor of Environmental Studies.

The John L. Beckley Professorship in American Business was established in 1983 by John L. Beckley, 1934 graduate of UVM and member of the Board of Trustees from 1966 to 1970, to encourage economic education emphasizing private enterprise, the free market, and individual initiative. Ronald Savitt, Professor of Business Administration, is the Beckley Professor.

The Bishop Robert F. Joyce Distinguished University Professorship of Gerontology was established in 1983 by contributions from alumni and friends, honoring Robert F. Joyce, 1917 graduate of UVM, former member of the Board of Trustees from 1948 to 1954, and Bishop of the R.C. Diocese of Burlington for 15 years. Professor of Sociology Stephen J. Cutler is the Joyce Professor.

The Buttles Professorship in Pathology was established in 1984, to honor Ernest Hiram Buttles, Professor of Pathology and Bacteriology in the College of Medicine from 1921 to 1946. Roy Korson, Professor of Pathology, is the Buttles Professor.

## ACCREDITATIONS

The University of Vermont is accredited by the New England Association of Schools and Colleges, Inc., a nongovernmental, nationally-recognized organization whose affiliated institutes include elementary schools through collegiate institutions offering postgraduate instruction.

Accreditation of an institution by the New England Association indicates that it meets or exceeds criteria for the assessment of institutional quality periodically applied through a peer group review process. An accredited school or college is one which has available the necessary resources to achieve its stated purposes through appropriate educational programs, is substantially doing so, and gives reasonable evidence that it will continue to do so in the foreseeable future. Institutional integrity is also addressed through accreditation.

Accreditation by the New England Association is not partial but applies to the institution as a whole. As such, it is not a guarantee of the quality of every course or program offered or the competence of individual graduates. Rather, it provides reasonable assurance about the quality of opportunities available to students who attend the institution.

Inquiries regarding the status of an institution's accreditation by the New England Association should be directed to the administrative staff of the University. Individuals may also contact the New England Association of Schools and Colleges, The Sanborn House, 15 High Street, Winchester, Mass. 01890, (617) 729-6762.

Specific program accreditations are listed below:

### AGRICULTURE

Occupational Education—National Council for Accreditation of Teacher Education

### ALLIED HEALTH SCIENCES

Dental Hygiene—American Dental Association  
 Medical Technology—American Medical Association  
 (Committee on Allied Health Education Accreditation)  
 upon recommendation of the National Accrediting  
 Agency for Clinical Laboratory Sciences  
 Physical Therapy—American Physical Therapy  
 Association  
 Radiologic Technology  
 Radiation Therapy Technology—American Medical  
 Association (Committee on Allied Health Education  
 Accreditation) upon recommendation of the Joint  
 Review Committee on Education in Radiologic  
 Technology  
 Nuclear Medicine Technology—American Medical  
 Association (Committee on Allied Health Education  
 Accreditation) upon recommendation of the Joint  
 Review Committee on Educational Programs in  
 Nuclear Medicine Technology

### ARTS AND SCIENCES

Speech-Language Pathology—American Speech-  
 Language-Hearing Association  
 Music—National Association of Schools of Music  
 Clinical Psychology—American Psychological Association

**BUSINESS ADMINISTRATION**

American Assembly of Collegiate Schools of Business

**EDUCATION**

National Council for Accreditation of Teacher Education  
Social Work—Council on Social Work Education  
Vermont Department of Education—Teacher Education  
Program Approval

**ENGINEERING AND MATHEMATICS**

Engineering Programs (Mechanical, Electrical, Civil)—  
Engineering Accreditation Commission of the Accreditation  
Board for Engineering and Technology, Inc.

**MEDICINE**

American Medical Association, Association of American  
Medical Colleges

**NATURAL RESOURCES**

Forestry—Society of American Foresters

**NURSING**

Professional Nursing—National League for Nursing  
Technical Nursing—National League for Nursing

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# Admission to the University

The undergraduate Admissions Office is located in Clement House, 194 South Prospect Street, (802) 656-3370.

## ADMISSIONS CRITERIA

Qualification for admission is determined on the basis of the secondary school record, rank in graduating class, recommendations, writing ability, strength of preparation in the area chosen as a major, College Board Scholastic Aptitude Test results (results from the American College Testing program may be substituted), and other supporting information (interviews, achievement test scores, essays, activities, post-high school experiences). Additional information may also be requested by the Admissions Office. Each application is carefully reviewed by the Admissions Office staff and, in some cases, by the college or school to which the student is applying. The candidate's record is thoroughly examined in order to determine whether the student has adequately prepared for the chosen academic program. All qualified Vermont freshman applicants will be offered admission. Nonresident applicants are competing for admission and will be selected on the basis of overall academic qualifications, leadership potential, special talents, and ability to add to the diversity of the undergraduate population.

Prospective freshmen are expected to present at least 16 high school units, including a minimum of four years of English, three years of mathematics, three years of social sciences, two years of the same foreign language, and two years of natural or physical science (including at least one year of lab science). In addition to the required and recommended courses, the overall strength and challenge of a student's course load will be important. Applicants without a high school diploma must submit an official transcript of the high school courses they did complete and a copy of their General Education Development (G.E.D.) certificate. A local high school guidance office may be contacted for information about obtaining the G.E.D. certificate.

Additional courses in mathematics, history, science, foreign language, and the fine arts and music are strongly recommended as desirable preparation for college. A student planning to major in **music** (Bachelor of Music degree) must arrange for an audition with the chairperson of the department prior to the deadline for completion of the application. A student seeking

AREA	REQUIRED COURSES	RECOMMENDED COURSES
<b>ALL AREAS</b>	4 years of English 3 years of mathematics (2 yrs. algebra, 1 yr. geometry) 3 years of social science 2 years of natural or physical science 2 years of the same foreign language	
<b>Agriculture and Life Sciences</b>	1 year of biology and 1 year of chemistry (for science majors only)	1 year of biology 1 year of chemistry 1 year of senior mathematics 1 year of physics and 4 years of mathematics (including trigonometry) (for science majors only)
<b>Allied Health Sciences</b>	1 year of physics (for physical therapy majors) 1 year of biology 1 year of chemistry	1 year of physics
<b>Arts and Sciences</b>		4 years of mathematics (including trigonometry) Continue foreign language, junior and senior years
<b>Business Administration</b>	College preparatory curriculum 4 years of mathematics (including trigonometry)	1 additional year of science
<b>Education and Social Services</b>		1 year of biology
<b>Engineering and Mathematics</b>	4 years of mathematics (including trigonometry) 1 year of physics 1 year of chemistry (for engineering majors)	1 year of physics 1 year of chemistry (for all non-engineering majors)
<b>Environmental Program</b>	(See appropriate college above)	Additional humanities and science courses
<b>Home Economics Program</b>		1 year of chemistry
<b>Nursing</b>	1 year of chemistry (for professional nursing majors) 1 year of biology	1 additional year of science in the senior year (for professional nursing majors) 1 year of chemistry (for technical nursing majors)



the Bachelor of Arts degree in music is *not* required to audition. Students who are unable to audition on campus may submit a tape recording of their performance with a letter of explanation to the chairperson of the department. All materials (including cassettes, photographs, slides, poetry, newspaper articles, art work, etc.) submitted to the Admissions Office will become the property of the University of Vermont and will not be returned.

Sons and daughters of alumni of the University of Vermont are encouraged to apply and are given special consideration. Competition for admission means that the University must evaluate the application of each alumni son or daughter in terms of the total number of applications, the applicant's relative qualifications, and the limitation which must be placed on the number of applicants who may be offered admission to the various academic programs available.

The University of Vermont reserves the right to make changes in course requirements without prior notice. Refer to individual program descriptions in this catalogue for further information. The University of Vermont supports the efforts of secondary school officials and governing bodies to have their schools achieve regional accredited status to provide reliable assurance of the quality of the educational preparation of their applicants for admission.

## COLLEGE ENTRANCE EXAMINATIONS

The College Board will administer a series of scholastic aptitude and achievement tests during the year. Scholastic Aptitude Test (SAT) scores are required of all applicants. Complete information may be obtained from the College Board, Box CN 6200, Princeton, New Jersey 08541-6200, or College Board, Box 1025, Berkeley, California 94701. Examination results from the American College Testing (ACT) program may be substituted.

The College Board Achievement Tests in mathematics and the sciences are not required but may be useful in all cases where these subjects are to be continued in the student's curriculum. The purpose of recommending these Achievement Tests is for placement only as scores are used in advising students regarding their selection of courses.

## ADVANCED PLACEMENT EXAMINATIONS

The University welcomes Advanced Placement Examinations of the College Board in all areas tested. Credit for Advanced Placement (AP) is granted as a specific University course under the following general guidelines: Scores of 4 or 5 all exams; score of 3, some selected exams; score of 2, Mathematics BC only. AP course equivalencies are determined for the University by the department governing the subject area of the AP exam and are awarded by the Office of Transfer Affairs. Since AP credit is assigned as a regular University course, it can be used to fulfill major, distribution, general education, or elective requirements as applicable.

## APPLICATIONS AND DEADLINES

The University of Vermont welcomes applications from all interested students regardless of race, religion, age, handicap, nationality, or sex. Prospective freshman and transfer students interested in applying for admission in either January or September can receive applications by writing to: Admissions Office, University of Vermont, 194 South Prospect Street, Burlington, Vermont 05401-3596. Upon filing an application, all candidates are required to pay a nonrefundable \$30 application fee which is used to meet the cost of processing the application.

Applications and supporting materials for freshman admission in September should be on file and complete by February 1 (November 1 for Early Notification and Early Decision; see

below). For transfer students, applications should be on file and complete by April 1. Transfer students applying to Physical Therapy have a February 1 deadline.

Applications and supporting materials for admission in January should be received in the Admissions Office by December 1. Applications not completed by this date may be closed out as incomplete. Some students will be asked by Admissions to supply final semester grades before a decision is given, in which case a final decision on admission may not be made until immediately prior to the start of spring semester. Alternative educational plans should be made in the event of non-admission.

The University of Vermont will give preference to all qualified transfer applicants who are Vermont residents.

Financial aid information should be submitted by March 1 for freshmen and May 1 for transfer students, regardless of the semester of admission.

## APPLICATION REACTIVATION

Students who have applied previously to UVM must complete a new application and submit the application fee when reapplying. It may not be necessary to have additional official transcripts sent, however, if the original copies are still on file in the Admissions Office (usually for one year after the initial application). Official transcripts of course work completed since the original application must be sent.

Individuals who have previously attended UVM as matriculated students need not file an application with the Admissions Office. Instead, they should consult the dean of the college or school in which they were previously enrolled to gain re-admission.

## EARLY NOTIFICATION PROGRAM

An early notification program is available for prospective fall freshmen who are Vermont residents (see residency rules, page 13). Vermonters applying under this program will be notified of their admission during mid- to late December if the application, official high school transcript (including first marking period grades), official report of SAT or ACT scores (sent directly from the testing company), and high school recommendation have been received by November 1. Students who receive offers of admission under this program will have until May 1 to respond.

## EARLY DECISION PROGRAM

Fall freshman applicants who have indicated the University of Vermont as their "first choice" may wish to apply under the Early Decision Program. Students applying under this program will be notified concerning admission by the end of December if the application, official high school transcript, official report of SAT or ACT scores (sent directly from the testing company), and high school recommendation have been received by November 1. Students who receive offers of admission under this program will be asked by January 15 to reaffirm their commitment to attend the University, provided financial aid will be adequate. At this time, admitted students should withdraw applications to other colleges and universities and pay the acceptance fee and advance tuition deposit at UVM.

Some Early Decision candidates will be notified that their application has been deferred for review with the regular fall freshmen group. These candidates are not obligated to attend the University if subsequently offered admission in early April.

A small number of Early Decision applicants may be denied admission and cannot apply again under the February 1 deadline.

## VERMONT SCHOLARS PROGRAM

The Vermont Scholars Program of the University of Vermont recognizes and rewards those entering Vermont resident freshmen who are in the top of their graduating class and have excelled on the Scholastic Aptitude Test (SAT). In making the awards, school leadership and community involvement will be considered along with academic excellence. Finalists will receive early notification of admission, guaranteed enrollment in freshman course selections, preference in freshman housing, and an award of full in-state tuition and required fees. Awards will be made up to four years or to the conclusion of the baccalaureate degree as long as an honors-level grade-point average and normal progress toward the degree are maintained. While at the University of Vermont, scholars will be offered many special educational opportunities to enrich their lives on campus. For specific eligibility requirements, interested students should contact the Admissions Office well before November 1 of their senior year.

## NEW ENGLAND REGIONAL STUDENT PROGRAM

The University of Vermont is currently an active participant with the Universities of Connecticut, Maine, Massachusetts, New Hampshire, and Rhode Island, and with Lowell University, Southeastern Massachusetts University, and the public four-year and two-year colleges and technical institutes in a program of regional cooperation aimed at increasing educational opportunities for qualified young men and women of the New England states. Under the program, New England residents are given tuition privileges in certain specialized curricula which are not offered by public institutions in their home state. New England students enrolled in regional student programs at the University of Vermont who are not residents of Vermont are charged 125 percent of the University's in-state tuition. A brochure detailing these specialized curricula is available through the New England Board of Higher Education, 45 Temple Place, Boston, Massachusetts 02111, (617) 357-9620.

Under the New England Regional Student Program, the University of Vermont offers the following undergraduate programs for the 1988-89 academic year:

### REGIONAL PROGRAMS

Offered By The University of Vermont	To Students From
Canadian Studies	CT, MA, NH, RI
Dairy Foods	ME, MA, NH, RI
Greek	CT, ME, RI
Latin	RI
Russian	ME, NH
Russian/Eastern European Studies	ME, NH, RI

## INTERVIEWS AND VISITS

Students are encouraged to visit the campus to form their own first-hand impressions of the University. Prospective students may schedule an appointment with a current UVM student or a staff member on most weekdays in order to gain information about the academic and nonacademic aspects of undergraduate life. Plans should be made as early as possible since interview appointments may be filled quickly.

An overnight visit with a student can usually be arranged during the academic year. Overnight visits are scheduled Monday through Thursday so that the prospective student may attend class the next day. At least two weeks' notice is normally required so that student hosts may make appropriate preparations.

On many Saturday mornings while the University is in session, group information sessions are held on campus for interested

students and parents. Students should write or call the Admissions Office, (802) 656-3370, for additional information about the group meetings, overnight visits, or individual appointments.

## FOREIGN/INTERNATIONAL STUDENTS

**APPLICATION PROCEDURES** The University of Vermont welcomes qualified applicants from other countries. International students interested in applying to UVM should write to the Admissions Office and request an application form. International students applying for admission will be required to submit transcripts of all college preparatory education, together with official, certified translations if the transcripts are not in English. These translated credentials must be certified by an officer of the educational institution issuing the document or by a United States or local government official. Once official documents are received, they become the property of the University of Vermont and will not be returned to the student.

In addition to the required SAT (Scholastic Aptitude Test) or ACT (American College Testing) scores and other supporting documents, students whose original language is not English are also required to submit scores from the TOEFL (Test of English as a Foreign Language). Admissions deadlines for international applicants are December 1 (for January admission) and February 1 (for September admission).

The University of Vermont does not offer an English as a Second Language Program. Therefore, students who need to strengthen their English proficiency (TOEFL score below 550) before enrolling at UVM may wish to consider studying English in the Intensive English Programs and/or the Undergraduate Associate Program offered by Saint Michael's College (SMC), an accredited institution of higher learning located in the neighboring city of Winooski, Vermont. Although subsequent admission to UVM cannot be guaranteed for students enrolled in the Saint Michael's programs, UVM will give serious consideration to applications submitted by qualified SMC students who successfully complete one or more of the following Saint Michael's programs: (1) the Intensive English Program; (2) the Undergraduate Associate Program; (3) one or two years of undergraduate academic study. Students who need additional English study should apply directly to Saint Michael's College and indicate their specific area of interest for continued study at UVM on their application so that cooperative advising services can be provided. For further information about Saint Michael's College, write to the Center for International Programs, Saint Michael's College, Winooski, Vermont 05404 U.S.A. Telephone: (802) 655-2000, extension 2300; Telex 5102990013, VT, SMC WINO.

At the present time, only very limited financial aid is available from the University of Vermont to nonimmigrant international students. Therefore, students without adequate financial support from other sources are discouraged from submitting requests for application forms. All international students attending UVM on nonimmigrant student visas are charged out-of-state tuition rates.

If a student is admitted to the University of Vermont, an I-20 form (Certificate of Eligibility for an F-1 visa) will be prepared by the Advisor in the Office of International Educational Services. Before the I-20 form is mailed, the student will be required to show proof of adequate funding in the form of a bank statement or an official letter outlining the financial support from a sponsoring institution or organization.

International students interested in graduate studies at the University of Vermont should write directly to the Graduate College Admissions Office, Waterman Building, University of Vermont, Burlington, Vermont 05405, INTERNATIONAL.

**INTERNATIONAL STUDENT SERVICES** An Advisor to International Students is available to provide counseling and



assistance to international students on personal and academic problems, and on matters relating to immigration and social and cultural adjustment. In a special pre-orientation prior to the beginning of the fall semester, the Office of International Educational Services provides new international students with an introduction to the University and the Burlington community. An active campus International Club provides an opportunity for international students to contribute to campus life and to make friends outside the classroom.

### **TRANSFERRING TO THE UNIVERSITY**

The University of Vermont considers a student a transfer applicant for purposes of admission if, after graduation from high school, one or more courses at the postsecondary level are attempted. Students interested in transferring to the University of Vermont must first satisfy all freshman entrance requirements as outlined previously, including having official high school transcripts (or General Education Development Certificates) and official SAT (or ACT) score reports sent to the Office of Admissions. Also, transfer students are required to provide an official transcript for all postsecondary school course work attempted. A transfer applicant may not disregard the record of any previous education.

Vermont residents (see page 13 for residency requirements) will be offered admission if they qualify. Nonresidents must compete for transfer admission.

Applications and supporting materials must be received in Admissions by December 1 for mid-year (January) admission. Students applying for fall admission into Physical Therapy have a February 1 application completion date. All other students applying for fall admission have an April 1 deadline for application completion.

A student who transfers to the University of Vermont from another accredited college or university may be granted provisional credit for all courses satisfactorily completed with a grade of C- or better, providing that the courses are similar in nature and intensity to courses taught at the University of Vermont. There is a two-stage process for transfer credit evaluation. The Office of Transfer Affairs will determine which course work is acceptable to the University of Vermont in general. The list of courses determined acceptable to the University is then sent to the student's college or school. The academic dean of the college/school to which a student has been admitted will determine how courses fit into a specific degree program as well as the length of time required for completion of degree requirements.

The grade-point average of transfer students is computed *only* on course work taken at the University of Vermont. Grades from other institutions do not appear on a University of Vermont transcript.

All transfer credit is provisional. The provisional credits are granted once the student completes one semester of course work as a degree student at the University of Vermont.

### **STUDENT EXCHANGE: NEW ENGLAND STATE UNIVERSITIES**

The six New England land-grant universities (Universities of Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut) participate in an exchange program to enable students at the subdegree level to take advantage of a course or combination of courses not available at the home in-

stitution. In order to participate in the program, state university students must:

1. Identify a course or combination of courses related to their area of academic interest and not available on the home campus.
2. Receive permission from the appropriate university exchange authorities at both the sending and receiving institutions.
3. Meet minimum eligibility requirements which include the following: In general, students must be in good standing and have at least a 2.50 grade-point average; must be degree candidates; and must be at least first semester sophomores (application may be made as early as the second semester of the freshman year). There is no upper limit in terms of class standing on participation.

Exchanges may not exceed a total period of two academic semesters, but these need not be taken consecutively. Summer sessions are not considered part of the exchange program. Course work approved by the student's host institution and completed satisfactorily is fully transferable to the home institution. Transferability of grades and inclusion in grade-point averages are subject to home institutional policy.

The student will pay normal tuition and required fees to the home institution and room and board (where applicable) to the host institution. Students on financial aid must contact their home institution's financial aid office to determine eligibility for continued scholarship assistance.

Participation in the exchange program will not affect a student's residence status either at the home or host institution, nor does participation improve or prejudice possibilities for transfer.

For information, contact the Office of the Provost, 349 Waterman Building, University of Vermont.

## UNIVERSITY RESIDENCY REGULATIONS

### IN-STATE STATUS REGULATIONS

The Vermont Legislature has established a lower rate of tuition for students who are Vermont residents. These regulations define eligibility requirements for in-state status classification. All students at the University of Vermont and State Agricultural College (UVM) shall be assigned an in-state or out-of-state status classification consistent with these regulations. Vermont domicile must be established for a student to be eligible for in-state status.

#### In-State Status Classification Rules

1. Domicile shall mean a person's true, fixed, and permanent home. It is the place at which one intends to remain indefinitely and to which one intends to return when absent.
2. As one element of domicile, a student must reside in Vermont continuously for one year prior to the semester for which in-state status is sought.
3. A residence established for the purpose of attending UVM shall not by itself constitute domicile.
4. An applicant becoming a student within one year of first moving to the state shall have created a rebuttable presumption that residency in Vermont is for the purpose of attending UVM and/or acquiring in-state status for tuition purposes.
5. A domicile or residency classification assigned by a public or private authority neither qualifies nor disqualifies a student for UVM in-state status. Such classification may be taken into consideration, however, in determining the student's status at UVM.
6. It shall be presumed that a student who has not reached the age of majority (18) holds the domicile of his/her parents or legal guardian(s).
7. Receipt of financial support by a student from his/her

family shall create a rebuttable presumption that the student's domicile is with his/her family, regardless of whether the student has reached the age of 18.

8. A student who has not reached the age of 18 whose parents are legally separated or divorced shall be rebuttably presumed to hold the domicile of the parent with legal custody.
9. A student of parents legally separated or divorced may be granted in-state status if a noncustodial or joint custodial parent is domiciled in Vermont and has contributed more than 50 percent of financial support for at least one year prior to the semester for which in-state status is sought.
10. The burden of proof as to eligibility for in-state status rests with the student. Eligibility must be established by clear and convincing evidence.

#### In-State Status Classification Documentation

11. The student must submit with the application form all relevant information.
12. The classification decision shall be based upon information furnished by the student, information requested of the student, and other relevant information available consistent with University policies and procedures and legal guidelines.
13. Testimony, written documents, affidavits, verifications, and/or other evidence may be requested.
14. The student's failure to produce information requested may adversely affect the decision for in-state status.
15. A student or others furnishing information may request the deletion from documents of irrelevant private data.

#### In-State Status Classification Appeals

16. The decision of the Residency Officer must be appealed in writing to the Residency Appellate Officer within thirty (30) calendar days of the date of the Residency Officer's written decision. Appeal to the Residency Appellate Officer is the final appeal at UVM.

#### In-State Status Reclassification

17. A student who does not qualify for in-state status classification may reapply for such classification each subsequent semester.
18. In-state status classification becomes effective the first semester following the date of successful application.

#### Re-Examination of Classification Status

19. Classification status may be re-examined upon the initiative of the Residency Officer in the exercise of sound discretion. Circumstances such as periodic enrollment may be cause for re-examination.

Adopted by the Board of Trustees, December 14, 1974; amended June 13, 1981, and May 2, 1987. These regulations took effect with the 1987-88 academic year.

## ORIENTATION AND SPECIAL REQUIREMENTS

Following acceptance, students must submit by the appropriate deadline dates an acceptance fee and advance tuition deposit. New students are also required to come to the campus for an orientation program; schedules and dates of these meetings are mailed prior to enrollment. The Orientation Program takes place in June and August for the fall semester and in January for the spring term. During the two-day program students register for courses, meet informally with faculty and other students, and learn about available student services. Immunization and health forms must be submitted to the Student Health Center by August 1 of the year of entry.





# Student Expenses and Financial Aid

The student expenses outlined in the following paragraphs are anticipated charges for the academic year 1988-89. Changing costs may require adjustment of these charges before the beginning of the fall semester.

## UNDERGRADUATE TUITION AND FEES APPLICATION FEE

A non-refundable application fee of \$30 is charged each applicant for admission to a University degree program.

## ACCEPTANCE FEE AND ADVANCED TUITION PAYMENT

All new undergraduate applicants who have been accepted by the University are required to pay \$225 in order to reserve a place in the next enrolling class. Regular freshman students accepted for the fall semester must pay the deposit by May 1. Most transfer students admitted for the fall must pay the deposit within two weeks of the offer of admission. Students admitted in January for the spring semester may have less than two weeks in which to pay the deposit. A portion of the fee is for initial advising, selection of courses, and personal orientation to the campus, a requirement for all incoming undergraduate degree students. The remainder will be applied to the initial semester's tuition bill.

If a newly admitted student who has paid the required deposit subsequently chooses not to attend the University, the student will receive a \$100 refund if the University is notified in writing prior to the beginning of the semester for which the student was admitted. If the University is notified after the beginning of the semester, the entire deposit is forfeited.

## ESTIMATED YEARLY EXPENSES

Listed below are estimated expenses (excluding transportation, laundry, and spending money) based on the regular tuition for undergraduate students followed by an explanation of these charges.

	<i>Resident</i>	<i>Nonresident</i>
<i>Tuition</i> . . . . .	<i>\$3,400</i>	<i>\$10,450</i>
<i>Housing (Double Room)</i> . . . . .	<i>2,348</i>	<i>2,348</i>
<i>Meals (Minimum Plan)</i> . . . . .	<i>1,300</i>	<i>1,300</i>
<i>Inter-Residence Association Fee</i> . . . . .	<i>12</i>	<i>12</i>
<i>Library and Athletic Bond Fees</i> . . . . .	<i>92</i>	<i>92</i>
<i>Student Health Fee</i> . . . . .	<i>142</i>	<i>142</i>
<i>Student Accident &amp; Sickness Insurance (Optional)</i> . . . . .	<i>173*</i>	<i>173*</i>
<i>Student Activities Fee</i> . . . . .	<i>58</i>	<i>58</i>
<i>Books and Supplies</i> . . . . .	<i>380*</i>	<i>380*</i>
<i>Student Center Fee</i> . . . . .	<i>22</i>	<i>22</i>

<i>Total, excluding personal and miscellaneous costs</i> . . . . .	<i>\$7,927</i>	<i>\$14,977</i>
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\*Estimated

## TUITION

**Vermont Residents:** \$142 per credit hour through 11.5 hours. From 12-18 credit hours—\$1,700 per semester plus \$142 per credit hour for each hour in excess of 18 hours.

**Nonresidents:** \$436 per credit hour through 11.5 hours. From 12-18 credit hours—\$5,225 per semester plus \$436 per credit hour for each hour in excess of 18 hours.

*Note:* Courses taken for audit are also included in determining the number of credit hours for which a student is billed.

## HOUSING CHARGES

**Room and Board:** All housing agreements include both room and board and are legally binding for the nine-month academic year. Each occupant is liable for the yearly rent, one half to be paid each semester. The room charge per person is \$1,878 for triple occupancy, \$2,348 for double occupancy, and \$2,584 for a single room. Depending on vacancies, a limited number of large singles may be available at the rate of \$2,818 a year.

The minimum University meal plan is \$1,300 yearly, one half to be paid each semester. The minimum meal plan is *not* designed to meet all the needs of most students. Rather, the plan allows individual students to purchase whatever additional amount of food service beyond the minimum level they feel is necessary to meet their own nutritional needs. The University's food service system includes not only dining halls but also the various campus snack bars, restaurants, and grocery stores. Questions regarding food services should be directed to the University Dining Services/Marriott, Robinson Hall, Redstone Campus.

A written request is required of any student wishing to cancel a housing agreement. Any student cancelling a housing agreement after June 15 but before September 6, 1988, will be assessed a \$100 penalty. Unless specifically authorized by the Office of Residential Life, no room cancellations will be honored after the beginning of the fall semester.

## INTER-RESIDENCE ASSOCIATION (IRA) FEE

A \$12 per year (\$6 per semester) fee is charged to each resident to be used for activities within the residence hall system.

## LIBRARY BOND FEE

A library bond fee of \$44 per year (\$22 per semester) is charged to all students enrolled for 12 hours or more. This fee is assessed in accordance with the requirement of the indenture covering the construction of the addition to the Bailey/Howe Library.

## ATHLETIC BOND FEE

An athletic bond fee of \$48 per year (\$24 per semester) is charged to all students enrolled for 12 hours or more. This fee is assessed in accordance with the requirement of the indenture covering the construction of additions and improvements to athletic facilities.

## HEALTH FEE

The health fee of \$142 per year is assessed per semester. It is mandatory for students enrolled in 12 or more credit hours and

optional for other students. Payment of the health fee entitles the student to most of the services available at the Student Health Center without additional cost. An optional Summer Health Fee is available to students remaining in the area during the summer months.

Students also have the option of purchasing a Student Accident and Sickness Insurance Policy through the University. This policy provides coverage for many services not included in the health fee as well as hospitalization benefits. To participate in this program the student must pay a modest annual premium plus the health fee for the two semesters of the academic year. Students not covered by the health insurance policy of a parent, guardian, or spouse are strongly encouraged to purchase the Student Accident and Sickness Insurance Policy.

### STUDENT CENTER FEE

A student center fee of \$22 per year (\$11 per semester) is charged to all students enrolled for 12 or more credit hours. This fee is assessed in accordance with the requirement of the indenture covering the construction of the addition to the Billings Student Center.

### STUDENT ACTIVITIES FEE

Undergraduate degree students enrolled in four or more credit hours are charged a fee of \$58 per year (\$29 per semester). This fee is allocated by the Student Association toward the support of student organizations and student activities.

### BOOKS AND SUPPLIES

The estimated yearly cost of books and supplies at \$360 is a *low* average. Some particular curricula may require one-time purchases which will change this amount.

Students in the College of Engineering and Mathematics and School of Business Administration should add about \$100 for computer software to their estimated yearly costs for books and supplies.

Dental Hygiene students should add \$550 for the first year and \$200 for the second year which will be collected during the first week of the fall semester.

Radiologic Technology students should add about \$85 for uniforms and other related expenses.

Technical Nursing students should add about \$100 for uniforms and other related expenses in the beginning of the freshman year. Professional Nursing students should add about \$100 for uniforms and other related expenses in the second semester of the sophomore year and about \$125 in the beginning of the junior year.

Students enrolled in art courses should expect to incur a lab or materials cost roughly equivalent to the cost of books in other courses. In certain courses, instructional materials are purchased in bulk by the department and costs are prorated among students at a far lower rate than if they were purchased individually.

### OPTIONAL FEES

#### Locker-Towel Fee

All students enrolled in physical education activity courses and others who wish to have an assigned locker must pay a locker-towel fee each year or any portion thereof. This fee provides a locker and a clean towel after each use of the gymnasium facility.

### UNIQUE FEES

#### College of Engineering and Mathematics and School of Business Administration

All new freshmen and transfer students who will graduate in 1989 or later entering programs in the College of Engineering and Mathematics and the School of Business Administration are required to purchase a microcomputer. Details on the costs and the machine specifications are provided to the student at the time of admission. Students eligible for financial aid can have the cost of the microcomputer acquisition and maintenance built into their financial aid package.

#### Credit by Examination

A fee of \$35 per credit hour will be charged for administration of special tests in areas for which academic credit may be received.

#### Fees for Courses in Music Performance Study

Private instrumental and voice lessons, group voice classes, and group beginning piano classes are available each semester. Private lessons are one-half hour or one hour (for one or two credits) over a 15-week period. Group lessons consist of two 50-minute classes per week over a 15-week period (one credit).

\$160 per credit will be charged each student (for one or two credits). This is in addition to the tuition charged and will be billed separately during the course of the semester.

Any student enrolled in excess of 18 credit hours will be charged only the \$160 per credit hour for private lessons and not for additional tuition charges for the Music Performance Study course. Any other University course(s) that result in more than 18 credit hours of enrollment will be subject to the additional applicable per credit hour tuition charges.

#### School of Natural Resources Summer Field Courses

The tuition for the School of Natural Resources Summer Field Courses will be at the Summer Session credit hour rate. In addition, there may be charges for field expenses.

#### Additional Fees for Special Courses

Occasionally, a special fee will be charged in addition to the fee for tuition to cover long distance travel expenses, special equipment, arrangements, or skilled consultants. Students will be notified of this fee through the registration process.

#### Late Registration Fee

Students who are allowed to register after classes begin will be charged a \$10 late registration fee.

### FEES FOR PART-TIME STUDENTS

A comprehensive fee is charged to all part-time students enrolled in four but less than 12 credit hours in a semester, as follows:

Hours Enrolled Per Semester	Fee
4	\$35
5	39
6	43
7	47
8	51
9 to 11.5	55

All undergraduate degree students enrolled in four or more credit hours in a semester pay the full student activities fee.

## PAYMENT OF OBLIGATIONS

All tuition, fees, and room and board charges are payable in full upon notification. Degree students who enroll in advance for courses will receive itemized statements of applicable semester charges at their permanent addresses about a month prior to the commencement of classes, with instructions to settle in full by a specific due date, which is generally ten days before classes begin. Students who register in-person are expected to settle in full at that time. Advanced payments are accepted; checks should be made payable to the University of Vermont.

Students who cannot meet their financial obligations because of unusual circumstances should contact the Accounts Receivable Office as soon as possible before the due date.

Students who have not satisfactorily completed financial arrangements by the announced due date may have their enrollment terminated.

The University reserves the right to withhold registration material, the degree, and all information regarding the record, including transcript, of any student who is in arrears in the payment of fees or other charges, including student loans and dining and housing charges.

## LATE PAYMENT SERVICE CHARGE

Students who do not settle their accounts by the due date, and students who are allowed a payment postponement of all or a portion of their financial obligations, may be charged a \$50 late payment service charge.

## BUDGETED PAYMENT

The University offers payment plans (administered by the Richard Knight Agency) to parents who desire to budget annual costs in monthly installments. Specific information is mailed to parents of incoming students in the spring by the Accounts Receivable Office.

## BILL ADJUSTMENT AND REFUND POLICIES

### ACCEPTANCE FEE AND ADVANCE TUITION PAYMENT FOR NEW STUDENTS

A newly admitted undergraduate student who decides not to attend, and who notifies the University in writing prior to the first day of classes, will receive a refund of \$100 of the \$225 payment (acceptance fee of \$65 and advance tuition payment of \$160) which was required to reserve a place in the class.

### CANCELLATION, WITHDRAWAL, MEDICAL WITHDRAWAL, SUSPENSION, DISMISSAL

A student who cancels, withdraws for personal or medical reasons, is suspended, or is dismissed will receive a refund of tuition and fees in accordance with the following schedule. Medical withdrawals require the approval of the Student Health Center director.

- 100% refund before semester begins
- 80% refund prior to the end of the first two weeks of classes
- 40% refund during the third, fourth, or fifth week of classes
- No refund after the fifth week of classes

### CHANGES IN CREDIT HOUR LOAD

A student who *adds* courses during the semester will be billed

additional tuition and fees applicable to the adjusted credit hour load. A student who *drops* courses during the semester will receive a tuition refund (or credit adjustment) based upon the effective date as described above.

## REFUND OF OTHER CHARGES

Room and meal plan payments will be refunded on a prorated basis.

## DEATH

In the case of a student's death, tuition, room, and fees will be fully refunded for the semester during which the death occurs. Unused meal points will be refunded.

*Note:* The effective date of any cancellation or withdrawal is the date the student's dean receives such notification in writing. The dean may recommend to the Registrar that an exception be made to this refund policy only in extenuating circumstances. In no case will a refund be made after the first day of classes of the following semester.

## FINANCIAL AID

Many worthy and deserving students are unable to meet college expenses and for them the University provides, so far as its resources permit, aid in the form of scholarships, loans, and employment. On the basis of the financial aid application and the financial information accompanying it, applicants will be considered for all aid programs for which they are eligible. Aid is most often awarded in combinations or "packages" of the various types of aid. Almost all awards include some loan or work-study for which the student states a preference on the admissions application (if the student is a freshman or transfer student) and on the financial aid application (if the student is a continuing student).

## ELIGIBILITY FOR FINANCIAL AID

To be eligible to apply for financial aid, a student must be a U.S. citizen or in the U.S. for other than a temporary purpose with intent to become a permanent resident. A student must also be enrolled at least half-time (six credits) in a degree program. Audited courses cannot be considered as part of the credits in determining financial aid eligibility. Students who believe they are unable to meet college expenses are urged to apply to the Office of Financial Aid for assistance in the form of grants, loans, and employment. There is limited financial aid available for international students.

## FINANCIAL AID APPLICATION PROCEDURES

Incoming freshmen and transfer students who wish to apply for aid may do so by: (1) indicating their intention to apply for financial aid on the University of Vermont Application for Undergraduate Admission form, and (2) submitting the Financial Aid Form (FAF) to the College Scholarship Service in Princeton, New Jersey, (preferred) or the Family Financial Statement (FFS) directly to the American College Testing Program in Iowa City, Iowa. These forms may be obtained from local high schools or by request to the Office of Financial Aid, 330 Waterman Building, University of Vermont, Burlington, Vermont 05405. Preference is given to those students who submit their applications by March 1. Applications submitted after that date will be processed in chronological order, subject to the availability of funds.

Continuing upperclass students who wish to apply for aid may do so by submitting the Financial Aid Form (FAF) to the College Scholarship Service in Princeton, N.J. FAF forms are available early in the spring semester from the Office of Finan-



cial Aid. Preference is given to those students who have submitted their applications by May 1. Applications submitted after that date will be processed in chronological order, subject to the availability of funds.

ALL STUDENTS ARE REQUESTED TO APPLY to the Pell Grant Program (check appropriate section of the FAF or FFS) and their state agency (for Vermonters: Vermont Student Assistance Corporation (VSAC), P.O. Box 2000, Champlain Mill, Winooski, Vermont 05404.)

### FACTORS FOR DETERMINING FINANCIAL NEED

Financial aid funds are limited. Accordingly, all assistance offered by the Office of Financial Aid is based on a calculated determination of financial need which considers the following factors:

1. **STUDENT BUDGET**, includes tuition, required fees, room and board, books, supplies, and moderate personal expenses.
2. **EXPECTED PARENTAL CONTRIBUTION** of educational cost as determined by the financial information provided by parents on the financial aid application form (FAF or FFS).
3. **STUDENT RESOURCES**, usually from earnings, private loans, investments, or savings as reported on the financial aid application form (FAF or FFS).
4. **ASSISTANCE RECEIVED FROM OTHER SOURCES**, such as private scholarships/grants, state agency awards, etc.

### IMPACT OF ENROLLMENT STATUS CHANGE

For students receiving financial aid, change in student status or credit hour load may result in revision or loss of that financial aid, depending on the regulations of the particular aid programs involved; and, except when aid program regulations specify otherwise, any such change which reduces the student's University charges will usually result in a reduction of

the financial aid award. The reduction is prorated among all aid sources making up the award according to the applicable regulations. Such reduction of aid will usually require immediate repayment of the aid so reduced.

### SATISFACTORY ACADEMIC PROGRESS FOR FINANCIAL AID RECIPIENTS

Financial aid recipients must meet the University guidelines with regard to maintaining satisfactory academic progress. Students who do not maintain satisfactory academic progress could lose their eligibility for financial aid.

Specific information regarding the above can be obtained from the Office of Financial Aid.

### 1988-89 IN-STATE AND OUT-OF-STATE EDUCATIONAL COSTS

Standard student budgets for the 1988-89 academic year are shown below. Actual costs for subsequent years may be higher if tuition, fees, and/or housing costs increase.

	SINGLE	
	In-State	Out-of-State
Tuition	\$3,400	\$10,450
Fees	326	326
Room	2,348	2,348
Board*	1,500	1,500
Personal	790	790
Books/Supplies	<u>380</u>	<u>380</u>
Totals (Rounded)	\$8,740	\$15,790

\*Average cost reflects additional allowance for meals above minimum plan and is used for both on- and off-campus students.

The award of financial aid is administered in accordance with the guidelines on nondiscrimination as they appear on page ii.





# Student Life

## SERVICES

Students experience rapid personal growth while on the college campus. In addition to developing new academic skills, they are challenged to pursue new ideas, evaluate their value systems, change existing attitudes, and investigate new life styles. They explore future career options and learn social and interpersonal skills.

The broad focus of the Division of Student Affairs at the University of Vermont is to provide support services to students during this time of intense personal development and intellectual growth. In addition, Student Affairs plays a leadership role in developing experiences, policies, and programs to provide learning and leadership opportunities for students in concert with the formal instructional mission of the institution.

To accomplish this mission, the student life areas are divided into various functional departments and programs. Each of these provides or coordinates support services and educational experiences to meet student needs.

The offices of the Dean of Students are located in the Nicholson Building at 41 South Prospect Street.

## COUNSELING AND TESTING CENTER

The Counseling and Testing Center provides information, skills training, and encouragement for more effective living, personal growth, and improvement of academic capability. Services for simple or complex and severe concerns include individual, personal, social, and career counseling on a voluntary and confidential basis. Groups and workshops are designed to meet student requests in areas such as life planning, career development, stress management, confidence building, improving learning effectiveness, weight control, and other topics related to the growth of the whole person. Counselors and psychologists coordinate closely with Student Health Center staff to assist students in maintaining emotional and physical well-being.

The Center also coordinates various national testing programs and provides the opportunity to take, at cost, career interest tests and personality tests in conjunction with individual counseling. The professional staff of psychologists and counselors offers services on a no-fee basis to UVM students carrying five or more credits. The Center is accredited by the International Association of Counseling Services.

## DISABLED STUDENT SERVICES

The Office of Specialized Student Services works closely with students having physical or learning disabilities, securing solutions to problems encountered in their university experience. This includes providing assistance with necessary tasks (e.g. readers, interpreters, mobility aides, notetakers); academic, vocational, and personal counseling to encourage optimal independence and eventual employability; course accommodation; and a support system and structure where students can begin to effect changes on campus, community, and personal issues.

Prospective students with disabilities may contact the Coordinator of Specialized Student Services housed in the Counseling and Testing Center for assistance in making decisions and assessing their needs for future schooling. Incoming students should contact the OSSS in planning for housing, classroom, and mobility needs. Brochures describing the services at UVM for students with disabilities are available from the Office of Specialized Student Services.

The Counseling and Testing Center is located at 146 South Williams Street; (802) 656-3340; TTY (802) 656-3865 (Telecommunications for the deaf); TTY (802) 656-2625 (UVM Information Office).

## THE LEARNING COOPERATIVE

The Learning Cooperative represents a collaborative effort on the part of academic and student affairs offices to improve the ability of UVM students to benefit fully from their academic experiences. The Learning Cooperative supplements the academic environment by providing developmental instruction in writing, reading, and study skills. In addition, the Cooperative works with students to develop good learning strategies for challenging courses and maintains a campus-wide tutoring program.

The staff also helps students solve various administrative problems, such as locating sources of financial aid or understanding University accounting and course registration procedures.

Services of the Cooperative are available to all enrolled students. Participation begins by contacting the staff at 244 Commons, Living/Learning Center, or by calling (802) 656-4075. The Cooperative is open from 8 a.m. to 10 p.m. Monday through Thursday, 8 a.m. to 5 p.m. Friday, and 3 p.m. to 10 p.m. Sunday.

## Project STAY

Project STAY is a special services program at UVM and one of the offices contributing to the Learning Cooperative. Students selected to participate in STAY receive academic support which is in addition to that available to the student body as a whole. Participation is based on a student's financial need, status as a first generation college student, or because of a physical or learning disability. In addition to meeting the above criteria, a student must also show need for the program. Because the intent of the program is to provide personal and comprehensive services, only a limited number of students are selected each year.

Students interested in STAY should contact the office at the Learning Cooperative (address and phone listed above).

## CENTER FOR CAREER DEVELOPMENT

The Center for Career Development provides UVM students with comprehensive assistance in exploring and implementing their career goals. There are three major components in this effort: self-awareness, occupational/educational awareness, and job search skills development.

To pursue the first step, the Center staff offers two options: individual counseling appointments and group workshops to focus on choice of undergraduate or graduate study, or career. Staff assistance is available by appointment throughout the year. Students are encouraged to visit the Center to learn more.

Occupational awareness, the second component, can be pursued through a wide variety of programs. Part-time and summer employment opportunities are available to students attempting to gain experience in potential careers. For students interested in more structured experience, the office staff has developed a Cooperative Education Program to enable them to fully integrate their academic and career goals. UVM co-op students alternate eight- to ten-month periods of full-time paid employment with periods of classroom education. Co-op students work as close to campus as Burlington and as far away as Boston, Minnesota, and Florida. This program is integrated with the academic units in Agriculture and Life Sciences, Natural Resources, and Engineering, Mathematics, and Business Administration as well as other offices in Student Affairs.

Students will also find the information contained in the Career Resource Library helpful in developing their goals. The library contains literature on various fields, occupational outlooks, salary surveys which are updated four times per year, government opportunities at all levels, as well as a variety of literature describing current career opportunities in both large and small corporations in the private sector. The library also contains two

complete guides to all graduate programs in the country and a variety of graduate school catalogues from other universities. This information is expanding and is updated continuously.

After helping students develop some tentative direction, the office can also assist them in implementing their goals. Over 40 workshops are held each semester to teach students job search skills such as resume writing, interviewing, writing job search correspondence and developing a search strategy. In addition, the Center has a very active on-campus interviewing program which brings local, regional, and national employer representatives to campus for employment interviews. Individual appointments are always available to supplement workshops and programs in assisting students through an effective employment search program.

Students are encouraged to make use of the Center for Career Development early in their educational program.

The Center for Career Development is located in E Building, Living/Learning Center, (802) 656-3450.

### **Veteran Affairs**

As part of the Center for Career Development, this office provides support, coordination of services, and advising to any veteran or dependent eligible for benefits under Federal Law, Chapters 31, 32, 34, or 35. Students eligible for these benefits should contact the office at least one month prior to registration each semester. Students wishing to register for benefits should be prepared to present their certificate of eligibility to the Veterans Coordinator.

It is important that all veterans and dependents keep in contact with this office for the latest information regarding benefits and requirements. Also, those students involved in the Veterans Program should contact this office in the event of any change in credit load, dependency status, address, or major.

### **Preprofessional Advising**

The Preprofessional Advising Program provides assistance and support to all students preparing to enter graduate programs. General counseling, advising, and referral services are available to students with academic and nonacademic questions and concerns.

The Preprofessional Advisor has expertise in dealing with students interested in health fields such as medicine, dentistry, optometry, podiatry, and osteopathy. The advisor works in coordination with the Pre-Health Advisory Committee in preparing student letters of evaluation required by the majority of medical, dental, and health professional schools as part of the application process.

Pre-Law Advising is available to assist students with their decisions to attend law school and with the application process.

Materials for registration for the required preprofessional examinations and application services are available as is a resource library containing professional school catalogues.

## **CENTER FOR SERVICE-LEARNING**

The Center provides structured experiential programs and volunteer placements within the context of public service. Students may develop personal, professional, and leadership competencies in an internship or volunteer experience.

The Vermont Internship Program includes the Intensive, Semester, and Field Studies Internships. Internships may include a stipend, academic credit appropriate to a student's individual plan for graduation, participation in a core seminar or learning contract with faculty, and may be in Vermont, out of state, or in an international setting. Internships should be plan-

ned at least one semester prior to participation and before pre-registration. Center for Service-Learning staff provides work plans, learning contracts, and financial planning. Information interviews are conducted to assist students in organizing a structured internship plan. Coordination and support services are provided by the Center.

The Volunteer Program provides several ways for students to get involved on campus and in the community as a volunteer. Individual placements as well as group projects are provided, ranging from one-time to year-long commitments. The Center also assists the UVM Volunteers in Action (VIA) program, a Student Association sponsored organization that coordinates student-run volunteer projects such as Big Brother/Big Sister, Adopt-A-Grandparent, Special Olympics, Vermont Children's Magazine, Volunteers for Youth, and the UVM Prison Project.

The CSL Resource Library contains information about community volunteer and national and international work service internships.

The Center for Service-Learning is located at 41 South Prospect Street, (802) 656-2062.

## **MINORITY STUDENT PROGRAM**

The mission of the Minority Student Program is to meet the University's commitment to create a diversified academic community. The purpose is twofold: to encourage and increase the enrollment of minority students at the University and to provide a support system consisting of both academic and social components for those students who may be in need of such services. Special tutorial services as well as nonacademic counseling and advising are provided.

Spring Visitation Weekend provides an opportunity for prospective minority students who have been accepted for admission to live on campus for an extended weekend. Once the student decides to attend UVM, a one-month college preparatory program is offered during the summer prior to fall enrollment (Summer Enrichment Program).

The offices of the Minority Student Program are located in the Center for Cultural Pluralism and at 41 South Prospect Street, (802) 656-3380.

### **Center for Cultural Pluralism**

The Center develops and promotes programs to enhance cultural awareness on campus and within the local community. Student involvement in the planning and facilitation of such programs is a primary goal. Programs range from educational colloquia and cultural dinners to sponsored campus/community-wide ethnic weeks. Guest speakers, films, and cultural performances help bring campus attention to the Afro-American, Asian-American, Hispanic American, and Native American portions of our past and present day American society. Past programs have included Dith Pran, Mary Berry, the UVM Afro-American Dance Troupe and speakers such as Reverend Ralph Abernathy, Russell Means, Curtis Sliwa, Benjamin Hooks, Dick Gregory, and Shirley Chisholm. The Center serves as a gathering place where members of the academic community can meet and share their cultural heritage through a variety of social, cultural, and educational events. The Center for Cultural Pluralism also provides a place where students can come to relax and study. Typewriters, a copy machine, television, computer facilities, and even a kitchen are available for any UVM student to use. By providing special programs to increase cultural awareness and appreciation on campus and within the community, the Center serves an important mission of being "a place of sharing."

The Center for Cultural Pluralism is located in Blundell House, (802) 656-3819.

## STUDENT HEALTH CENTER

The Student Health Center is available to all students (except those in the College of Medicine) for primary and preventive health care. A comprehensive program has been developed to meet the needs of college students and includes medical, gynecological, and orthopedic clinics; physical therapy and sports therapy programs; a wellness promotion program; a drug and alcohol education program; and some laboratory services. Most of these services are covered by the health fee (see page 15). Students entering the University are required to furnish the Health Center with a complete medical history which includes immunization dates. A physical exam is not required.

Because the College of Medicine is located on campus, the Burlington area has a large and sophisticated medical community of which the Health Center is a part. Students requiring consultations are referred to specialists in the area. When necessary, hospitalization is usually arranged at the Medical Center Hospital of Vermont which is a teaching hospital located on the edge of the main campus.

The University also makes available to students an optional health insurance plan which provides hospitalization and some outpatient benefits. It is strongly advised that all students attending the University have adequate hospitalization insurance.

## SPEECH AND HEARING CENTER

The E.M. Luse Center for Communication Disorders of the Department of Communication Science and Disorders offers diagnostic and treatment services at very nominal cost to all students of the University for communication disorders such as: hearing loss; selection and use of hearing aids; stuttering; voicing, language, and articulation disorders, etc.

The Luse Center is located in Allen House, (802) 656-3861.

## ACTIVITIES

Participation in extracurricular activities is a vital part of a student's education at the University. To further this end, the Student Activities Office assists students in developing educational and cultural programs and in managing the operations of their organizations. In addition, the Division of Student Affairs offers an increasingly comprehensive leadership program that encourages not only individual growth, but organizational development.

The Student Association, the primary student governing organization, assumes responsibility for voicing student concerns and interests in the political activities of the University community. It also recognizes and funds approximately 110 student organizations, including the student newspaper, *The Vermont Cynic*; the yearbook, *The Ariel*; WRUV, the student-operated radio station; UVM Rescue Squad; and the Student Legal Service; in addition to a host of political, religious, service, program, honorary, and recreational groups. A complete listing of student organizations and religious groups can be found in *The Cat's Tale: A Student's Guide to the University of Vermont*.

The Greek system is an integral part of campus life. Fourteen fraternities and six sororities, representing both national and local organizations, maintain active communities at UVM.

Extracurricular life focuses on Billings-Ira Allen Campus Center which houses a number of student organizations and provides space for meetings, lectures, films, and other programs.

The Student Activities Office, the Student Association Office, and other student organizations are located in Billings Center.

## INTER-RESIDENCE ASSOCIATION (IRA)

The Inter-Residence Association represents the students living

in University residence halls. The government, consisting of an executive board, legislative council, and judicial board, provides leadership for residence hall students, representing their interests to other constituencies within the University community. IRA involves itself in all aspects of residence hall life, constantly seeking new ideas and avenues for the manifestation of these ideas to make the residence halls meet the needs of its residents.

## HONORARY AND RECOGNITION SOCIETIES

Honorary and recognition societies at the University of Vermont recognize student contributions to the University community and their leadership in campus life.

University honorary societies include Boulder Society, which acknowledges outstanding senior men; and TOWERR, which acknowledges outstanding senior women.

National honorary societies represented on the University campus are as follows:

The Phi Beta Kappa Society established the Vermont Alpha Chapter at the University in 1848, and initiates are chosen primarily on the basis of high scholastic standing with emphasis on a broad distribution of liberal studies. A detailed statement of the criteria used is available from the chapter president. The local chapter was the first in Phi Beta Kappa to initiate women into membership.

Mortar Board is a national society for senior women and men. Although membership in Mortar Board comes as a high honor for a University of Vermont student in recognition of outstanding service, scholarship, and leadership, it is also a challenge for continued unselfish service in the best interests of the college campus.

The Society of the Sigma Xi, established at the University in 1945, initiates those who have proven their ability to do research in one of the sciences, including students who have a high scholastic standing.

Other national honorary societies include: Alpha Omega Alpha, medicine; Alpha Zeta, agriculture; Kappa Delta Pi, education; Tau Beta Pi, engineering; Omicron Nu, home economics; Delta Sigma Rho-Tau Kappa Alpha, debating; Phi Alpha Theta, history; Eta Sigma Phi (Iota Chapter), classical studies; Alpha Kappa Delta, sociology; Sigma Phi Alpha, dental hygiene; Chi Epsilon, civil engineering; Xi Sigma Pi, natural resources; Ethan Allen Rifles, outstanding students in the Reserve Officers' Training Corps; Champlain Sabres, a military fraternity; and Phi Eta Sigma, outstanding freshmen.

## ATHLETICS AND RECREATIONAL SPORTS

The University encourages and supports a variety of sports at various participatory levels. All full-time undergraduate students are eligible to try out for varsity sports and are encouraged to participate in all levels of sports activities. High student interest in athletic activities has placed a great demand on facilities. To help meet this demand, a new dance studio, gymnastics/combat sports, and multipurpose building was completed in early 1982.

Athletic eligibility is determined by the Director of Athletics. All varsity athletes must comply with all appropriate rules and regulations of the University of Vermont, NCAA, ECAC, and those of the playing conferences with which UVM is affiliated. Each prospective student-athlete and current student-athlete must take a physical exam and be cleared by the UVM Student Health Center prior to participating in team activities including practice, preseason conditioning, and contests.

The athletic policies of the University are developed by the Athletic Council, an advisory board to the President of the University composed of faculty, students, and alumni. Athletic relations are maintained with NCAA, ECAC, and NECAC.





Opportunities exist in the traditional seasonal sports for all students who are eligible to compete. In the fall, the programs offered to male students include soccer, cross-country running, golf, and tennis. The programs offered in the fall to women students include field hockey, soccer, cross-country running, tennis, and volleyball. Winter programs for both men and women include basketball, skiing, swimming, gymnastics, and indoor track. A hockey program for men is also included in the winter. The spring programs for men include baseball, lacrosse, tennis, and outdoor track. Women's spring programs include softball, lacrosse, and outdoor track.

Programs range in strength from the national level, such as skiing, to the New England regional level. All prospective students interested in obtaining information concerning a particular sport should contact the coach of that sport.

Club sports provide the opportunity for a group of students to participate in a wider variety of competitive activities. All full-time undergraduate students are eligible to participate in any of the various clubs. Emphasis is placed on student leadership and, within each club, members have the opportunity to become involved in the organizing, administering, and supervising of the club's activities. Club sports include women's ice hockey, women's indoor soccer, women's indoor field hockey, ultimate frisbee, fencing, cycling, volleyball, gymnastics, cheerleading, crew, karate, men's wrestling, men's indoor soccer and men's rugby.

Competitive sports are a desirable part of a student's program of education. The recreational sports program aims to fulfill this responsibility by serving all students. A wide variety of 48 intramural activities is offered, and all students taking four or more credits are eligible to participate in as many activities as they choose. Teams may be organized from any residence hall, fraternity, sorority, or independent source.

Recreational facilities are available every day to provide students the opportunity to drop in and participate informally in activities which interest them. Racquetball, tennis, and squash courts are used on a reservation basis, while the basketball courts are used on a first-come, first-served basis. In addition, students are free to use the pool, rink, weight room, and track whenever these areas are open for recreational hours.

Each semester the Recreational Sports Program offers a full schedule of fitness-oriented programs (yoga, aerobic exercise, stretch, and relaxation). Registration takes place during the first week of classes and the programs run for 12 weeks. For specific program information, please call the Recreational Sports Office, 656-4485.

## **THEATRE**

The Royall Tyler Theatre is the home for the season of plays presented by the Department of Theatre and the Champlain Shakespeare Festival.

In its belief that the arts are vital to individuals as well as civilizations, the Department presents the fruits of the artistic work of students and faculty alike. Within the context of a liberal arts college, the Theatre program in the classroom and on the stage and public platform attempts to expose its audience to its theatrical heritage. A rich curriculum is enhanced by an adventurous production schedule. The Department also offers courses and activities in public speaking and debate, the excellence of which are nationally recognized. All members of the University community are encouraged to participate in these programs and to share the Department's commitment to vital living theatre.

## **DEBATE**

The Lawrence Debate Union provides an opportunity for interested students to participate in intercollegiate forensics.

Members of the LDU attend debate tournaments throughout the nation, each year engaging in over 250 debates at more than a dozen tournaments. Competition of this caliber teaches the student the skills of efficient research, rigorous thought, and effective communication. The program is designed to develop the abilities of both the experienced debater and the beginner. Outstanding performers receive recognition in the form of annual awards and by election to Delta Sigma Rho-Tau Kappa Alpha, the national forensic honor society.

## **MUSIC**

Opportunities for participation and appreciation are provided for students with strong musical interests. The University Mixed Choir, Choral Union, and Women's Choir are open by audition to students seeking participation in choral ensembles. The University Band, Jazz Band, Vermont Winds, Brass, Tuba, and Percussion ensembles, Trombone Choir, and University Orchestra provide performance opportunities for instrumentalists. All perform in various public presentations during the year. On occasion, the Choir and Choral Union have been invited to perform with the Vermont Symphony Orchestra; the University Pep Band performs at athletic events, and the Band mounts a spring tour. The University Orchestra presents several varied concerts of standard orchestral literature plus concertos featuring outstanding music students or combines forces with the vocal ensembles for presentation of major choral works.

In addition to the larger ensembles, faculty and senior recitals, special departmental concerts, and guest artists are scheduled throughout the school year. Individual instruction on various orchestral instruments, piano, organ, harpsichord and voice, may be arranged (contact the Music Department office for specific information).

The offices of the Music Department are located in the Music Building on Redstone Campus. An important feature of this facility is its beautiful recital hall which houses the C.B. Fisk organ, one of the finest instruments in the Northeast. The Music Department serves as a showcase for the musical talents of the music majors and the faculty, as well as for those students seeking musical activity as a part of their extracurricular life on campus.

## **THE GEORGE BISHOP LANE ARTISTS' SERIES**

*"...The George Bishop Lane Artists' Series should include musical productions and...other theatrical and artistic productions (and) should be open to the students of the University of Vermont and the public generally..."*

*—from the will of Mrs. George B. Lane (April 27, 1954)*

Since Mrs. Nellie Lane's generous bequest to the University, the Lane Series has presented well over 800 concert and stage productions. More than one million tickets have been purchased for performances that have included the major artists, entertainers, and performances of the time.

Each Lane Series season has presented a carefully balanced program of the best in classical music, dance, opera, the theatre, and jazz, rock, and/or folk music. Performances have included such orchestras as the Chicago Symphony under the direction of Sir Georg Solti, and the London Symphony Orchestra under Herbert Von Karajan; dance has included such events as a full-length *Sleeping Beauty* with Dame Margot Fonteyn, the Bejart Ballet du XXieme Siecle, Alvin Ailey, and the Joffrey Ballet. Jazz and popular music have been an important part of the Lane Season with appearances by Ella Fitzgerald, Duke Ellington, Simon and Garfunkle, and Joan Baez and Bob Dylan's Rolling Thunder Revue. Soloists have been a prominent feature of the Lane Series with appearances by Arthur Rubinstein, Marcel Marceau, Beverly Sills, Lily Tomlin, and Andres Segovia.

Active not only in Burlington, the Lane Series has maintained state-wide activities over the years with series in St. Johnsbury, Brattleboro, and Springfield. In 1973, the Lane Series helped found and manage the Vermont Mozart Festival, and in the summer of 1976 helped found Stowe Performing Arts, a festival of outdoor events in Vermont's ski capital. The Lane Series led the way to the establishment of New England Presentors, the membership of which represents virtually all of the performing arts in New England. In 1980, the National Endowment for the Arts, through the Vermont Council on the Arts, awarded to the Lane Series a \$100,000 Challenge Grant for the purpose of enlarging the Series' endowment. During the 1985-86 season, the Lane Series celebrated its 30th Anniversary with gala performances by Rudolf Serkin, Yo-Yo Ma, James Galway, and Itzhak Perlman.

The Lane Series serves a wide audience: students, faculty and staff, and the community at large. A certain number of tickets for most events are available at \$5 so that all students and members of the community are able to attend the Lane Series' events. The Lane Series regularly schedules master classes and workshops, open to the UVM community for free or minimal charge. Students can also volunteer to usher at Lane Series' events.

The Lane Series is managed by a staff of six and is advised by a 100-member Friends Council. Offices are located at 460 South Prospect Street and the telephone number is (802) 656-4455. The major ticket sales outlet is the Campus Ticket Store (UVM Bookstore, 656-3085) which accepts telephone/mail orders using MasterCard/Visa.

### **CHURCH STREET CENTER FOR COMMUNITY EDUCATION**

The Center, located in the restored Ethan Allen Firehouse on Burlington's Church Street, offers over 100 noncredit mini-courses and workshops each quarterly session and operates a program of lectures, films, readings, and exhibits. The Center also serves as a clearinghouse for information on University and community educational activities. It draws upon the combined talents and resources of the University and the larger community. The Center also offers students the opportunity for challenging work/study, internship, and practicum assignments.

### **SOCIAL SCIENCE RESEARCH CENTER**

The Social Science Research Center provides research facilities for members of the University community. The SSRC is operated by the Center for Rural Studies in the College of Agriculture and Life Sciences and the University Computing Services as a data archive, research facility, and a teaching resource. The Center is the depository of data sets made available to the University by the Inter-University Consortium for Political and Social Research. In addition, the Center holds data from other sources, including the U.S. Census Bureau, state agencies, and UVM researchers. The Center's archives are available to any UVM student or faculty member. Advanced students provide assistance for faculty and student projects. The SSRC library of data and manuals is located at 137 Hills Building. Anyone who feels the SSRC's resources might be of use is urged to drop by or call the Director at (802) 656-3021.

### **CENTER FOR AREA AND INTERNATIONAL STUDIES**

The Center for Area and International Studies is an interdepartmental activity with a director and six programs, each of which has its own director. The purposes of the Center are to encourage and coordinate interdisciplinary and comparative study and research for selected foreign areas. The Center also

sponsors interdisciplinary seminars and guest lectures. The Center for Area and International Studies administers the program of concentration in Area Studies and offers the B.A. degree in the College of Arts and Sciences.

### **CENTER FOR RURAL STUDIES**

The Center for Rural Studies in the College of Agriculture and Life Sciences addresses critical social, economic, and resource issues in Vermont, rural areas of the U.S., and in developing nations. Primary emphasis is on research and organizing activities which contribute solutions to rural problems. Through interdisciplinary research, the Center bridges the gap between the academy and the community, involving students, community leaders, government officials, political activists, and the private sector, as well as University faculty.

Research skills range from primary data collection and the analysis of secondary data to field work in rural economic development. The Center has developed expertise in helping communities conduct surveys, needs assessments, and social impact analyses. Internships, special studies, course work, and/or paying jobs are available to interested and motivated students.

### **HOUSING**

Any student may apply to live in University residence halls but priority is given to full-time undergraduate students. All freshman students, except those living at home (in Chittenden County) and commuting, or those living with their spouses, must live in University housing. The department must be notified of such status in writing by June 30. Housing is guaranteed for all freshmen who meet appropriate deadlines. Housing is not guaranteed for upperclass students and is determined by a lottery held in the spring of each year. Upperclass students who are actives or pledges of a fraternity or a sorority may register for University residence hall housing or chapter housing.

On-campus housing is generally available to transfer students entering UVM for the fall or spring semester, though it is not guaranteed. In recent years, many transfer students have been offered housing for both fall and spring semesters. However, transfer students are urged to apply for housing with the Office of Residential Life as soon as they are accepted by returning the wait list card they receive with their acceptance letter.

### **RESIDENCE HALLS**

A residence hall is more than a place to sleep, store one's belongings, and study. It is a place where students can take advantage of the various opportunities and experiences surrounding them. A diversity of residence halls and programs are offered. There are freshman halls, upperclass halls, coed halls, single-sex halls, an environmental hall, and the Living/Learning Center (additional information on the Living/Learning Center is on page 42). Each residence hall is under the guidance and direction of a Hall Advisor assisted by specially selected undergraduate Resident Assistants. They encourage the development of intellectual, social, and cultural programs and assist the residents in their growth toward maturity and responsible self-direction. Students in the residence halls are members of their residence hall student government which represents student opinion and provides educational and social programs for its constituents.

All students living in the residence halls must have board contracts. Contracts for room and board are binding for the college year unless cancelled for due cause with the approval of the Office of Residential Life. In August, each new student will receive notification of a housing assignment and the date of the opening of the residence halls. Rooms may not be occupied



until the date specified. Students are expected to leave the residence halls not later than 24 hours after their last examination or by 8:00 p.m. on the last day of final examinations.

Student rooms are equipped for comfortable residence hall living. Each double room has two beds with mattress pads, two desks and chairs, bureau space for each student, two closets, and blinds or shades on the windows. Bookshelves are provided in some rooms. Students provide their own bed linen, towels, window draperies, pillows, wastebaskets, bureau covers, desk lamps, and reading lamps. Facilities for doing personal laundry are provided in residence areas as well as some space for storage of trunks, baggage, bicycles, and skis during the academic year.

The Department of Residential Life is located in Robinson Hall on the Redstone Campus, (802) 656-3434.

### **MARRIED STUDENT HOUSING**

There are 131 University-owned apartments designated for married students located just outside Winooski at Fort Ethan Allen. About five miles from Campus on Route 15, the apartments are close to a shopping center, hospitals, and educational institutions. These apartments are divided into two complexes.

County Apartments, completed in 1970, consist of 89 unfurnished units: 42 two-bedroom apartments on either the first or second floor, 14 one-bedroom apartments on the first floor, and 33 two-bedroom townhouse apartments in 11 two-story buildings. Located in the center of these buildings is a Community Center containing laundry facilities and a large multi-purpose room. There are three parking areas within this complex. Each apartment is furnished with an electric stove,

refrigerator, water heater, kitchen cabinets, shelves, garbage disposal, and wall-to-wall carpeting. The apartments are heated electrically and each room is individually controlled.

The other section, called Ethan Allen Apartments, is former military officers' quarters built between 1895 and 1933. There are 15 buildings with one to five apartments in each. Thirty-one apartments in this complex have two bedrooms, and 11 have three bedrooms. Many have basement or attic storage areas. These apartments have no carpeting, but stoves, refrigerators, and garbage disposals are provided. The cost of the fuel oil heating is included in the rent of about half the apartments. In the others, the tenants are billed directly by the University.

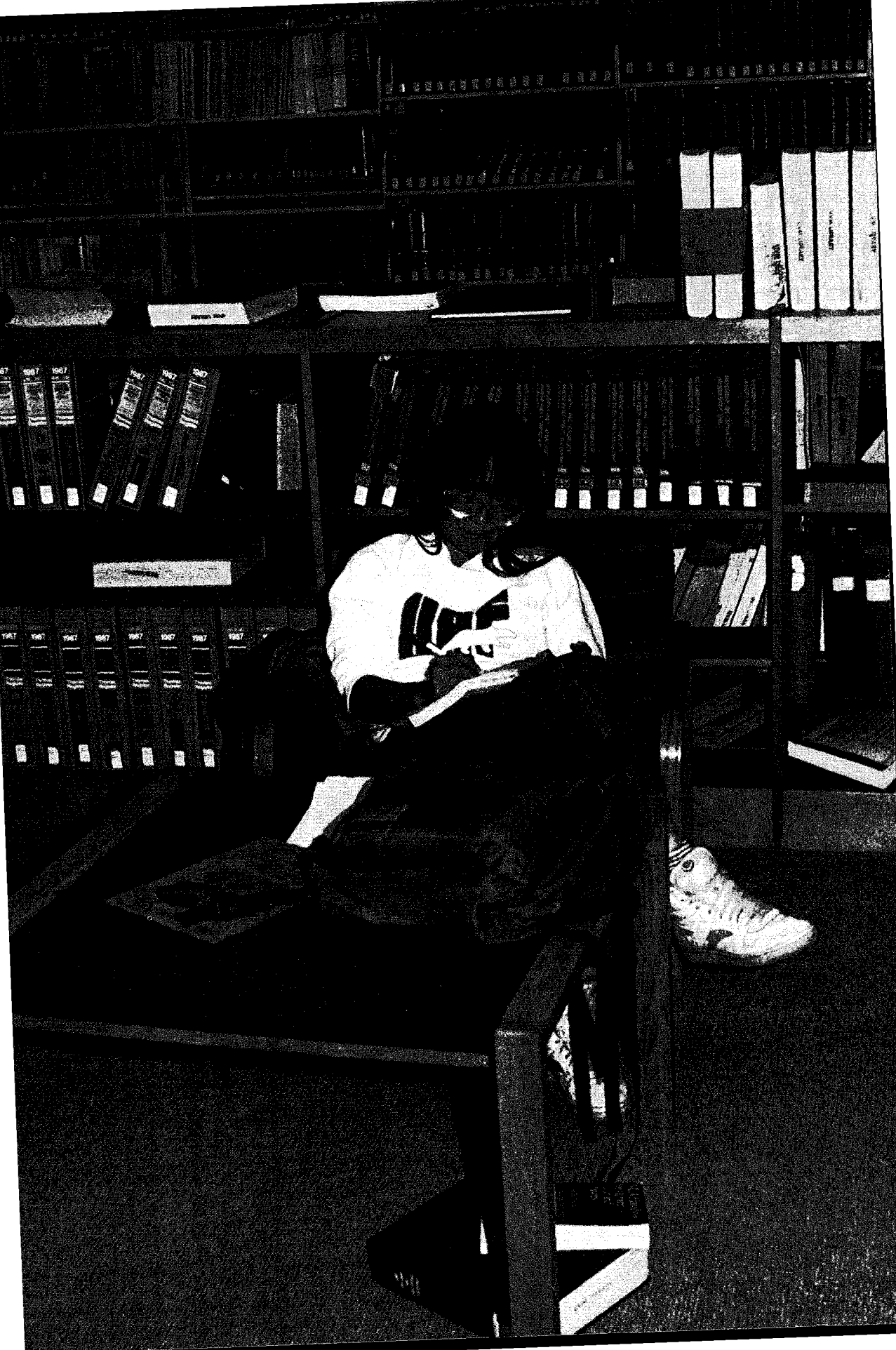
Detailed rental information may be obtained from the Ethan Allen Housing Office, 1007-0 Ethan Allen Avenue, Fort Ethan Allen, Winooski, Vermont 05404, (802) 656-0661.

### **OFF-CAMPUS HOUSING**

University students eligible to live off campus may utilize the facilities at the Office of Residential Life in locating housing in the greater Burlington area. This office provides a free listing service through which community landlords list apartments, houses, and rooms that are available for students.

Students who have a living situation to share may list for a roommate. Persons who need a roommate situation may also list their availability.

The listing is available at the Office of Residential Life between the hours of 8:00 a.m. and 4:30 p.m. Monday through Friday. It is impractical to give individual listings information by phone or mail.



# General Information

This section offers a summary of regulations and procedures. In addition to the information presented here, the rights and responsibilities of students and University policy on these and other matters are explained in detail in *The Cat's Tale: A Student's Guide to the University of Vermont*. Students are responsible for knowledge and observance of these regulations and procedures.

## REGISTRATION

Students in attendance must preregister for the next semester at the designated time. Unless excused in advance by the dean of the college/school concerned, students who do not preregister will be considered as dropped and may apply for readmission after one semester. Specific directions are published for each semester.

Written approval of the student's dean is required to preregister for more than 18 credit hours.

## ACADEMIC ADVISING

Effective academic advising involves an established rapport between student and teacher. Accordingly, each new student is assigned to a faculty advisor upon admission to the University. The student remains under the guidance of this advisor until a major has been selected, usually during the sophomore year at which time a departmental advisor will be assigned. Students with questions about academic planning should consult their advisor throughout the year and especially during the preregistration period. To change academic advisors, students should contact the dean of their college/school. Each academic unit within the University maintains its own system for advising students.

## ADVISING RESOURCES

In addition to an assigned faculty advisor, there are a variety of other advising resources available to University undergraduates.

**The Learning Cooperative:** represents a collaborative effort on the part of academic and student affairs offices to improve the ability of students to benefit fully from their academic experiences. The Learning Coop supplements the academic environment by providing developmental instruction in writing, reading, and study skills, works with students to develop good learning strategies for challenging courses, and maintains a campus-wide tutoring program.

**Prehealth Advisor:** assists undergraduate students with the admissions requirements for dental and medical school. A library of resource materials is maintained which includes literature on alternative health careers, school catalogues, and premedical education journals.

**Prelaw Advising:** The UVM Prelaw Committee assists students by providing meetings and panel discussions regarding career options in law. Advising also includes specific information on applying to law schools. A current collection of law school catalogues is maintained for interested students.

**Preveterinary Advising:** is available to discuss plans for graduate school and employment in animal science career areas. A selection of catalogues, pamphlets, and other related literature is maintained.

**International Students and Scholars Advising:** verifies immigration status, interprets immigration laws and immigration forms to foreign students, faculty, and scholars. American students planning to study abroad should also make their

plans through this office which is located at B161, Living/Learning Center.

**Minority Student Advising:** assists students entering the University who demonstrate that additional support services are needed. Incoming freshman minority students may elect to take part in a "Summer Enrichment Program" held on campus for a month (three credits).

**Center for Career Development:** assists students who are exploring a variety of potential career options early in their academic careers. A library of career information and school catalogues is maintained.

**Veterans Affairs Advising:** advises students of their G.I. Bill benefits in education. Counseling and referral on academic matters are available to veterans.

## ADD/DROP/WITHDRAWAL

1. Courses may be added or dropped only during the first two weeks of classes. After the first week of classes, the instructor may refuse to allow the add if certain material may not be made up (e.g. laboratories) and the loss of this work would seriously affect the quality of educational experience gained by the student in the course. In any case, faculty are not required to give make-up exams, papers, or quizzes.
2. No drops will be allowed after the second week except in cases where the student is enrolled by administrative error and has not attended the course. The disposition of such cases is handled entirely by the Registrar's Office.
3. From the end of the second week to the end of the ninth week of classes, students may withdraw from courses. Students who wish to withdraw fill out the course withdrawal form, consult with their advisor, and submit the form to the instructor. The instructor records an evaluation of the student's work. The evaluation options are shown below:
  - WP: Withdraw passing
  - WF: Withdraw failing
  - W: Withdraw (see 7 below)The instructor sends one copy to the Registrar to be recorded on the permanent academic record. Students give a copy to their dean for information purposes. The instructor also records the withdrawal grade (W, WP, or WF) on the final grade sheet which is sent to the Registrar.
4. Between the end of the ninth week and the last day of classes, students may withdraw from one or more courses only by demonstrating to their college or school studies committee, through a written petitionary process, that they are unable to continue in the course(s) *due to circumstances beyond their control*. Such petition must contain conclusive evidence, properly documented, of the illness or other situation which prevents completion of the course(s). Acceptable reasons do not include dissatisfaction with performance or expected grade, with the course or instructor, or desire to change major or program. If the petition is approved, a grade(s) of "W," "WP," or "WF" will be assigned by the instructor(s) and recorded on the student's permanent record. If the petition is denied, the instructor(s) will assign a final grade ("A"—"F") in accordance with the same criteria applied to all other students in the course(s).

Students wishing to withdraw for medical reasons must contact their dean.
5. No withdrawals are permitted after the last day of classes.
6. The grades of W and WP will not enter into the grade-point average. The grade of WF will enter the GPA as an F.
7. The grade of "W" is assigned when the faculty member has no evidence upon which to base a WF or WP.

## PASS/NO PASS

PASS/NO PASS course enrollments were approved by the University Senate for implementation in September 1968 to en-

courage students to take elective courses they might otherwise avoid for fear of a low grade, to encourage work for internal rather than external goals, and to stimulate intellectual exploration. The action was taken in two parts:

FIRST, that any degree program students, not on academic trial, be permitted to take as many as six courses (three courses for two-year students; or as many courses as they have semesters remaining for future transfer students) during their undergraduate career on a pass/no pass basis, beginning in the sophomore year (second semester of the first year for two-year students). These courses may not include any required by the student's major department, either for the major or for the degree. Only *free electives* (without condition) may be taken as pass/no pass. This option may *not* be used for electives within the distribution requirements of a college or department. Students who enrolled in ineligible distribution elective courses on a pass/no pass basis prior to September 1, 1974, shall not be penalized. Students must complete all work normally required in these courses to receive full credit toward graduation for passing them. The instructor will *not* be informed of the student's status and the Registrar will record grades of "D" or higher as PASS and grades of "F" as NO PASS. Neither "P" nor "NP" grades will affect the student's grade-point average. The grade submitted by the instructor will not become available to the student nor to any third party.

SECOND, that the following addition was approved by the Faculty Senate in January 1974: Physical education (activity) courses, whether taken to fulfill a requirement or as electives, will be available to students on a pass/no pass basis and shall not be counted as a part of the six standard courses described above.

#### *Procedure:*

1. A PASS/NO PASS Request Form is obtained from the Registrar's Office and the academic advisor is consulted.
2. The advisor's endorsement that the request conforms to the policy established by the University Senate is obtained. Any question about a course or courses being appropriately elected as pass/no pass for a student will be resolved by the student's college/school dean.
3. The request to be placed on pass/no pass status is submitted to the Registrar's Office during the first week of the semester. Requests to be removed from that status must be filed during the same period.

*Note:* Nondegree students may not take courses on pass/no pass basis.

## AUDITING COURSES

With the approval of the dean and the instructor concerned, a regularly enrolled student carrying a normal program may audit a course. Others who do not wish to receive credit, or who have not met admission requirements, may also register as auditors. Auditors have no claim on the time or service of the instructor. A student wishing to audit a credit course must meet minimum levels of performance set by the instructor at the time of registration in order to receive an audit grade on a transcript. No grade credit is given for the work. Tuition is charged at the applicable rate. Under no circumstances will a change be made after the enrollment period to allow credit for courses audited.

The approval of the Director of Continuing Education is necessary for auditing courses in the Evening Division or Summer Session.

## GUIDELINES FOR INDEPENDENT STUDIES

1. Independent study is an educational experience (taken for credit) which occurs outside the traditional "classroom/laboratory" setting. The project is faculty supervised and tailored to fit the interests of a specific student.
2. Independent study will be under the direct supervision of a faculty member having expertise in the area of investigation and consequently the project will be done in the department which is primarily responsible for the field of study in question.
3. Prior to enrollment in independent study, students must obtain the approval of their advisor, faculty sponsor, and the faculty sponsor's department chairperson.
4. Independent study may be taken for variable credit. The amount of credit to be granted should be mutually agreed upon by the student and the faculty sponsor at the time of enrollment.
5. When a project is to cover more than one term, the XC (extended course), rather than incomplete, should be used for the first term of work.
6. All departments in which a student may obtain "service learning" or "field experience" credit should list this option in their description of courses. If a department offers the opportunity for both "Readings and Research" and "Field Experience" (service learning, internships, etc.), these offerings should have different course numbers, titles, and catalogue descriptions. In the *rare* instance where one cannot differentiate between these two offerings, they may be listed under the same name.
7. All academic units offering independent study courses will be responsible for administering such work. Specific guidelines which define the responsibilities of both faculty and student in terms of administering the independent study project are given in Part 8. Alternative guidelines which incorporate the basic points in Part 8 are acceptable.
8. Procedure:
  - a. The success of an independent study project is often related to the amount of advanced planning expended on the project. Consequently, planning for the project should, whenever possible, be initiated in the semester before the course is taken.
  - b. By the end of the add/drop period, students will be required to submit to their faculty sponsor a specific plan which must include, but not be limited to, the following:
    - i. The project title.
    - ii. A statement of justification, indicating why independent study is being selected and the reason for undertaking the project, its importance, and how it relates to other work done by the student.
    - iii. A clear and complete statement of project objectives.
    - iv. A concise statement of the plans and methods to be used in order to accomplish each objective.
  - c. During the first full week of classes the student and the faculty sponsor will meet and prepare a document which includes the following:
    - i. A schedule of dates when the student and faculty member will meet and discuss progress, including a time plan indicating when various parts of the work are projected for completion.
    - ii. A list of those ways in which documentation of work can be shown.
    - iii. A plan for evaluation, which will include the specific work to be submitted for evaluation on the project, and a statement of criteria to be used for evaluation, will also be included.
  - d. It is the responsibility of the faculty supervisor to ensure that all the provisions in numbers 7 and 8 above have been satisfactorily accomplished. Copies of all documents and schedules mentioned in 8.b and 8.c must be filed with the department chairperson by the end of the add/drop period. Completed projects, along with faculty evaluations, should be retained in the faculty member's files, to be available for review, if necessary, by appropriate school and college committees.

## REPEATED COURSES

Students who repeat a course lose any previous credit on record for that course. The previous grade remains on the permanent academic record and is included in computing cumulative grade-point average.

## CLASS ATTENDANCE

Students are expected to attend all regularly scheduled classes. This is a major responsibility of students toward themselves and toward the University. The primary penalty for nonattendance results in a lessened grasp of the subject matter of the course. It is the responsibility of the student to inform the instructor regarding reason for absence from class.

Any student who fails to attend a scheduled course by the third instructional day of a semester or the second scheduled class session of a course, whichever comes later, without giving prior notification to the instructor, may be disenrolled. In such cases, the instructor shall notify the Registrar who will remove the student's name from the class list and the course from the student's schedule.

Each department is to inform all students in its classes at the beginning of each semester of its policy for handling absences and the penalties that may be imposed.

Failure to do any work for which a grade is given, if due to unexcused absence, may result in a failing grade for that particular work.

*Tardiness:* A student not present at the beginning of an exercise may be marked absent.

*Right of Appeal:* Students who believe that they have been unfairly treated in regard to absences may appeal to their academic dean.

*Medical Excuses:* The Student Health Center provides medical excuses by providing documentation to students who are hospitalized or who are advised by the Health Center staff to restrict their activities because of illness or injury. The student can then discuss excused class absence and course work with the faculty member who has final authority to excuse students from classes.

## HOUR TESTS

- One or more hour tests are usually given during a semester in each course. These are scheduled by the faculty member within the class periods assigned for the class.
- In a course which has several sections meeting at different hours, a common test for all sections may be given only by arrangement with the Registrar. A schedule of such tests is made up at the beginning of the semester. Requests should be filed as early as possible.
- Attendance at hour tests scheduled outside the normal meeting time of the class shall not have precedence over attendance at other scheduled activities or other important commitments of the students concerned. Faculty members must be prepared to give a make-up test for those unable to be present at the time set.
- University academic responsibilities have priority over other campus events. Attendance at (1) regularly scheduled classes have priority over specially scheduled common hour examinations, (2) common hour examinations have priority over attendance at other activities.

## FINAL EXAMINATIONS

- The examination period at the end of each semester is set by the official University calendar.
- Semester examinations shall be given only during the

regular examination period except by permission of the dean of the college/school on request of the chairperson of the department. No examination shall be given during the last week (the last five instructional days) of the semester except lab exams given in courses with specific lab sections.

- The time and place of each final examination are determined by the Registrar and a schedule is circulated and posted. Any change in the scheduled time or place may be requested by the chairperson of the department concerned when conditions seem to warrant such special arrangement. Decision on such requests rests with the Registrar.
- In every course in which a final examination is given, every student shall take the examination unless excused by the instructor.
- Students having a conflict in their final examination schedule must notify the faculty concerned of such conflict not later than the close of business one week prior to the last day of classes for the semester in which the conflict arises.
- Students who are absent from a final examination for any reason must report that fact and the reason, in person or in writing, to their instructor within 24 hours. If the absence is due to any situation beyond the reasonable control of the student (e.g. illness or family tragedy), the instructor must provide the student with the opportunity to complete the course requirements. At the instructor's discretion, this may be an examination or some other suitable project. The instructor may require evidence in support of the student's reason for absence.
- If the absence is not reported as provided above, or is not excused by the instructor, the examination is regarded as failed.
- No student shall be required to take three or more final examinations in one 24-hour period.
- Unless a mutually agreeable alternative time can be reached by the student and the instructor, the scheduled make-up will occur the next day after the regularly scheduled examination. These considerations are subject to the following constraints: all exams will be given in the final exam period and all conflicts must be resolved before the start of the final exam period.
- Students will select which of the three examinations they wish to take at an alternative time. In cases where the instructors in all three sections feel it is impossible to give the examination at an alternative time, and all conflicts are in the same college or academic unit, the appropriate dean's office, in consultation with the faculty involved, will establish which of the three examinations will be taken as a make-up. If the unresolved conflict involves more than one college, the deans of the units in question will resolve the matter. If agreement cannot be reached by the deans involved, then a person from the Office of the Provost will establish which of the three examinations will be taken as a make-up.
- All final examination materials should be retained for at least one month after the final examination session in case any questions arise concerning grades and to afford students the opportunity to review their graded final examination papers if they wish to do so.

## GRADES

Grades are reported and recorded as letter grades. Averages are calculated from quality point equivalents.

	Points per Semester Hour
A+ Excellent . . . . .	4.00
A Excellent . . . . .	4.00
A- Excellent . . . . .	3.67
B+ Good . . . . .	3.33

B Good	3.00
B- Good	2.67
C+ Fair	2.33
C Fair	2.00
C- Fair	1.67
D+ Poor	1.33
D Poor	1.00
D- Poor	0.67
F Failure	0.00

This system will start with grades received for courses initiated in the fall semester 1983. Grades received prior to the fall 1983 semester with "+" or "-" will receive only those quality points shown on page 42 of the 1982-83 catalogue.

#### Other grades are:

AU Audit. See page 30 for details.

Inc. Incomplete. This grade applies to course work which is not completed due to circumstances beyond the student's control, e.g. illness, as documented by the Student Health Center; personal tragedy; academic, such as breakdown of computer or laboratory equipment, or unanticipated delay in receiving information from sources inside or outside the University. Incompletes can be awarded only with the permission of the student's college/school dean. The incomplete course requirement will be satisfied at the earliest possible date. In no case shall this time be set longer than the beginning of the corresponding semester of the next academic year. In cases of laboratory assignments, the student must complete all work the first time that the laboratory experience is offered again. It will be the responsibility of each dean's office to determine through the Registrar whether any incompletes have been awarded without prior approval. It is the student's responsibility to learn from the dean's office whether the request has been approved, the date of completion, and, from the instructor, the nature of all outstanding requirements.

#### Procedure:

1. Medical. Students contact the appropriate dean's office to determine type of academic relief needed (i.e. incomplete, withdrawal). Students complete a Medical Action Request and submit it to the Student Health Center. Students and faculty will receive confirmation of eligibility for medical action from the dean's office.
2. Personal tragedy. Students contact the appropriate dean's office to discuss these matters. Confirmation of eligibility for incompletes will be provided to faculty by the dean.
3. Academic. Students contact the course instructor to request an incomplete grade. It is the instructor's responsibility to confirm to the dean eligibility for incompletes on academic grounds.

In all cases, the instructor will fill out and forward to the student's academic dean an incomplete card which will describe the reason for the incomplete and will note the completion date to which the student and instructor have agreed.

- XC Extended Course. This grade is awarded at the end of the semester to a student who is enrolled in an identified course, the nature of which makes it unreasonable or impossible for the student to complete the required work within the regular semester.
- NP Not Passed, not used in grade-point average computation.
- P Passed, not used in grade-point average computation.
- W Withdrawn, no evidence upon which to assign WP or WF, not used in grade-point average computation.
- WP Withdrawn, passing, not used in grade-point average computation.

WF Withdrawn, failing. This grade is weighted as an "F" in the computation of the grade-point average.

M Missing. Grade not turned in by the instructor.

In cases in which a student requests reconsideration of a grade for a course already taken, the grade change, if any, must be made by the instructor and approved by the student's dean by the end of the first month of the following semester unless an extension is granted by the student's dean.

## TRANSFER OF CREDIT

Students seeking to transfer academic credit from all institutions, national and international, may do so only for courses which are comparable in content, nature, and intensity to courses taught at the University of Vermont and are graded at the level of C- or higher. Specific questions regarding credit transfer should be directed to the Office of Transfer Affairs, 327 Waterman.

## ACADEMIC REPRIEVE POLICY

An Academic Reprieve Policy for former students returning to complete baccalaureate or associate degree programs became effective at the University of Vermont in the fall semester of 1986. This policy is designed to make it possible for former UVM students, whose academic performance when first enrolled was below standard, to resume their studies without the encumbrance of the grades previously earned.

The Academic Reprieve Policy is available to returning students who have not been enrolled at UVM or any other accredited institution of higher education for a period of at least three calendar years.

Former students returning to the University may request the application of the Academic Reprieve Policy only once in their career at UVM.

The established University procedures and criteria for readmission apply to all students, including those who may be eligible for the application of the Academic Reprieve Policy.

The dean of the college/school in which the student is enrolled at the time of initial eligibility for the application of the Academic Reprieve Policy shall determine all questions as to eligibility for, and application of, the "policy."

A person meeting the criteria for eligibility must file a petition with the appropriate dean requesting reprieve of all prior course work at the University, either at time of readmission or before the close of the first semester of re-enrollment. The Reprieve Policy includes all previous UVM work and does not allow the students to pick and choose individual courses for reprieve. All courses with grades below passing are ignored, credit hours for courses passed are carried forward, but the grade is not figured in the new grade-point average which begins again at zero.

Any person electing the reprieve option is required to complete a minimum of 30 additional regularly graded credits at the University before a degree may be awarded (15 regularly graded credits for the associate degree); these credits are not open to the pass/fail option. Those electing the reprieve option may qualify for honors at graduation only on the same basis as any transfer student, i.e. completion of 60 or more regularly graded credits at UVM (30 or more regularly graded credits for the associate degree programs).

Persons electing the reprieve option will be required to meet degree requirements of the catalogue in effect on the date of the student's application for readmission.

The Reprieve Policy applies solely to regular undergraduate degree programs. Graduate programs are specifically excluded.

## CLASS STANDING

The designation of a student's class shall be determined by the number of credits completed. The divisions are as follows:

	Credit Hours
Bachelor's degree:	
Freshman . . . . .	0-29.9
Sophomore . . . . .	30.0-59.9
Junior . . . . .	60.0-89.9
Senior . . . . .	90.0 and over
Associate degree:	
Freshman . . . . .	0-29.9
Senior . . . . .	30.0 and over

## TRANSCRIPTS

An official transcript is the reproduction of a complete, un-abridged permanent academic record validated with the University seal, facsimile signature of the Registrar, and date of issue. A Key to Transcript is included which contains a full statement of pertinent definitions. A rank-in-class entry is made upon completion of degree requirements.

Currently enrolled as well as former undergraduate and graduate students may obtain an official transcript of their permanent academic record by writing the Office of the Registrar, 360 Waterman Building. Please allow a minimum of one week for normal processing and three weeks following the end of a semester.

Transcripts are not released when there is an indebtedness to the University.

## ACCESS TO RECORDS

Students have the right to review any of their educational records maintained by the University. Students also have the right to have all educational records maintained in a confidential manner. In appropriate situations, students may choose to waive some or all of these protections, but such waivers must be clearly stated in writing. If a student feels an educational record to be misleading, or containing information which is inaccurate, a hearing may be scheduled to seek appropriate modification. Requests for review of records should be made to the Registrar.

## NAME AND ADDRESS EXCLUSION

The Family Educational Rights and Privacy Act of 1974 grants to all University students the right not to have personal information contained in the records of the University released to any individual, agency, or organization. UVM feels that the following categories constitute such personal information.

- Category I Name, address, telephone number, dates of attendance
- Category II Class, previous institution(s) attended, major field of study, awards, honors (including dean's list), degree(s) conferred (including dates)
- Category III Past and present participation in officially recognized sports and activities, physical factors (height, weight)
- Category IV Date and place of birth

Students who do not wish to have one or all of the above categories of information released should fill out an information exclusion card at the Registrar's Office.

## UNIVERSITY HONORS

The Bachelor's and Associate's degrees may be conferred with honors, by vote of the Senate, in recognition of general high standing in scholarship. Three grades are distinguished and in-

dicated by inscribing on the diploma the words *cum laude*, *magna cum laude*, or *summa cum laude*.

Honors are determined in the following manner: Within the graduating class of each college or school, students in the top one percent will receive *summa cum laude*; the following three percent will receive *magna cum laude*; the next six percent will receive *cum laude*. The total number of honors awarded will not exceed ten percent of the graduating class of each school or college.

Honors will be calculated on all grades received at this University. In order to be eligible for consideration, a student must have taken at least 60 hours (30 hours for two-year programs) at this University in which a letter grade of A, B, C, D, or F has been awarded.

## DEAN'S LIST

The deans of the undergraduate colleges/schools publish at the beginning of each semester the names of those full-time students with a grade-point average of not less than 3.0 who stood in the top 20 percent of each class of their college/school during the preceding semester. Full-time enrollment in this case shall be a minimum of 12 credit hours in courses in which grades of A, B, C, D, or F have been given.

## STUDENT LEAVE OF ABSENCE POLICY

A leave of absence means that a student who is eligible for continued enrollment ceases to be enrolled while in good standing and is guaranteed readmission. This policy benefits both the student and the University in that it enables a student to plan for readmission to the University and allows the University, by having records on the expected date of return of its students, to refine further the planning of the size of the student body. The following statements further define a leave of absence:

1. Upon application to the academic dean, a student may be granted a leave of absence by that dean when that application merits the commitment of the University to insure the student's readmission.
2. A leave must be granted for a finite period of time.
3. A leave normally may not exceed four semesters.
4. A leave normally may not be granted for the current semester after the day on which courses can be dropped without penalty.
5. A leave may not be granted to students currently on academic trial or disciplinary probation.
6. A leave is distinct from withdrawing for medical reasons and is not granted for medical reasons.
7. A leave does not guarantee housing upon the student's return.
8. A leave guarantees readmission to the student's college/school in the University if the student confirms intent to return by the closing date for a normal readmission application (October 31 and March 31 preceding the appropriate semester).
9. While on a leave, an individual's student status is temporarily terminated. A leave of absence guarantees an individual's readmission only if the appropriate action is taken.
10. Financial aid awarded but not used prior to a leave will not be carried over. Reapplication for aid for the readmission period must be made according to normal Office of Financial Aid policies and procedures applicable to that period.
11. A leave should be confirmed by the appropriate form signed by both the student and the dean of the college/school involved.





## WITHDRAWAL

Students who wish to withdraw from the University must first notify their academic dean in person or in writing.

## READMISSION

Any degree students who have left the University for one semester or more must write to their dean's office to request readmission. Students must apply for readmission by October 31 or March 31 preceding the appropriate semester of return.

## LOW SCHOLARSHIP

The information below describes the general University regulations for low scholarship standing. The Studies Committee of each college/school may determine additional or supplementary requirements. Students with questions regarding their academic standing should consult with their college/school dean.

### 1. "On Trial":

- a. "On trial" is an intermediate status between good standing and dismissal. Students remain enrolled according to stated academic conditions of their college/school.
- b. A student is placed "on trial" by the dean or the designated committee of the college/school concerned. Special academic conditions may be set in each case. Normally the period of "trial" status is one semester.
- c. The circumstances under which a student is placed "on trial" are as follows:
  - (1) Students who are readmitted to the University after having been dismissed for low scholarship re-enter "on trial."

- (2) Generally students are placed "on trial" if in any semester they have failed half or more of the hours of their enrollment but have been permitted to continue in college/school.

- (3) Students whose records have been consistently below the graduating average or generally unsatisfactory in any semester may be placed "on trial" or continued "on trial" even though they do not come within the provisions of Section (2).

### 2. Separation:

- a. Students are dismissed from the University if they receive grades below passing in one-half or more of the semester hours of their enrollment in any semester unless they are allowed to continue by action of the designated committee.
- b. Students who fail to meet the condition of their trial or whose record has been unsatisfactory and consistently below the graduation average may be dismissed for low scholarship even though they do not come within the provision above.
- c. Students dismissed for low scholarship must address their application for readmission to the college/school taking the action.
- d. Any students dismissed for academic or disciplinary reasons must receive written approval from their previous academic dean (or the Dean of Students for disciplinary cases) before enrolling in any University course.

## INTERCOLLEGE TRANSFERS

A student who is or has been a member of any college/school of this University may transfer to another college/school of the University only with the consent of the deans of the two colleges/schools concerned. In the case of veterans receiving edu-

ational benefits through the Veterans Administration, the change must be brought to the attention of the advisor to veterans in the Center for Career Development where a Change of Program or Place of Training form #22-1995 must be completed and submitted for approval to the Veterans Administration.

## UNDERGRADUATE DEGREE REQUIREMENTS

Degrees are conferred on the recommendation of the colleges/schools and specific requirements will be found in the sections devoted to the respective colleges/schools.

In addition to the course requirements of the curricula, students must also fulfill the general requirements in physical education.

To be eligible for graduation, a student must have attained a cumulative average sufficient to meet the minimum requirements for the college/school in which the student is officially enrolled. Beginning with the class of 1984, the minimum grade-point average for graduation is 2.00. Grades in courses accepted for transfer credit are excluded in computing this average.

Every candidate for a degree is required to have taken 30 of the last 45 semester hours of credit (15 of the last 30 for two-year students) in residence at the University except that those who have completed three years of premedical study in the University are awarded their degrees after successful completion of one year of study in any approved college of medicine. Other exceptions to this rule may be made only upon decision of the dean or the appropriate faculty committee of the college or school in which the student is enrolled. To qualify for a second Bachelor's degree, the candidate must have fulfilled all the requirements for the degree and must have taken a full year of work, usually 30 hours, in addition to that taken to qualify for the first degree.

## PHYSICAL EDUCATION

One year of physical education, normally completed during the freshman or sophomore year, is required of all undergraduate students in four-year programs. The two credits earned in activities classes will be included in the total number of hours required for graduation. Students may opt to take activities classes on a pass/no pass basis. (For further details, see the pass/no pass heading under General Information.) Medical examinations are required of all new students. Those with serious defects may be given restricted work or may be excused by the Director of the Student Health Center. The physical education requirement for students pursuing two-year degree programs shall be one credit of course work earned in activities instruction.

Students 25 years of age or older at time of admission are exempt from physical education requirements.

All transfer students under the age of 25 will be required to fulfill the physical education requirement.

## UNIVERSITY RESPONSIBILITY

Many courses involve instruction in and the use of various types of power equipment, laboratory apparatus, and specialized facilities. The University takes every precaution to provide competent instruction and supervision of such courses. It is expected that students will cooperate by following instructions and exercising precaution. In case an accident does occur resulting in personal injury, the University can assume no responsibility.

## USE OF ENGLISH

Correct English usage is demanded by all departments of the University. Written work of any kind which is unsatisfactory in manuscript form, grammar, punctuation, spelling, or effectiveness of expression may be penalized, regardless of content. Students whose written work falls below the standard of correct usage may be referred to the English Department for additional instruction, even though the freshman course in English has been passed.

Before they may be admitted to the University, foreign students must offer evidence that they are capable of reading and writing English at the college level.

## ACADEMIC DISCIPLINE

The University expects each student to maintain high standards of personal conduct and social responsibility at all times both on and off campus. As responsible citizens, all students are required to observe and to share in the support of University regulations. Any student who fails to uphold these standards is subject to disciplinary action by the University.

The disciplinary authority of the University is vested in the President. In such cases as the President considers proper, this authority may be delegated to the several deans and to appropriate judicial bodies. The continuance of each student at the University, the receipt of academic credits, graduation, and the conferring of any degree or the granting of any certificate are strictly subject to the disciplinary powers of the University. The University is free to cancel a student's registration at any time on any grounds if it considers such action to be for the welfare of the institution.

University policy on the above matters is explained in detail in *The Cat's Tale: A Student's Guide to the University of Vermont*. Each student is held responsible for knowledge and observance of these rules and regulations, including those concerned with academic honesty.

## ACADEMIC HONESTY

The principal objective of the University's policy on academic honesty is to promote an intellectual climate and support the academic integrity of the University of Vermont. Academic dishonesty or an offense against academic honesty includes acts which may subvert or compromise the integrity of the educational process at the University. Such acts are serious offenses which insult the integrity of the entire academic community of the University.

Offenses against academic honesty are any acts which would have the effect of unfairly promoting or enhancing one's academic standing within the entire community of learners which includes, but is not limited to, the faculty and students of the University of Vermont. Academic dishonesty includes knowingly permitting or assisting any person in the commission of an offense of academic dishonesty.

The policy distinguishes between minor and major offenses. Offenses purely technical in nature or in which the instructor does not perceive intent to achieve advantages are deemed minor and are handled by the instructor. Major offenses are those in which intent to achieve academic advantages is perceived.

The following is a summary of the steps involved in adjudicating an alleged major offense against academic honesty at the University of Vermont:

1. A faculty member, student, or other University-related person reports in writing the specifics of an instance of alleged academic dishonesty to the Coordinator in the Office of the Provost.

2. The Coordinator will inform, in writing, the student(s) cited in the letter of initiation that charges will be presented to the University Hearing Panel. The student will meet with the Coordinator to be advised on the nature of the process, and the student's rights and responsibilities.
3. A student who has been accused of an act of academic dishonesty has the right to a formal hearing. The student may waive that right, in writing, and thus admit to the charge(s); in this event, the Coordinator will assign the appropriate sanction(s).
4. In the event a hearing is convened, the Presenter will describe the particulars of the charge to the five-member Hearing Panel consisting of three faculty members and two students. It is the responsibility of the Panel to determine whether there is sufficient and suitable evidence to determine guilt; the decision of the Panel with respect to guilt or innocence is determined by majority vote.
5. If a student is found innocent of the charge(s), he or she may drop the course in question without penalty if he or she wishes to; no record of that course will appear on the student's transcript.
6. If a student is found guilty of the charge(s), the Coordinator will assign the sanction(s) in accordance with the standards contained in Section G. Although the sanction(s) will not appear on the student's transcript, a record will be maintained in the Provost's Office.
7. A student found guilty of committing an act of academic dishonesty may appeal, in writing, within five University business days, to the Provost, but solely on the grounds of procedure or abuse of discretion.

A full statement of the policy is in *The Cat's Tale: A Student's Guide to the University of Vermont*. Each student is responsible for knowing and observing this policy.

## FREEDOM OF EXPRESSION AND DISSENT

*The University of Vermont is a place to learn and to teach. It is not a cloister—it does not live in a vacuum. It is both in the world and of the world. Its mission is to educate people for leadership in society.* (Board of Trustees, May 1969)

As the above quotation suggests, the University functions within the rules governing a larger society. It was created by that society for a special purpose: the facilitation of learning and teaching. It follows that the University's regulations must conform with the law as well as take into account the particular role of educational institutions.

Fundamental to our entire philosophy is our firm belief that rights guaranteed by the First and Fourteenth Amendments to the Constitution of the United States must be protected on the campus as elsewhere and that local, state, and Federal laws must prevail on campus. Becoming a member of the University community in no way abrogates or compromises the rights which the Constitution of the United States guarantees to all persons.

Within the University setting as within society at large, the exercise of one's rights must be tempered by recognition of the rights of others. For example, the exercise of free speech may unreasonably infringe upon the right to learn.

The laws of society and the mission of the University establish the framework within which disagreement, dissent, demonstration, and advocacy may, indeed must, occur. For mankind to progress, the educational process must be dynamic even if fraught with controversy, for change cannot take place until the first question is raised. The discovery of new propositions or new solutions also may be followed by passionate advocacy. Such advocacy must never replace the continued pursuit of the University's essential purpose of learning and teaching.

It is within this context that the University rejects the use of, or the threat of force as a means of resolving differences. Violence

is both unnecessary and inappropriate for those who have access to reasoned discourse and is unacceptable within an institution dedicated to reason. The University officer responsible for implementing the Policy Statement on Freedom of Expression and Dissent, when students are involved, is the Chief Student Affairs Officer. In the event faculty or staff are engaged in disruption, The Chief Student Affairs Officer or that officer's duly authorized representative shall consult with the Provost or appropriate vice presidents before taking action. In all cases, the designated officer shall attempt to resolve the situation through efforts of persuasion. The University must, after efforts at persuasion have failed, resort to the use of any legal remedy deemed necessary. Those engaged in unlawful disruption, consequently, may expect appropriate responses from either University or other law enforcement authorities or both.

A full statement of the policy is in *The Cat's Tale: A Student's Guide to the University of Vermont*. Each student is responsible for knowing and observing this policy.

## UNDERGRADUATE ENROLLMENT FOR GRADUATE CREDIT

UVM senior undergraduates may enroll for graduate credit at UVM under the following circumstances: the course must be available for graduate credit; total enrollment including the graduate course must not exceed 12 credit hours in the semester in which the course is taken; the course must not be computed as part of the Bachelor's degree; permission to seek such graduate credit must be requested of the Graduate Dean in writing by the dean of the undergraduate college or school prior to enrollment. Such graduate credit is limited to six hours and is not available for transfer to another institution as graduate credit. It can be used only at UVM if the course is judged appropriate by the student's advisor for the particular graduate program.

## CREDIT BY EXAMINATION

A degree student who wishes to do so may, under the following conditions, receive credit for a course by taking a special examination and paying the special examination fee charge of \$35 per credit hour. The examination fee must be paid prior to taking the examination.

A request for such an examination must be made in writing at least one month before the date of the examination, and it must be approved by the student's advisor, the chairperson of the department in which the course is given, and the academic dean, in that sequence. The student must neither have audited, previously received a grade or mark, or have attempted a prior special examination in this course at the University of Vermont or at any other institution of higher education. The student may not take a special examination in a course whose content is presupposed by other courses the student has already taken. In cases of uncertainty, the department chairperson shall decide whether it is appropriate for the student to take a special examination for credit in a particular course. Upon passing the special examination, as determined by the examiner and the chairperson of the department in which the course is given, the student receives credit, but not a grade, for the course. Credit by examination forms are available in the Office of the Registrar, 360 Waterman Building.

## COLLEGE-LEVEL EXAMINATION PROGRAM (CLEP)

The University considers credit for most of the five general and 30 specific subject CLEP exams providing the student has not previously attempted a similar course of study at a college level. Scores acceptable for credit are comparable to attaining a level of accomplishment equal to a "B" in a graded course

situation. Individual exams may earn a student three, six, or eight semester hours of credit depending on the nature and scope of the material covered.

Students interested in pursuing the CLEP option may obtain further information from the Office of Transfer Affairs, 330 Waterman.

Credit granted for CLEP Examinations may be applied toward distribution requirements and to the total semester hours specified for a particular degree program when approved by the dean of the college/school in which the student is subsequently a candidate for a degree. Information about CLEP and application forms are available at the Counseling and Testing Center, 146 South Williams Street, and the Office of Transfer Affairs, 327 Waterman Building.

### CREDIT FOR CALCULUS

Credit will be given for Math. 21, or Math. 21 and Math. 22, according to the following guidelines.

May receive credit for Math. 21 provided the student:

1. Has not taken the advanced placement test in mathematics, and
2. The average of the grades received in Math. 22 and Math. 121 is B or better, and
3. Received a B or better in Math. 121.

May receive credit for Math. 21 and Math. 22 provided the student:

1. Has not taken the advanced placement test in mathematics, and
2. Received a B or better in Math. 121.

### CREDIT FOR MILITARY SERVICE

Veterans or current military personnel who have been accepted into a degree program at the University of Vermont may have their *military service record* reviewed for possible transfer credit. Veterans should present form DD 214; active duty personnel should present form DD 295. Students should be sure that military course numbers appear on the documents presented for transfer credit review. Exemption from the University of Vermont's 2.00 semester credit physical education requirement is given for active duty service of more than one year.

Transcripts of courses and examinations sponsored by the United States Armed Forces Institute (USAFI) or the Defense Activity for Non-Traditional Educational Support (DANTES)

should be sent directly from the Contractor Representative to the Office of Transfer Affairs, 360 Waterman Building, University of Vermont, Burlington, VT 05405. Records completed prior to June 30, 1974, are available at no cost from: DANTES Contractor Representative, 2318 South Park Street, Madison, WI 53713. Transcripts of courses and examinations taken after July 1, 1974, are available at a nominal charge from: DANTES Contractor Representative, Educational Testing Service, P.O. Box 2819, Princeton, NJ 08540.

Students should contact the Office of Transfer Affairs for more information.

### TYPES OF ENROLLMENT

**DEGREE STUDENTS** — Students who have presented appropriate credentials for admission and have been accepted as students in a degree program.

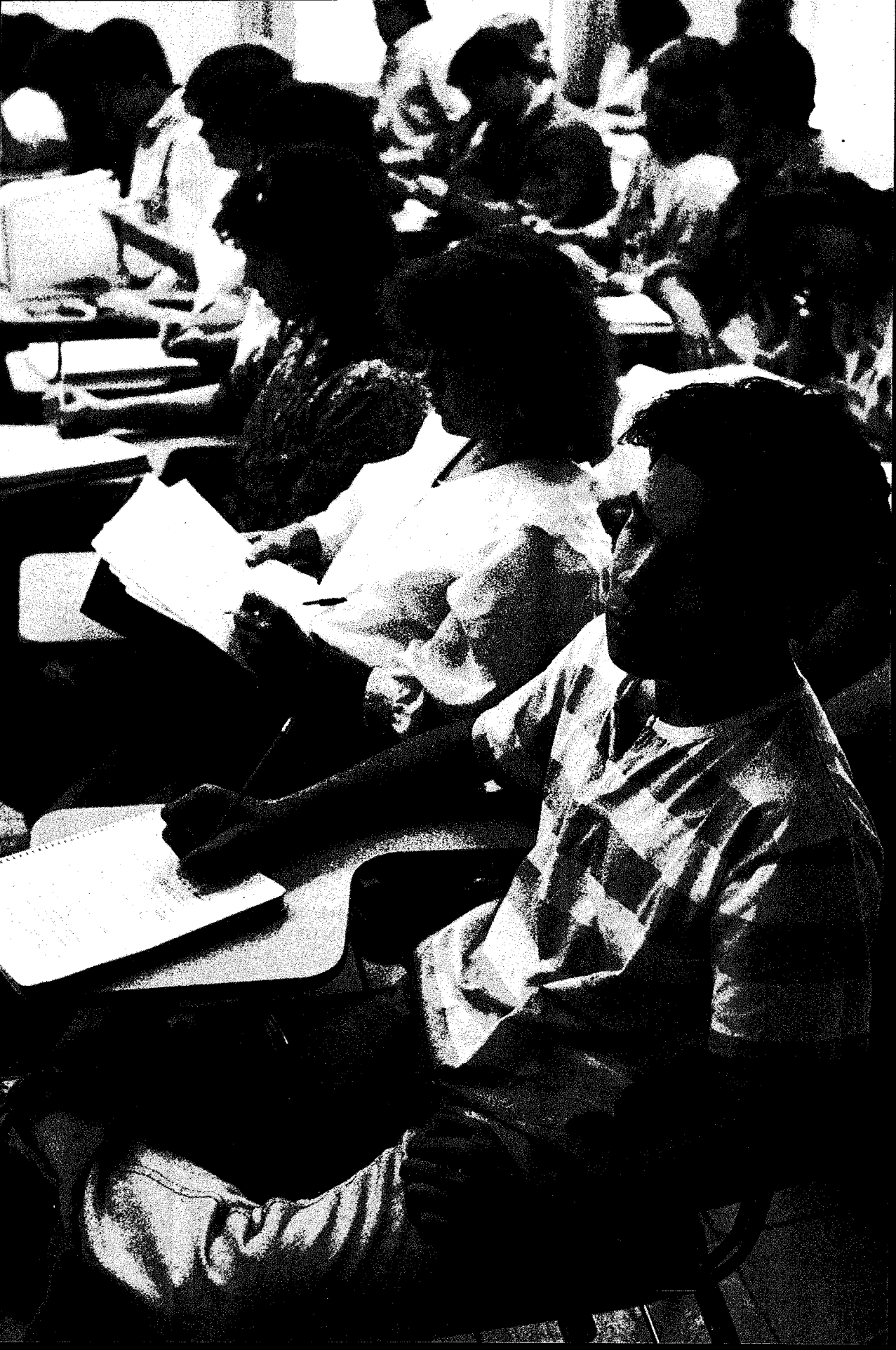
**NONDEGREE STUDENTS** — Students who have presented minimum credentials and are permitted to undertake *limited course work* (up to six credit hours per semester) for a purpose *other than* the earning of a degree through Continuing Education.

*Credits earned by nondegree students who later apply and gain admission to a degree program will be evaluated and, if appropriate, will be accepted toward completion of their degree.* Nondegree students may enroll for a maximum of six credits (or two courses) per semester in the day program. Special permission is necessary for a student to exceed the six-credit maximum. Before completing 30 credits of course work through Continuing Education, degree-bound students should consult with an advisor at Continuing Education, submit an application for formal admission to UVM, and then should consult with the appropriate dean to structure further courses into a degree program.

Selection of courses for those having long-range plans of earning a degree should be made on the basis of information given in this catalogue. Students interested in making a formal application for admission to the University should contact the Admissions Office.

Students presently enrolled and in good standing at another institution may take courses at the University of Vermont to transfer to their institutions. Visiting students are considered nondegree students and should contact Continuing Education for information and registration material.

All nondegree students who would like assistance in planning educational programs and selecting courses should contact Continuing Education, (802) 656-2085.



# Academic Options

In addition to the areas of study detailed in the following sections of the catalogue, a number of curricular options are available which provide unique opportunities for UVM students.

## The Environmental Program

*Environmental Studies* is a special University-wide undergraduate curricular option offering students several exciting academic programs. Directed by the Environmental Program in cooperation with several colleges and professional schools, this option is one of UVM's most distinctive academic programs — unique nationally in its breadth and interdisciplinary nature.

The Environmental Program involves students and faculty from throughout the campus, as well as community professionals, recognizing that study of the environment must draw upon all disciplines and professional fields. The activities of the Program include undergraduate education, research, and community service programs dedicated to the study of the cultural and natural environments essential to the quality of life on earth.

While the Environmental Program attempts to serve a wide range of environmental interests, its primary focus is the individual student. A Director and interdisciplinary faculty work closely with each student in planning an individualized program of studies which combines a broad, comprehensive understanding of the environment together with depth in a specific discipline or profession.

Program offices are located in The Bittersweet, where students are encouraged to visit with the faculty regarding their academic plans, to gain help with research or action projects, and to seek information about academic programs, internships, and future careers.

### DEGREE PROGRAMS

The Bachelor of Science degree in *Environmental Studies* is awarded through the College of Agriculture and Life Sciences, the College of Education and Social Services, and the School of Natural Resources.

The Bachelor of Arts degree in *Environmental Studies* is awarded through the College of Arts and Sciences.

### DEGREE REQUIREMENTS

Students must complete the distribution and credit-hour requirements of their college or school and one of the following programs. Incoming students will be assigned an advisor in the Environmental Program who will assist in selecting a major program, usually during the sophomore year.

### ENVIRONMENTAL STUDIES CURRICULUM

The curriculum in *Environmental Studies* offers students several alternatives leading to an individualized program of studies: The *Major in Environmental Studies* provides a unique academic program for the student seeking an interdisciplinary major leading to the B.S. or B.A. degree, with opportunity for Honors Studies. The *Coordinate Major in Environmental Studies* combines environmental studies with a professional major. The *Minor in Environmental Studies* fulfills the minor requirement for students in the College of Arts and Sciences and is available as an elective minor in other schools and colleges.

Students entering the University may apply for admission to *Environmental Studies* through several of the undergraduate

divisions. Choice of the appropriate college or school will depend on the individual's interests, educational objectives, and selection of one of the program options noted above. It is recommended that prospective students consult with the Environmental Program before making application for admission to the University.

**MAJOR IN ENVIRONMENTAL STUDIES** This interdisciplinary major offers students the opportunity to combine studies in several disciplines and professional fields. In addition to a core of interdisciplinary courses, each student's program includes an individually-designed plan of studies directed toward newly-developing careers and graduate study programs. It is especially suited to the student seeking a broad liberal education with an environmental emphasis.

The Major in Environmental Studies is a highly-selective program for qualified students with well-conceived academic goals. Admission to the major requires submission of an application to the Environmental Program, approval of the Director, and successful completion of *Environmental Studies 151*. In addition to course requirements, this major includes a required senior research thesis, which may qualify for college or school honors recognition.

#### *Environmental Studies Core*

Required Courses:	Credit Hours
Introduction to Environmental Studies (ENVS 1)	4
International Environmental Studies (ENVS 2)	4
Environmental Theory (ENVS 100)	3
Seminar in Environmental Studies (ENVS 204)	3

#### *Environmental Studies Major Program*

Intermediate Environmental Studies (ENVS 151)	3
Research Methods (ENVS 201)	3
Senior Project and Thesis (ENVS 202/203)	6-15
(A research or action project planned and designed in ENVS 201. Credit arranged in consultation with senior thesis advisors)	
Individually-designed program of studies (Credit requirements vary, depending on college or school)*	6-24*
Electives and College or School Requirements	60+
Total Credits	120+*

### COORDINATE MAJOR IN ENVIRONMENTAL STUDIES

For students in several colleges and schools, this program offers the best combination of career opportunities and environmental interests.

In addition to the Environmental Studies Core and an individualized plan of study, students complete requirements for a major in a related discipline or professional field in their school or college.

#### *Environmental Studies Core*

Required Courses:	Credit Hours
Introduction to Environmental Studies (ENVS 1)	4
International Environmental Studies (ENVS 2)	4
Environmental Theory (ENVS 100)	3
Seminar in Environmental Studies (ENVS 204)	3

#### *Coordinate Option*

At least three intermediate or advanced environmentally-related courses selected in consultation with an advisor in the Environmental Program. 9+

#### *Major Program (other than Environmental Studies)\**

Consult other sections of the catalogue for major requirements and actual credit hours, and for core and

distribution requirements. Education students seeking certification in Environmental Studies in elementary or secondary education refer to page 75.

Total Credits

120+\*

**MINOR IN ENVIRONMENTAL STUDIES\*** Students in the College of Arts and Sciences may elect this minor to fulfill the minor requirement in that college. Minor programs are available on an elective basis in most other schools and colleges.

\*Consult appropriate section of catalogue for the exact requirements of each college or school.

## The Home Economics Program

The Home Economics Program is an interdisciplinary program about people which provides a unique option for students searching for a major or for those who have selected a major. A sequence of courses in family issues may be chosen — nutrition, consumer management, and family systems, for example. Combined with courses taken for the major, career possibilities are expanded. Students become attractively different from other graduates which enhances career marketability.

This arrangement is formalized by co-enrollment in the Home Economics Program which means that these courses are taken within the four-year degree requirements. Upon graduation, students are identified as professional home economists. Whether nutritionist, home economics educator, merchandiser, or human service professional, the courses and academic experiences offered through co-enrollment help build a strong foundation for personal and career success.

More can be learned about the Program from the currently co-enrolled students or from the Coordinator. The office of the Coordinator is located on the first floor of Terrill Hall.

## DEGREE PROGRAMS

Co-enrollment is possible with any University major. Students with majors in Nutritional Sciences; Merchandising, Consumer Studies, and Design; Home Economics Education; or Human Development Studies, most often select the co-enrollment option.

## DEGREE REQUIREMENTS

Specific degree requirements are elected by making choices from the co-enrollment selection of courses about family/individual/consumer/client issues and by satisfying departmental requirements. The majors most often selecting co-enrollment are:

Dietetics

Food and Nutrition

(through Nutritional Sciences — see page 53 for details)

Home Economics Teacher Education

(through Vocational Education and Technology — see page 55 for details)

Consumer Studies

Fashion Merchandising

Related Art

(through Merchandising, Consumer Studies, and Design — see page 52 for details)

Early Childhood Development

Human Development and Family Studies

Human Development Education

(through Human Development Studies — see page 78 for details)

Students interested in finding out about these options to broaden their educational background and to enhance their career opportunities are invited to contact the Coordinator of the Program.

## Community Forestry and Horticulture

Community Forestry and Horticulture provides a professional education in the use and care of trees, shrubs, lawn grasses, and other plants in the human environment. Landscape design and contracting, urban forestry, park supervision, and garden center management are some of the professions in this field.

This interdisciplinary program is jointly offered by the School of Natural Resources and the Department of Plant and Soil Science within the College of Agriculture and Life Sciences. A committee of faculty from both units coordinates the program and advises students.

Options in this program are offered by the College of Agriculture and Life Sciences (page 54) and the School of Natural Resources (page 104).

## Reserve Officers' Training Corps

### ARMY

Army ROTC offers programs for men and women leading to a commission as an officer in the United States Army. The University's Department of Military Studies offers courses in world military affairs and related areas. Additionally, special courses offer basic education and technical training in military subjects with emphasis on leadership and management.

The offices of the Department are located at 601 Main Street.

**PROGRAMS** Military Studies at UVM consists of several programs: (1) A four-year program comprised of a Basic Course open to all freshmen and sophomores and an Advanced Course for qualifying juniors and senior. This generally requires one military studies course per term during the four years of undergraduate study. Attendance at the six-week advanced summer camp is required between the junior and senior year. (2) A two-year program for sophomores who have not taken the prerequisite ROTC courses for the advanced program. The program requires a six-week basic summer camp, between the sophomore and junior year; one course per term during the junior and senior year; and attendance at the advanced summer camp. (3) The Simultaneous Membership Program allows students to be active members of local National Guard units or Reserve units drawing approximately \$100 per month pay, in addition to being members of the Advanced Course. (4) The Early Commissioning Program allows students who have fulfilled the military prerequisites for commissioning to receive a Reserve Officer's Commission while still completing their undergraduate studies. (5) The Veterans Program recognizes previous military service and provides commissioning opportunities for enlisted veterans.

**SCHOLARSHIPS** Scholarships, available for four, three, and two years provide tuition, fees, a semester allowance for books and supplies, plus \$100 a month tax free during the school year.

Application for the four-year scholarships is made during the senior year in high school. The three- and two-year scholarship applications are made through the Department of Military Studies.

**SUBSISTENCE ALLOWANCE** All junior and senior cadets receive \$100 a month tax free. Students also receive travel



allowances to and from summer camp, plus approximately \$825 while at camp.

**EXTRACURRICULAR ACTIVITIES** Pershing Rifles offers membership to participating students. Sponsored by the Department of Military Studies, the Pershing Rifles is a military organization fostering a spirit of competition and cooperation among university students.

**POSTGRADUATE** Upon graduation, ROTC students are normally commissioned as officers in the U.S. Army. The active duty service obligation will vary from three months with a Reserve Commission to four years for scholarship commissionees, dependent upon Army needs and personal desires. Active duty may be deferred for as many as four years for those who wish to pursue an advanced degree while studying as a full-time graduate student.

### Typical Curriculum

	1st	2nd
	SEMESTER	
FRESHMAN YEAR	MSTD 1 MSTD 13*	MSTD 2 MSTD 12*
SOPHOMORE YEAR	MSTD 5 MSTD 12*	MSTD 4 MSTD 13*
JUNIOR YEAR	MSTD 201	MSTD 202
SENIOR YEAR	MSTD 203	MSTD 204

\*Optional

## AIR FORCE ROTC AT SAINT MICHAEL'S COLLEGE

The Department of Aerospace Studies, located at Saint Michael's College in Winooski, provides preprofessional preparation for future Air Force officers. Participation is available to all UVM students in all academic majors. The curriculum is designed to develop career-oriented men and women who can apply their education and AFROTC experience to their initial active duty assignments as Air Force Commissioned Officers. In addition to the formal course of study shown on page 111, pilot candidates participate in a 14-hour Flight Screening Program during the summer between their sophomore and junior year.

Students who did not have the opportunity to take the freshman and sophomore ROTC courses or did not elect to do so may contact the Department of Aerospace Studies during the first semester of their sophomore year for details on the two-year program. For more information, call 655-2000, ext. 2554.

**SCHOLARSHIPS** Air Force ROTC College Scholarships provide up to full payment of tuition, laboratory fees, textbooks, and a tax-free payment of \$100 per month while the student is in school and on scholarship status. Applications for the four-year AFROTC College Scholarships must be submitted by fall of the high school senior year. Scholarships for shorter periods are available for qualified freshman and sophomore UVM students.

**SUBSISTENCE PAY** Students in their last two years of AFROTC receive tax-free subsistence pay of \$100 per month.

**UNIFORMS** Uniforms are furnished at no cost.

**AFROTC FIELD TRAINING** is offered during the summer between the sophomore and junior years at selected Air Force bases throughout the U.S. Students in the four-year program participate in four weeks of field training. Students applying for entry into the two-year program must successfully complete six weeks of field training prior to enrollment in AFROTC. Students also receive travel allowances to and from summer camp, plus approximately \$500 while at camp. The major areas of study include junior officer training, aircraft and aircrew orientation, career orientation, survival training, base

functions, Air Force environment, and physical training.

**SUPPLEMENTAL COURSES** All contract cadets must complete certain required supplemental college courses in addition to all Aerospace Studies courses. Contact the Department of Aerospace Studies for details.

## Study Abroad

The Office of International Educational Services, located in Room B161 of the Living/Learning Center, is both an advising and a resource center for students interested in a year, semester, or summer overseas study experience. UVM Study Abroad Advisors maintain extensive information about overseas programs and foreign institutions. They are available to help students identify programs appropriate to their needs and arrange credit approval from UVM. All students intending to study overseas on a non-UVM program and receive transfer credit from UVM are required to visit the Office of International Educational Services and to complete the Study Abroad Approval Form prior to departure. This applies even to students intending to pursue independent study overseas under University of Vermont auspices.

Only those students who complete a Study Abroad Approval Form are sanctioned by the University to study abroad. This official approval is required for students to be guaranteed that their programs of study are eligible for transfer credit upon their return and/or that they will be able to take their financial aid overseas.

To be approved to study abroad, students must:

1. Meet the admissions criteria of a University approved study abroad program. University approved programs include those programs on the UVM recommended study abroad programs list and those approved through a petition process.
2. Have a minimum cumulative GPA of 2.5, or between 2.0 and 2.5 with a minimum GPA of 2.5 for each of the last two semesters prior to studying abroad.

Students with a GPA above 2.0, but who do not qualify under point two above, may petition to their academic dean for permission to study abroad. Students seeking such permission should contact one of the study abroad advisors in the Office of International Educational Services for assistance.

Students who have been dismissed or are on academic trial are generally not eligible to participate in study abroad programs. Such individuals are encouraged to consult with their individual deans' offices regarding the interpretation of this policy.

Under no circumstances will a student on disciplinary suspension the semester before studying abroad receive official UVM approval for overseas study.

*The Study Abroad policy outlined above is pending the approval of the Faculty Senate on May 9, 1988.*

In addition to the opportunities for students to participate in many non-UVM overseas study programs all over the world, the University has direct involvement in and/or is a sponsor of the following programs:

**The Vermont Overseas Study Program (VOSP)** is a program of studies at the University of Nice, France, administered by the College of Arts and Sciences at the University of Vermont. The program runs for the full academic year and is designed to provide an opportunity for students of widely varied interests and majors to improve and perfect their French and knowledge of France, as well as to pursue a course of study in the fields of their interest at a French university.

Since all instruction is carried out in French by professors of the University of Nice, a good working knowledge of the French language is essential. Students should have completed

at least nine hours of intermediate French on the university level by the end of the year of application. VOSP participants at the University of Nice earn 30 to 33 credits for the academic year. For further information, contact Kate Perry, Program Coordinator, Department of Romance Languages, 513 Waterman Building.

**Semester Program in Grenoble, France, in International Marketing:** This program is sponsored by the six New England land-grant universities. It provides an opportunity for students interested in international business, economics, and trade to participate in an English-speaking program while gaining exposure to France's history, language, and culture. For more information, contact Prof. William Cats-Baril, 339 Votey Hall.

**Junior-Year-in-Salzburg Program:** Administered by the University of Maine, this academic year program at the University of Salzburg in Salzburg, Austria, is open to qualified University of Vermont undergraduates in all major fields. Basic requirements are: completion of sophomore year; two years of college-level German with an average of B; and good academic standing (a cumulative average of 2.5). For information, contact Prof. Veronica Richel, Department of German and Russian.

**College Year in Scandinavia:** Scandinavian Seminar runs this one-year total cultural immersion program in Denmark, Finland, Norway, and Sweden. There is no language prerequisite. Following orientation in Denmark and intensive language programs, students are placed individually at a Scandinavian folk school according to their academic and extracurricular interests. Areas of studies include environmental studies, art, women's studies, international relations, and European area studies. For information, contact the Office of International Educational Services.

**Institute of European Studies:** This nonprofit organization sponsors programs in Madrid, Spain; Mexico City, Mexico; Vienna, Austria; Freiburg, Germany; Paris and Nantes, France; London and Durham, England; Nagoya, Japan; and Singapore. Semester, year, and summer options are available. For information, contact the Office of International Educational Services.

The University of Vermont is also a participating institution in the following programs:

**American Collegiate Consortium for East-West Cultural and Academic Exchange:** This consortium sponsors exchanges between students from its member institutions in the U.S. with students enrolled in participating institutions of higher education in the Soviet Union. Students must have a minimum of three years of Russian to qualify. For information, contact the Department of German and Russian or the Office of International Educational Services.

**American Institute for Foreign Study (AIFS):** A publicly owned company, AIFS, Inc., is a nationwide organization which provides comprehensive overseas study and travel programs in Europe, Africa, and Asia. For information, contact the Office of International Educational Services.

**Kansai Gaidai:** Students interested in Japanese language and culture may spend a semester or year studying at this university near Kyoto, Japan. UVM participants will pay tuition, fees, room, and board charged at their home institution and change places with students from Japan. For information, contact Prof. Allan Andrews, Department of Religion, or the Office of International Educational Services.

**Intercollegiate Center for Classical Studies in Rome:** Properly qualified students may attend one or two semesters at

the Center and receive full credit. For information, contact the chairperson of the Department of Classics.

**International Student Exchange Program (ISEP):** This program facilitates the exchange of students between academic institutions throughout the world on a one-for-one basis for a single academic year. UVM participants pay the tuition, fees, room, and board charged at their home institution and exchange places with students from Europe, Asia, Australia, Canada, Africa, and Latin America who have similarly covered the cost of their tuition, fees, room, and board. For information, contact the Office of International Educational Services.

**Quebec Universities Exchange Program:** UVM is a member of a New England consortium of higher education institutions which sends students to Quebec for a year or semester of university study. Students pay their UVM tuition and fees and exchange places with university students from Quebec. For information, contact the Office of International Educational Services.

**The Swedish Program:** Sponsored by the University of Stockholm and by a consortium of participating American colleges and universities (of which UVM is a member), this nonprofit program focuses upon organizations and public policy in every social science discipline. Its curriculum is thematically specific, interdisciplinary, and relevant to the host country (Sweden). For information, contact the Office of International Educational Services.

## The Living/Learning Center

The goal of the Living/Learning Center is to integrate academic and cultural activities with residential living in ways that enrich the personal and intellectual lives of its participants. It is an academic and student support unit as well as a residence, housing 588 students and several faculty families, as well as faculty and administrative offices, including the Center for Career Development and the Learning Cooperative.

The focus of the Living/Learning Center is the group of 20 to 30 programs, each of which is a year-long plan of course work, independent study, seminars, field trips, or other special activities which support a specific program theme. Programs are designed and directed by students or faculty members and reflect academic interests of the program leaders and participants. Program organization includes statements of the skills, knowledge, or creative talents the program seeks to develop in its members. Living/Learning Center programs thus supplement the University's commitment to excellence and innovation in curriculum and instruction. The Center provides a novel environment in which each of the schools and colleges of the University is able to offer particular curricular elements in an atmosphere which fosters broad opportunities for intellectual discourse.

The freshman, sophomore, junior, senior, and graduate students who reside in the Center live with fellow program members in five-, six-, or seven-person suites adjoining a common living room and bathroom facilities. This fosters close friendships and communication among the program members. The suites are located in each of the five buildings as are classrooms, laundry rooms, common living rooms and kitchens, as well as apartments for resident faculty and their families. The Center has a reading room/reference library, computer terminal room, several classrooms, grocery store, music practice rooms, dining hall, a preschool, an audio/visual room, U.S. post office, a main Center lounge with a fireplace, and an art gallery. In addition, through the efforts and expertise of accomplished staff artists, the Center has pottery and photography studios that provide direct program support for the L/LC community. The University community is invited to become "coop" members of the pottery and photography studios, pro-

viding members with informal instruction and use of the facilities and equipment. The building is accessible and equipped for the handicapped.

Every program, faculty and student directed, sponsors educational activities to which the entire UVM community is invited, making Living/Learning a center of cultural and intellectual activity. An evening's activities might include a sign language workshop, conversational Russian, dialogue with UVM faculty, artistic performances and gallery exhibits, or presentation by the mime program.

Attracting townspeople through the exciting opportunities for involvement and learning, the Living/Learning Center and its residents benefit from the expert advice of interested Burlingtonians who participate as L/LC Student Program Advisors, workshop leaders, local audiences (theatrical and musical performances), L/LC art gallery devotees, and as guest artists who exhibit or perform their art for the L/LC students and University community.

The Living/Learning Center offers the opportunity to be part of a community of people — students, faculty, and administrative staff — who share the goal, work, and excitement of together improving the scope and quality of their University experience.

## Continuing Education

Through evening, summer, and noncredit programs, the University provides learning opportunities to persons who have or have not previously attended college, who desire additional knowledge for their careers, or who wish to pursue previously unexplored areas of study. Continuing Education is a primary advocate and resource for all nondegree students involved in learning opportunities at the University and is responsible for the resolution of nondegree student academic or administrative concerns.

### EVENING DIVISION

The University's Evening Division offers undergraduate and graduate courses each semester between the hours of 4 and 10 p.m. and on weekends. The courses are instructed by UVM faculty on the Burlington campus and in communities throughout the state.

### SUMMER SESSION

Beginning in May and continuing to mid-August, Summer Session courses of varying length allow maximum flexibility for a variety of students. Summer Session is an integral part of the total academic program with special consideration given to students accelerating a degree program as well as the professional

education needs of teachers and school administrators, engineers, managers, and human services professionals.

*Note:* Regularly enrolled undergraduate students should verify with their advisor and dean that any evening or summer course would be appropriate to the degree for which they are working. Students not officially admitted to the Graduate College who wish to enroll for more than six graduate credits in one semester must receive permission from the Graduate Dean.

## COMMUNITY EDUCATION PROGRAM

The University's community education program, focused through the Church Street Center in downtown Burlington, offers a diversity of noncredit minicourses and workshops, career-oriented certificate programs, special activities, films, and exhibits.

## MANAGEMENT DEVELOPMENT SERIES

These one- and two-day intensive, public or custom-designed in-company seminars offer management techniques and new technologies to provide professional development opportunities for individuals who work at all levels in both public and private organizations.

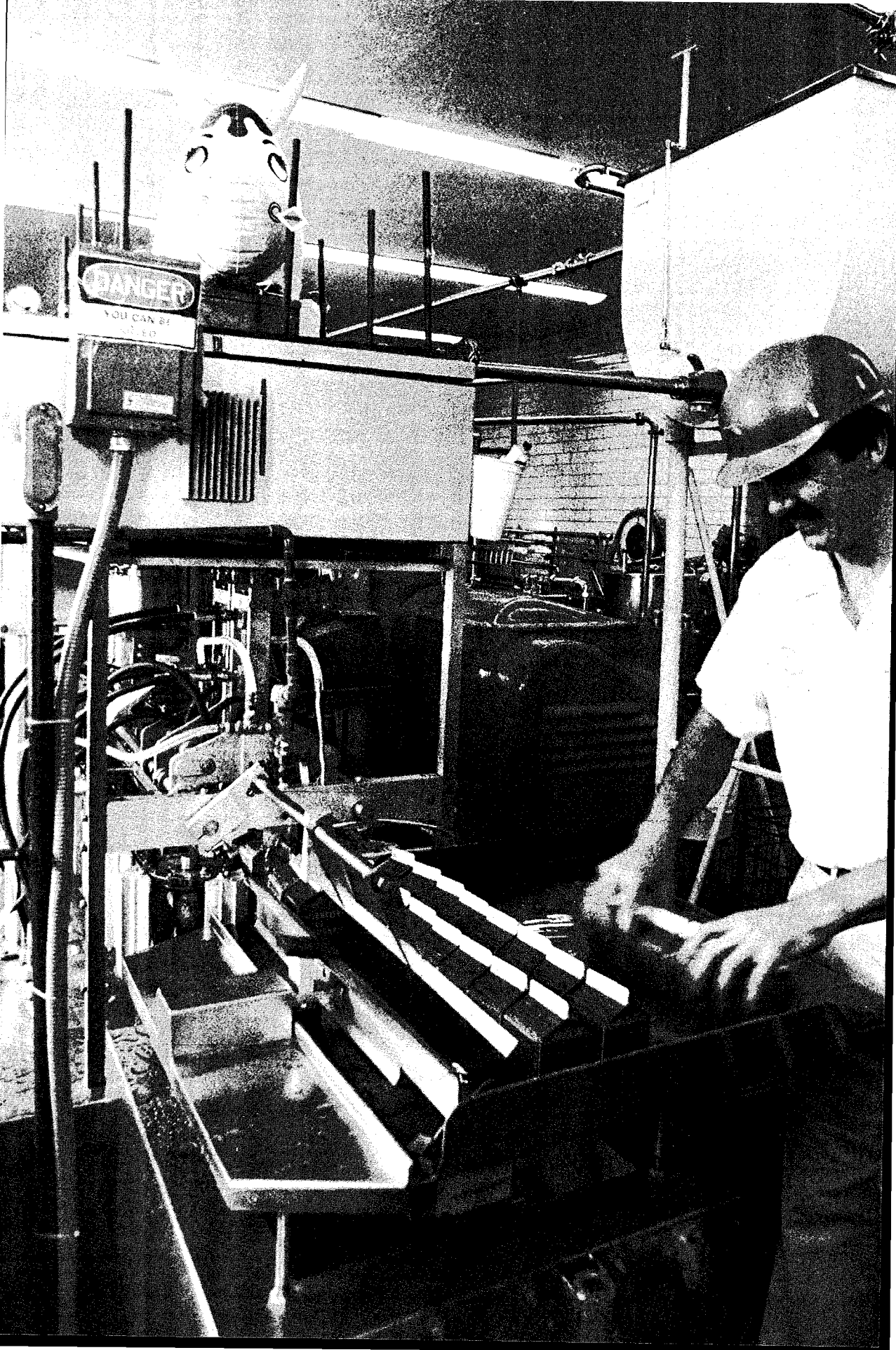
## CONFERENCE PLANNING SERVICES

Conference planning services, through Continuing Education, provides coordination, facilities, and support of professional meetings, seminars, and conferences of local, regional, and national organizations.

## INFORMATION AND ADVISING

Seasonal catalogues and detailed information describing all of Continuing Education's courses and programs are available through any of its offices: Director's Office/Evening Division/Summer Session: 322 South Prospect Street, Burlington, VT 05405 (802) 656-2085; Noncredit Programs/Management Development Series/Conference Planning Services: 460 South Prospect Street, Burlington, VT 05405 (802) 656-2088; Church Street Center: 135 Church Street, Burlington, VT 05405 (802) 863-0202; Southern Vermont Continuing Education Center: 411 Western Avenue, West Brattleboro, VT 05301 (802) 257-7967.

An advisor is available for Continuing Education students to discuss educational plans, give information on current courses and workshops, help resolve an administrative problem, or answer questions about University policies. Call 656-4220 for an appointment.



# The College of Agriculture and Life Sciences

The College of Agriculture and Life Sciences performs four public functions: teaching, conducting research, disseminating information to the public, and performing related services. These four areas of work are performed by the resident instruction division, the research division (Agricultural Experiment Station), the extension division (University of Vermont Extension Service), and the Related Services Division.

The curricula of the instructional division prepare students for professional careers in business, management, specialized services, sales, education, government service, and research.

The evolution of society is characterized by continual progress and change. The challenge of preparing students to excel now, yet adjust to future changes, is met through programs which give a foundation in the social sciences and the humanities as well as providing a fundamental technical education.

Certain courses are prescribed in each area of study with an allowance made for the election of additional courses, providing a well-balanced and integrated educational program and insuring reasonable concentration. Faculty advisors counsel students in selecting elective courses and solving educational problems. The normal semester program includes 15 to 18 credit hours of courses.

The College of Agriculture and Life Sciences welcomes applications from international students. The specific procedures and requirements are listed on page 11. Students who need to increase their proficiency in English can apply to Saint Michael's College in Winooski for admission to their English As a Second Language Programs. Students enrolled in Saint Michael's College have access to advising from faculty in the College of Agriculture and Life Sciences.

The offices of the Dean of the College are located in Morrill Hall.

## ORGANIZATION

The College's resident instruction division consists of nine departments: Agricultural Biochemistry; Agricultural and Resource Economics; Animal Sciences; Botany; Nutritional Sciences; Merchandising, Consumer Studies, and Design; Microbiology; Plant and Soil Science; and Vocational Education and Technology; and one interdepartmental program in Biological Sciences.

## DEGREE PROGRAMS

The Bachelor of Science degree is awarded for the programs listed below:

Agricultural Economics — concentration in:

- Small Business Management
- Food Marketing and Agribusiness
- Farm Business Management
- International Agriculture
- Rural Economy

Agricultural and Energy Technology

Animal Sciences — concentration in:

- Animal Agribusiness
- Dairy Production
- General
- Preprofessional Science

Biochemical Science

Biological Science

Botany

Community Forestry and Horticulture

Consumer Studies

Dairy Foods — concentration in:

- Dairy Processing and Quality Management
- Dairy Production and Foods
- General
- Preprofessional Science

Dietetics

Environmental Studies

Fashion Merchandising

Home Economics Education

Microbiology

Nutritional Sciences

Occupational and Extension Education — concentration in:

- Agriculture and Natural Resources Education
- Extension Education
- Industrial Education

Plant and Soil Science — concentration in:

- Agronomy
- Alternative Agriculture
- Horticulture
- Pest Management
- Soils

Related Art (Apparel and Textile Design)

Self-Designed Major

Undecided

## DEGREE REQUIREMENTS

All programs in the College of Agriculture and Life Sciences leading to the Bachelor of Science degree require:

- A. The successful completion of a minimum of 120 credit hours of course work plus two credit hours in physical education.
- B. A minimum cumulative grade-point average of 2.00.
- C. Completion of the following:

	Hours
1. Communication skills	6
a. One course in writing	
b. One course in oral communication	
2. Analytical skills	6
a. One course in mathematics or statistics (Math. 9 or equivalent)	
b. One course in computers (Computer Science 3 or Vocational Education and Technology 85) or demonstrated equivalent computer skills	
3. Biological and physical sciences	6-8
Two courses	
4. Social sciences	6
Two courses	
5. Humanities and Fine Arts	6
Two courses	

D. College of Agriculture and Life Sciences "Beginnings" course. Required of all first semester freshmen.

E. Courses as specified in individual programs.

*The applicability of courses to specific areas is based on content and not departmental label. Courses taught in the College of Agriculture and Life Sciences can be used to fulfill requirements under "C" above; however, they must be taken outside the department in which the student's program of study is located. Applicability of courses to fulfill requirements rests with the student's advisor and, if necessary, concurrence of the Dean of the College.*

Students desiring to complete teacher education programs and teacher certification must apply for admission to Teacher Certification through the Vocational Education and Technology Department prior to their junior year and enroll in appropriate courses in the College of Education and Social Services (see College of Education and Social Services).

Students in the College of Agriculture and Life Sciences may not take more than 25 percent of their course credits in the School of Business Administration.

## COLLEGE HONORS PROGRAM

The College Honors Committee promotes and encourages independent study by recognizing those students who especially excel in their creative, innovative, responsible, and independent pursuit of study.

Independent study can be an important aspect of a student's education. Undergraduate research, independent projects, and internships or field practicums are examples of independent study which have benefited students as they pursued graduate study or sought employment. Over the years a number of undergraduate research projects have been published in well known scientific journals; and manuals, videotapes, and other products of special projects have been incorporated into classes and enhanced the learning environment in the College of Agriculture and Life Sciences.

The completed study, in a form appropriate to the area of study, is evaluated first by a Departmental Review Committee. The best project reports in each department which are judged worth of honors consideration are forwarded to the Honors Committee with the department's written evaluation.

Independent Studies of the highest quality will be chosen for College Honors by the Honors Committee. The student is recognized at College Honors Day and the award is added to the student's transcript.

## PREPROFESSIONAL PREPARATION

Students striving for admission to professional colleges, such as dentistry, medicine, and veterinary medicine, can meet the undergraduate requirements for these programs through enrollment in the College of Agriculture and Life Sciences. Upon admission to the College, each student will be assigned an upperclass peer advisor and a faculty advisor knowledgeable in preprofessional preparation. Competition for admission to professional schools is very keen, and a superior academic record throughout an undergraduate program is necessary to receive consideration for admission. Due to the intense competition, only a small percentage of those freshmen declaring an interest in professional schools actually enter one after completion of the baccalaureate. Consequently, students must select a major, in an area of their choice, to prepare them for a career other than medical sciences. The preprofessional requirements will be met concurrently with the major requirements for the B.S. degree. Students interested in human medical sciences often enroll in either biochemical science, biological science, nutritional sciences, or microbiology. Those interested in veterinary medicine usually enroll in animal sciences, biological sciences, or microbiology.

Each student prepares a four-year program of courses, with the guidance of their faculty advisor, to meet requirements for a B.S. degree in their major. It is recommended that students complete the following courses to meet *minimum* requirements of most professional schools. It is the responsibility of *each student* to contact the professional schools of their choice to determine the exact entrance requirements of those schools.

### Human Medical and Dental Schools:

Biology with laboratory	Biology 1,2
Chemistry with laboratory: inorganic	Chemistry 1,2
organic	Chemistry 141,142

Physics: with laboratory	Physics 11/21, 12/31 or
with calculus	Physics 31/21, 42/31
Mathematics	Math. 19,20
Humanities, Social Sciences, Languages	
Students must complete the minimum College requirements in this area which includes English composition and speech. Additional courses in this area are encouraged if time allows.	

Veterinary Medical Schools: All of the courses listed above under Human Medical Schools plus:

Biochemistry	Ag. Biochemistry 201/210
Economics (some schools)	Economics 11
Written English	English 50 or 53
Genetics	Botany 132 or Biology 101
Microbiology 55	
Nutrition	Animal Sciences/Nutritional Sciences 43

Several schools require a course in introductory animal sciences, feeds and feeding, and livestock production.

Finally, both human and animal medical schools want to see a history of interest in medicine. It is important for students to work with physicians or veterinarians and gain first-hand knowledge of their chosen profession. Volunteer or paid work in hospitals, nursing homes, or emergency centers is important. Commercial farm experience is valuable for preveterinary students also.

Students applying to the College of Agriculture and Life Sciences who express an interest in medicine or preveterinary medicine should present evidence of high performance in high school level science and mathematics courses, plus additional supporting documentation such as high SAT scores, strong letters of recommendation, and a motivational summary statement.

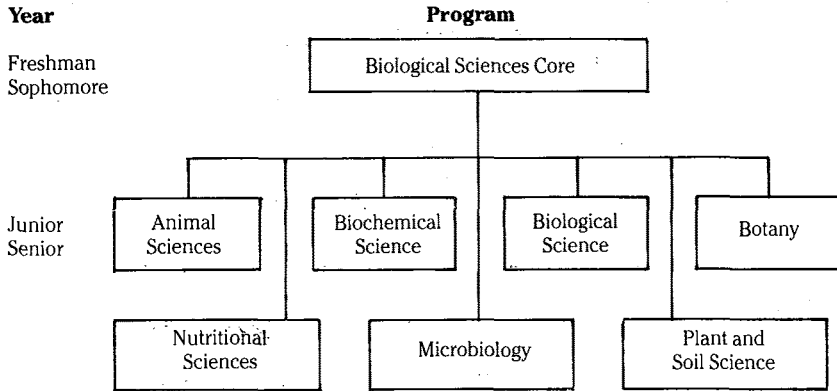
## BIOLOGICAL SCIENCES CORE

Students who have strong academic ability in the sciences and are excited about the future, concerned with contemporary issues, and want a challenging, dynamic career should consider the Biological Science major. This program is designed to provide flexibility in developing a strong background in the biosciences. Students can take advantage of the entire University course offerings by selecting basic and applied biology courses from departments within the College (Agricultural Biochemistry, Animal Sciences, Botany, Nutritional Sciences, Microbiology, and Plant and Soil Science) and across the campus (Anatomy and Neurobiology, Forestry, Natural Resources, Pathology, Pharmacology, Physiology and Biophysics, Wildlife and Fisheries Biology, and Zoology). Selection of courses is not limited by academic regulations or tradition.

The Biological Science program is interdisciplinary and draws on the expertise of faculty from many different departments within the College of Agriculture and Life Sciences. Each student is assigned a faculty advisor from the committee who helps the student select courses. The core program is rigorous and designed to provide students with a broad exposure to different aspects of biology in the freshman and sophomore years. Then students have the opportunity to focus in the area of their choice. This may mean changing majors to one of the traditional departments, or continuing in Biological Science to graduation.

In addition to the general College requirements listed previously, the Biological Science core requires satisfactory completion of: Biology 1,2; Math. 19,20 or Math. 21; Chemistry 3,42 or Chemistry 1,2 and 141,142; Botany 132 or Biology 101 (genetics); Animal Sciences/Nutritional Sciences 43 (nutrition). Course descriptions are presented under the appropriate departments.

Programs in the College, available upon completion of the core curriculum, are shown below. Students should select courses



from these programs during the first two years to gain exposure to different aspects of biology. Students will be advised by a peer advisor and a faculty academic advisor.

**MAJORS: DEPARTMENTAL REQUIREMENTS**

**AGRICULTURAL AND RESOURCE ECONOMICS**

The Department of Agricultural and Resource Economics offers two major programs of study: Agricultural Economics in the College of Agriculture and Life Sciences and Resource Economics in the School of Natural Resources.

**AGRICULTURAL ECONOMICS** Options in the agricultural economics program provide students with basic work in small business and agricultural economics, together with an exposure to courses in the liberal arts and the sciences. Students in this program acquire quantitative skills and analytical concepts that can be applied to a broad range of farm and business problems. Students elect one of five options:

**Small Business Management:** Prepares students for establishing and operating a small, family, or rural business, or to work with organizations serving small businesses.

**Farm Business Management:** Prepares the student to manage a farm business or to work in the many service or educational fields related to agricultural production and finance. Programs available in dairy, forage and field crops, and horticulture management.

**Food Marketing and Agribusiness:** Prepares the student for managerial, sales, or market analysis positions with businesses, especially those that supply agricultural inputs or market agricultural products. Students might also work in government statistical or market analysis programs.

**International Agriculture:** An option for students who are interested in a course of study that will prepare them to work in agricultural development in third world countries, or to work for agencies or private companies with international programs.

**The Rural Economy:** A multidisciplinary study of rural economics in general and the Vermont rural economy in particular. A holistic approach to the economic, political, social, and physical environment.

I. General Education Requirements for All Options:

A. Communication Skills.

- English 1                      Written Expression
- Speech 11                      Effective Speaking

B. Quantitative Skills.

- Math. 19                      Fundamentals of Calculus I or equivalent
- Statistics 111 or              Elements of Statistics
- Statistics 141 or              Basic Statistical Methods
- Economics 100              Statistical Methods for Economists
- Vocational Education      Microcomputer Applications in Agriculture and Life Sciences
- and Technology 85

C. Science.

Two courses in physical or biological sciences.

D. Arts and Humanities.

- Philosophy 1                Introduction to the Problems of Philosophy
- or                              Introduction to Logic
- Philosophy 13
- One unspecified course

E. Social Science.

- Political Science 21        American Political System
- One other course in social science

F. Physical Education.

Two semesters

G. College of Agriculture and Life Sciences Orientation.

- Agriculture 99              Beginnings

II. Option Requirements:

A. **Small Business Management**

Economics:

- 11, 12, Principles of Economics
- 101, Macroeconomic Theory
- 111, Money and Banking

Agricultural and Resource Economics:

- 166, Small Business Management
- 167, Small Business Finance
- 168, Small Business Marketing
- 210, Marketing Institutions
- 254, Advanced Agricultural Economics
- 264, Price Analysis and Forecasting
- 266, Small Business Decision Making
- 267, Small Business Planning Practicum

Business Administration:

- 17 or 18, Business Law

A minimum of an additional 15 hours from a list of restricted electives.



**B. Farm Business Management**

## 1. Dairy

Agricultural and Resource Economics:  
61, Principles of Agricultural and Resource Economics

- 166, Small Business Management
- 167, Small Business Finance
- 201, Farm Business Management
- 207, Markets, Food, and Consumers
- 208, Agricultural and Food Policy
- 254, Advanced Agricultural Economics

Animal Sciences:

- 2, Introduction to Dairy Production
- 43, Fundamentals of Nutrition I, II
- 110, Principles of Animal Feeding
- 213, 214, Dairy Herd Management

Plant and Soil Science:

- 11, Principles of Plant Science
- 141, Forage Crops
- 144, Field Crops
- 161, Introductory Soil Science

Vocational Education and Technology:

- 145, Machinery Management

Farm Management Practicum

## 2. Forage and Field Crops

Agricultural and Resource Economics:  
61, Principles of Agricultural and Resource Economics

- 166, Small Business Management
- 167, Small Business Finance
- 201, Farm Business Management
- 207, Markets, Food, and Consumers
- 208, Agricultural and Food Policy
- 254, Advanced Agricultural Economics

Plant and Soil Science:

- 11, Principles of Plant Science
- 106, Insect Pest Management
- 141, Forage Crops
- 144, Field Crops
- 161, Introductory Soil Science
- 162, Soil Fertility and Management
- 210, Soil Erosion and Conservation
- 215, Weed/Crop Ecology
- 217, Pasture Production and Management
- 261, Soil Classification and Land Use

Vocational Education and Technology (select one):

- 121, Drainage and Irrigation Systems
- 145, Machinery Management

Farm Management Practicum

## 3. Horticulture

Agricultural and Resource Economics:  
61, Principles of Agricultural and Resource Economics

- 166, Small Business Management
- 167, Small Business Finance
- 168, Small Business Marketing
- 201, Farm Business Management
- 207, Markets, Food, and Consumers
- 208, Agricultural and Food Policy
- 254, Advanced Agricultural Economics

Plant and Soil Science:

- 11, Principles of Plant Science
- 106, Insect Pest Management
- 161, Introductory Soil Science
- 162, Soil Fertility and Management

Vocational Education and Technology (select one):

- 121, Drainage and Irrigation Systems
- 145, Machinery Management

Farm Management Practicum

A minimum of an additional 12 hours from a list of restricted electives.

**C. Food Marketing and Agribusiness**

Economics:

- 11, 12, Principles of Economics
- 101, Macroeconomic Theory

Agricultural and Resource Economics:

- 166, Small Business Management
- 167, Small Business Finance
- 168, Small Business Marketing
- 207, Markets, Food, and Consumers
- 208, Agricultural and Food Policy
- 210, Marketing Institutions
- 254, Advanced Agricultural Economics
- 264, Price Analysis and Forecasting

Business Administration:

- 17 or 18, Business Law

A minimum of an additional 15 hours from a list of restricted electives.

**D. International Agriculture**

Economics:

- 11, 12, Principles of Economics
- 101, Macroeconomic Theory
- 102, Microeconomic Theory, or  
Agricultural and Resource Economics 254,  
Advanced Agricultural Economics

- 150, International Trade and Finance
- 185, Comparative Economic Systems

Agricultural and Resource Economics:

- 2, World Food, Population, and Development
- 171, Agriculture in Economic Development
- 201, Farm Business Management
- 207, Markets, Food, and Consumers
- 272, Seminar on World Food Problems and Policies

Each student will elect to concentrate on a particular geographic region of the world (i.e. Africa, Latin America, Southeast Asia, Canada, U.S.S.R., or other). The student will be required to demonstrate competency in the language of the area (reading, writing, and speaking skills through the intermediate level) and to complete at least four courses dealing with the selected geographic region and its people (geography, history, sociology, anthropology, etc.).

**E. The Rural Economy**

Economics:

- 11, 12, Principles of Economics
- 101, Macroeconomic Theory

Geography:

- 3, Introduction to Economic Geography
- 17, Introduction to Urban and Regional Planning

Political Science:

- 161, The Vermont Political System
- 232, Public Policy Analysis, or  
233, Issues of Public Policy

Agricultural and Resource Economics:

- 121, Resource Economics
- 162, Land Economics Issues
- 191, 192, Practicum
- 205, Rural Communities in Modern Society
- 218, Community Organization and Development
- 222, Natural Resource Evaluation
- 233, Rural Planning

**RESOURCE ECONOMICS** For a description of the program in Resource Economics, refer to the School of Natural Resources.

**ANIMAL SCIENCES**

The Department of Animal Sciences offers two academic programs, one in Animal Sciences and the other in Dairy Foods. Each program has specialized options. Experienced faculty ad-

visors work with each student to plan a curriculum that will be appropriate for the individual's career goals. Courses will be selected from a current UVM catalogue. A student must successfully pass a minimum of eight courses in the Department of Animal Sciences, including at least four of advanced standing and senior seminar.

In the junior/senior years, students who have maintained a good academic record are encouraged to participate in one of the many special problem/research courses. These provide an opportunity to work in basic science research laboratories of the Agricultural Experiment Station or to develop applied skills under the direction of a faculty member. Students should investigate a *summer at the W. H. Miner Agricultural Research Institute* or work experience through the Cooperative Education Program in the College of Agriculture and Life Sciences. Opportunities abound for the unusual, exciting educational experience.

**ANIMAL SCIENCES** This program deals with a wide range of options from basic science to farm management. Although programs are highly individualized depending on the students' needs, there are four options offered in this major program:

**Preprofessional Science:** This is the option for students interested in the basic sciences. Students interested in veterinary or human medicine, graduate school in nutrition and physiology, academic positions, or research and development in industry can all start here. Students will be provided with a strong basic science background necessary for advanced study in addition to applied animal agriculture. Opportunities exist for study in a modern laboratory as part of a research team.

**Dairy Production:** The major production option relates to the feeding, breeding, and management of dairy cattle. Supporting courses are also offered in the production of livestock, pleasure horses, and poultry. This option includes practical work experience opportunities in addition to formal classes in science and business. The graduate is prepared to own or manage a modern dairy farm as well as work in allied industry positions.

**Horse Production:** The Department offers five courses in care and management of horses, including courses at Miner Institute (Chazy, NY). In addition, the support courses in nutrition, physiology, animal health and disease, genetics, and management relate equally to horses. Students may wish to take more specialized courses at the University of New Hampshire on an exchange program (New England Student Exchange).

**Animal Agribusiness:** An option that emphasizes business and prepares graduates for supervisory and management positions in industry related to animal sciences. Exciting educational experiences exist through the Cooperative Education Program. Career opportunities exist in the processing and sales of dairy, meat, and poultry products; feed and fertilizer companies; sales of pharmaceuticals; farm equipment and supply agencies; banking, advertising, and public relations. Students will be urged to seek a double major in Agricultural and Resource Economics, since a heavy concentration of courses in that program will be required.

**General Studies in Animal Sciences:** An opportunity to individualize a program or a place to start for students interested in Animal Sciences but with no specific career goals at this time. Some students desire double majors in diverse areas which limits the time available in both. This flexible option provides the mechanism for such a program. Other students simply need a "place to start" and later transfer to one of our other options.

The core courses which all Animal Sciences majors must take are: Agricultural Orientation, Chemistry, Introductory Animal Science, Fundamentals of Nutrition, Biology, Genetics, Phys-

iology, Statistics, Computer Science, Mathematics, and Senior Seminar. Each student must select elective courses to meet college requirements in communications, social sciences, fine arts and humanities, and physical education. Additional specific courses for each option will be selected with the help of the student's academic advisor. Course programs are individualized to meet the needs of each student. All students are encouraged to participate in field practical experiences and individual research.

Animal Sciences offers an excellent summer farm management course at the William H. Miner Agricultural Research Center, Chazy, NY. A full-time work-study experience, this course is organized around the entire set of events which takes place on the farm, from crop production to animal management. The professional staff at Miner are all faculty members in Animal Sciences.

### A Possible Curriculum in Dairy Production

Freshman Year	Hours
Agricultural Orientation	1
Intro. Animal Sciences	4
Biology	4-8
Inorganic Chemistry	4-8
Principles of Plant Science	3
Fundamentals of Nutrition	3
Principles of Agr. and Res. Econ.	3
Electives*	3-6
Sophomore Year	Hours
Animal Anatomy	4
Animal Feeding	4
Animal Health	3
Genetics	3-4
Intro. to Dairy Production	4
Organic Chemistry	4-8
Mathematics	3
Electives*	3-7
Junior Year	Hours
Livestock Production	4
Animal Physiology	4
Intro. Soil Science	4
Agricultural Finance	3
Animal Breeding	4
Markets, Food, and Consumers	3
Computer Science	3
Electives*	5-7
Senior Year	Hours
Seminar	1
Physiology of Reproduction	3
Dairy Herd Management	8
Forage Crops	3
Intro. Dairy Foods	3
Farm Business Management	3
Statistics	3
Electives*	8-10

\*Includes courses to meet college requirements and advanced courses for specific options.

### A Possible Curriculum in Preprofessional Science

Freshman Year	Hours
Agricultural Orientation	1
Biology 1, 2	8
Inorganic Chemistry	8

Introductory Animal Sciences	4
Fundamentals of Nutrition	3
Electives*	6-9

Sophomore Year	Hours
Organic Chemistry	8
Math. through Calculus	3-6
Genetics	4
Animal Feeding	4
Animal Anatomy	4
Electives*	6-9

Junior Year	Hours
Animal Production	3-4
Biochemistry	4
Animal Physiology	4
Microbiology	4
Physics	8
Animal Health	3
Electives*	5-8

Senior Year	Hours
Physiology of Reproduction	3
Endocrinology	4
Animal Production	3-4
Statistics	3
Computer Science	3
Animal Breeding	4
Electives*	10-12

\*Includes courses to meet college requirements and advanced courses for specific options. Many of the electives are normally taken in advanced science courses.

**DAIRY FOODS** Vermont has the only Dairy Foods program in New England, and thus qualifies for the New England Regional Student Program (see page 11). The program deals with many aspects involved in the handling, processing or manufacturing, quality management, research, marketing, and promotion of fluid milk and manufactured dairy products.

The Vermont half of the Northeast Dairy Foods Research Center, a consortium of scientists from Vermont and Cornell University is headquartered in the Dairy Foods program. This Center is involved in product safety, new product research and development, market testing of products, and continuing education for the dairy industry. These ties with industry strengthen the opportunities for students both in terms of cooperative education and postgraduate employment.

Four options are offered in the Dairy Foods program: (1) **dairy processing and quality management**, (2) **dairy production and foods**, (3) **preprofessional science**, and (4) **general**. Graduates have many job opportunities in whatever option they choose (many more jobs exist than qualified applicants) and are in demand by graduate colleges throughout the United States.

The core of courses which all Dairy Foods majors must take are: Agricultural Orientation, Chemistry, Computer Science, Fundamentals of Nutrition, Introductory Animal Science, Mathematics, Senior Seminar, and all of the courses offered in Dairy Foods; i.e. Introductory Dairy Foods, Dairy Testing and Quality Control, Processing Fluid Dairy Foods, Processing Frozen Dairy Foods, Sensory Evaluation of Dairy Foods, Food Microbiology, Fermented Dairy Foods, Dairy Industry Managerial Training. Each student must select elective courses to meet college requirements in communications, social sciences, fine arts and humanities, and physical education. In consultation with the academic advisor, students will select additional elective courses to meet their unique needs and interests.

Faculty members in the program assist students to obtain sum-

mer employment and encourage them to participate in other practical field experiences and/or individual research projects. Examples of prospective employers in the Northeast are: Agri-Mark, Inc.; Borden's; Colombo Yogurt; Cumberland Farms Dairy, Inc.; Express Foods, Inc.; Garelick Farms; H.P. Hood; Kraft Foods; Milk Promotion Services; Pollio Dairy Products Corp.; Sealtest Foods; Vermont Department of Agriculture; West Lynn Creamery; and Wyeth International LTD.

An example of a four-year curriculum in the dairy processing and quality management option follows.

### ***A Possible Curriculum in Dairy Processing and Quality Management***

Freshman Year	Hours
Agricultural Orientation	1
Chemistry	8
Economics	3
Intro. Animal Sciences	4
Mathematics	3-6
Electives*	9-12

Sophomore Year	Hours
Computer Science	3
Economics	3
Fundamentals of Nutrition	3
Intro. Dairy Foods	3
Microbiology	4
Statistics	3
Electives*	11

Junior Year	Hours
Business Courses	8
Food Microbiology	3
Dairy Testing and Quality Control	3
Economics	6
Fermented Dairy Foods	4
Processing Fluid Dairy Foods	3
Electives*	4

Senior Year	Hours
Business Courses	6
Dairy Industry Managerial Training	3
Economics	3
Senior Seminar	1
Sensory Evaluation of Dairy Foods	3
Processing Frozen Dairy Foods	3
Electives*	11

\*Includes courses for college requirements such as communication, social sciences, fine arts and humanities, and physical education.

### **BIOCHEMICAL SCIENCE**

The Department of Agricultural Biochemistry is the only department at the University of Vermont offering a program of undergraduate study leading to the Bachelor of Science degree in Biochemical Science. The program in Biochemical Science provides a coordinated sequence of study in biochemistry, biology, and chemistry and all majors meet or exceed the undergraduate requirements needed for admission to professional colleges, such as medicine, dentistry, veterinary medicine, and graduate school in biochemistry or any related biological science.

The Department faculty believe that excellence in teaching and student advising are a priority and all department courses are taught by faculty regardless of professional rank. In addition, the faculty are deeply committed to generating new knowledge through research and discovery and demonstrating to their

students the relevance of this research to our understanding of biochemistry and to the improvement of the quality of life for individuals in our society. Undergraduate majors in biochemical science are encouraged to enroll in undergraduate research (AGBI 197, 198) and join the department faculty as part of an active, productive research team.

The study of biochemistry is critical to an understanding of modern medical, biological, and agricultural sciences and students interested in careers in these areas are well advised to major in biochemistry during their undergraduate years. Depending on the student's interest and future plans, they elect one of three possible options or custom design their own option in consultation with their faculty advisor:

**Cellular Biochemistry** emphasizes the biochemical, physiological, and metabolic reactions of organisms.

**Molecular Biology** focuses on the structure and function of chromosomes and proteins, the control of gene expression, and the methods of analysis of recombination of DNA.

**Mammalian Biochemistry** emphasizes the hormonal and nutritional control of biochemical pathways in mammals and the related metabolic and endocrine adaptations.

### Required Courses in Biochemical Science

#### I. General Education Requirements for All Majors:

- A. Communication Skills:
 

English I	Written Expression
Speech II (or equivalent)	Effective Speaking
- B. Analytical skills (See below section II,D):
- C. Humanities and Fine Arts:
 

Two unspecified courses (six credits)
- D. Social Science:
 

Two unspecified courses (six credits)
- E. College of Agriculture and Life Science Orientation:
 

Agriculture 99	Beginnings
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- F. Physical Education:
 

Two credits

#### II. Biochemical Science Core Requirements for All Majors:

- A. Biochemical Science:
 

Ag. Biochem. 10	Introductory Biochemistry
Ag. Biochem. 201, 202	General Biochemistry plus laboratory
Ag. Biochem. 220, 221	Molecular Biology plus laboratory
Ag. Biochem. 230, 231	Advanced Biochemistry plus laboratory
One additional elective Ag. Biochem. course.	
- B. Chemical Science:
 

Chemistry 1,2	Introductory Chemistry
Chemistry 141,142	Organic Chemistry
- C. Biological Science:
 

Biology 1,2	Principles of Biology
Microbiology 55,57	Introductory Microbiology
Biology 101	Genetics
Botany 132	Elementary Genetics
- D. Physics and Mathematical Science:
 

Physics 31,42	Introductory Physics and Electromagnetism and Modern Physics (recommended for premedical programs)
or	
Physics 11,12	Elementary Physics (advisor's permission required)

Math. 19,20	Fundamental of Calculus I,II
or	
Math. 21,22	Calculus I,II
Voc. Ed. & Tech. 85	Microcomputer Applications in Agricultural and Life Sciences
or	
Computer Sci. 3	Computers and Their Application

#### III. Biochemical Science Option Requirements:

Successful completion of three courses numbered at or above the 100 level are required in one of the following options:

- A. Cellular Biochemistry:
 

Suggested courses: Ag. Biochemistry 191, Biochemistry of Nucleic Acids; Botany 257, Physiology of Plant Cell; Microbiology 254, 255, Microbial Biochemistry; Biology 103, Cell Structure and Function; Biology 255, Structure and Function of Chromosomes; Zoology 223, Biochemical Embryology.
- B. Molecular Biology:
 

Suggested courses: Ag. Biochemistry 191, Biochemistry of Nucleic Acids; Botany 252, Molecular Genetics II; Regulation of Gene Expression in Eukaryotes; Biology 255, Structure and Function of Chromosomes; Microbiology 211, Molecular Genetics I; Zoology 216, Human Genetics.
- C. Mammalian Biochemistry:
 

Suggested courses: Ag. Biochemistry 191, Biochemistry of Nucleic Acids; Biochemistry 212, Biochemistry of Human Disease; Zoology 223, Biochemical Embryology; Animal Sciences 120, General Physiology; Animal Sciences 216, Endocrinology; Microbiology 203, The Mammalian Cell in Biomedical Research; Pharmacology 272, Toxicology; Nutritional Sciences 242, Advanced Nutrition, Nutritional Sciences 245, Nutritional Biochemistry.
- D. Student Designed Biochemistry Option (in consultation with faculty advisor):
 

Three 100-level science courses.

### BIOLOGICAL SCIENCES

Some of the most exciting and controversial developments in our society are in the biological sciences. Biotechnology is providing the opportunity for *in vitro* fertilization, embryo transfer, embryo sexing, synthesis of hormones to regulate body processes, and gene transfer to increase growth.

The Biological Science major starts with the Core Program discussed previously (page 46). In conjunction with a personal faculty advisor, each student will plan a curriculum appropriate for the individual's career goal. Specific courses will be selected from a current UVM catalogue and include the major requirements. Students are urged to participate in undergraduate research and can work directly with a faculty scientist on the cutting edge of research. This unusual opportunity has resulted in several students publishing results in major scientific journals. While each program of study is personalized, all graduates must complete the College requirements and the following *major requirements*: Biological Science Core, one semester each of anatomy, biochemistry, ecology, microbiology, physiology, statistics, and two semesters of physics. In addition, each student must satisfactorily complete an undergraduate research project or an advanced biological science course at the 200 level or above. These courses may be selected from the diverse offerings from departments throughout the University. This program requires the successful completion of 122 credit hours of courses to earn the Bachelor of Science degree.

Recent graduates have gone to some of the best medical, dental, and veterinary schools in the country after earning their Bachelor of Science degree. A larger proportion of students have gone on to graduate studies leading to the Ph.D. degree in microbiology, biochemistry, nutrition, physiology, reproduction, endocrinology, genetics, and molecular biology for example. Other students go into a university or industrial positions as research laboratory technicians or sales and management jobs requiring a scientific background. Hence, our graduates are well prepared with many career-oriented, marketable skills.

### Possible Four-Year Curriculum

	1st	2nd
	SEMESTER	
<b>FRESHMAN YEAR</b>		
Beginnings 99	1	-
Biology 1,2	4	4
Chemistry 1,2	4	4
English 1	3	or 3
Nutrition 43	3	or 3
Elective*	0-3	4-6
<b>SOPHOMORE YEAR</b>		
	1st	2nd
	SEMESTER	
Organic 141,142	4	4
Calculus 19,20	3	3
Botany 132	3	-
Statistics 141	-	3
Anatomy	4	-
Computer Sci./Voc. Ed. & Tech.	-	3
Elective*	2-4	2-5
<b>JUNIOR YEAR</b>		
	1st	2nd
	SEMESTER	
Physics 11,12	3	3
Physics Lab 21,22	1	1
Microbiology 55	2	or 2
Lab 57	2	or 2
Physiology	4	or 4
Elective*	7-10	7-10
<b>SENIOR YEAR</b>		
	1st	2nd
	SEMESTER	
Biochemistry 201	3	-
Lab 210	1	or 1
Ecology - Botany 160	-	4
Advanced Biology	4	or 4
Undergraduate Research	3	3
Elective*	4-7	8-11

\*Electives include courses to meet the College requirements for communications, social sciences, and the humanities and fine arts, as well as advanced courses for specific concentrations or general interest.

### BOTANY

Students in the Colleges of Agriculture and Life Sciences or Arts and Sciences may major in Botany. Each undergraduate plans a program in consultation with a personal departmental advisor. The emphasis on flexibility permits a choice of electives when planning for each individual's career. Cross-disciplinary study is encouraged as botany, a fundamental science, is the base upon which education, research, and careers in both applied and basic plant science is built. Many students aim specifically for careers that do not require formal education beyond the Bachelor's degree, e.g. preparation for numerous positions in: agriculture, business, education, administration, government, industry, medicine, research, or their own businesses. Many other students prepare themselves for graduate education and professional careers requiring advanced degrees, e.g. careers in botany, biology, medicine, den-

tristry, agriculture, biochemistry, or environmental sciences. In either case, close attention is given to increasing the student's choices after college. Students are also encouraged in their senior year to enrich their botanical experience through individualized, original research and study with faculty members. Areas of interest include: anatomy, cell botany, cytology, ecology, phycology, physiology, plant development, plant pathology, and taxonomy.

Required courses: Math. 22; or Math. 21 and Statistics 141 or 211; or Math. 19, 20 and Statistics 141 or 211, Physics 21, 22; and 11, 12 or preferably 31, 42; Chemistry 42 or preferably 141, 142; Biology 1, 2; Botany 101 or 132, 104, 107, 108, and 109 or 160; two additional semester courses in Botany, at least one at the 200 level.

Six hours of modern foreign language are strongly recommended. Students may petition the department to substitute other courses for certain requirements in the planning of individual programs.

### ENVIRONMENTAL STUDIES

The College of Agriculture and Life Sciences participates in the interdisciplinary University Environmental Program as described on page 39. Students may elect either the Coordinate Major and fulfill the requirements of one of the major programs in the College or the Major in Environmental Studies.

### MERCHANDISING, CONSUMER STUDIES, AND DESIGN

The Department prepares students for careers in business and industry, education, extension, and government, or for pursuing graduate study. Practical as well as theoretical approaches are presented and examined in the three program areas: consumer studies, fashion merchandising, and related art. Although diverse in substance, the areas are joined by their concern and relationship with consumer needs and behaviors. Scientific, artistic, or business approaches to the product areas of the textiles and clothing fields and consumer orientations to other products and services in general can be pursued in this multi-faceted department.

A core of general education courses in the social, natural, and quantitative sciences; humanities; and communication combine with professional courses in Consumer Studies, Fashion Merchandising, and Related Art to build these interdisciplinary majors. Career exploration through professional seminars and field experiences enhances the student's awareness of the professions as well as tests the appropriateness of potential careers to the student's needs. Students may co-enroll in the Home Economics Program with any of the three majors. This requires completion of professional course requirements as well as home economics core requirements and two seminars focusing on theoretical and practical implementations of the home economics field. (See page 40 for complete description.)

**Consumer Studies:** This major addresses the interaction of economic, social, and political conditions as they affect the consumer. An understanding of the relationship of management and motivation to consumer problems, and the impact of public and private sector institutions, forms the basis of a flexible program of study. Majors select their courses to provide a career orientation in business, public service, or human services.

**Fashion Merchandising:** This major combines a knowledge of textiles and apparel with the business and management skills required in retailing. Accounting, marketing, advertising, statistics, and computer science courses complete the fashion merchandising student's professional preparation. Career possibilities include retail and wholesale buying and selling, marketing, and promotion of consumer goods, particularly in the apparel or textiles areas.

**Related Art:** This major offers preparation in both apparel and textile design. Students apply the elements and principles of design in weaving, dyeing, and printing fabric and creating apparel by draping and flat pattern techniques. Alternative needs and end uses are evaluated during the design process, utilizing supporting courses in history and the social and physical sciences. Students are prepared for a variety of positions in the textile and apparel industries including design, sales and educational representatives, apparel and textile production, and management.

Specific degree requirements are available in the department office, Terrill 211.

## MICROBIOLOGY

The study and application of information obtained in Microbiology has considerable importance in health, agriculture, ecology, and industry. Students planning a career focused on any of these areas are well advised to obtain a solid foundation in microbiology and related disciplines. To accomplish this goal, the program in microbiology provides a coordinated sequence of study in such foundational sciences as biology, mathematics, chemistry, and biochemistry coupled with a strong preparation in microbiology. This program has the following concentrations: general microbiology, microbial biotechnology, molecular genetics, cell biology, immunology, host-parasite interactions, applied microbiology, and clinical microbiology. Specialization in one of these concentrations commences in the third year, after completion of college distribution and program core requirements. A graduate from this program would be qualified for laboratory positions in industry, for federal, state, and university positions related to control and use of microorganisms, as well as other positions requiring an understanding of contemporary microbiology. Completion of these studies will give the student the background to consider employment in food or agricultural industries, chemical and pharmaceutical companies, companies producing products by recombinant DNA technology, or organizations involved with biomedical research and public health. In addition, the program through its concentration in Clinical Microbiology, used as a Microbiology Specialty Option, can lead to certification by the American Society for Microbiology and thus enable the graduate to work as a microbiologist in hospital environments. This program will also provide a foundation for graduate work in microbiology, molecular biology, cell biology, and biotechnology.

## NUTRITIONAL SCIENCES

The Department of Nutritional Sciences prepares students to enter the rapidly growing field of nutrition and/or foods. Such preparation requires a strong foundation in basic science including chemistry, physiology, microbiology, and biochemistry. The Department recognizes the importance of general education and majors are required to complete courses in psychology, sociology, English composition, speech, statistics, computer science, and the humanities.

The course credits earned in Nutritional Sciences provide background in normal, cellular, and therapeutic nutrition as well as nutrient requirements for growth, development, and health at various stages of the life cycle. Other courses focus upon physical, chemical, and nutritional properties of food, food science and food technology, and consumer aspects of food as related to socioeconomic status, lifestyle, cultural beliefs, and state of health. Although a series of courses providing information in these areas is required of all majors, each student has a choice of electives. Students may major in Dietetics (Plan IV with a general or clinical emphasis approved by the American Dietetic Association) or Nutritional Sciences.

It is possible to meet the requirements for more than one option or to combine a major in this Department with another

area of study. Students may choose to meet medical school entrance requirements as part of their program. Co-enrollment in the Home Economics Program (see page 40 for complete description) along with a major in Dietetics or Nutritional Sciences may be particularly appropriate for nutrition professionals who plan to work with families in community-based settings.

**Dietetics:** This major is designed to meet the Plan IV Academic Requirements with a general or clinical emphasis which is approved by the American Dietetic Association. To become a registered dietitian, the academic requirements and a postbaccalaureate clinical experience must be completed. This curriculum provides a solid background in basic science, normal and therapeutic nutrition, foods, and quantity food management. Career opportunities include hospital dietetics as well as community nutrition programs, quantity food management, or graduate school.

**Nutritional Sciences:** This major is designed to provide a strong background in basic science, normal nutrition, and foods with an opportunity to complete further course work in food science, biological science, social science, or business. Graduates may find career opportunities with food companies, food management companies, pharmaceutical companies, research laboratories, community nutrition programs, government agencies, and the Extension Service, or graduate school.

## PLANT AND SOIL SCIENCE

The Plant and Soil Science program has several specialized options designed for students interested in horticultural crops, agronomic crops, soils, pest management, and alternative agriculture as they relate to the science of food, feed, and fiber production or to recreation and the environment. The program is flexible and allows students to place their primary emphasis in either science or agribusiness which prepares students for many employment opportunities, including agribusiness sales and service, agricultural extension, farming, soil and water management, and land use planning. Suggested options have been developed by the Department to be used as guides for students interested in careers in general plant and soil science, agronomy, horticulture, soil science, and pest management. Specific courses, in addition to the core courses, are worked out between the student and the advisor.

**Agromony:** This option concerns the production and management of field crops, forage crops, and pastures for food, feed, and fiber as well as turfgrasses for landscaping and reducing soil erosion. Students learn to apply plant and soil principles to the care, improvement, and wise use of soils and land resources.

**Alternative Agriculture:** This option is oriented toward an agriculture that strives to lessen dependence on inputs from off the farm. Emphasis is on understanding balanced soil-crop-animal ecological systems. Students gain training and experience needed for working in agriculture in ways that minimize environmental pollution and decrease dependence on non-renewable resources.

**Horticulture:** This option studies the varied field production, use, and marketing of fruits and vegetables for food production, and flowers, shrubs, and trees for ornamental use. Plants, the man-made environment, and the natural environment are considered in Landscape Design.

**Pest Management:** This option considers the protection of crops from insects, diseases, and weed competition. Students learn to integrate and apply biological, cultural, and high technology principles of pest control to farm management systems. A strong emphasis of electives in biological sciences is worked out between the student and advisor.

**Soils:** This option is directed mainly toward the soils as they relate to growing plants. Soil chemical, biological, and physical conditions and their influences on soil fertility are of major

concern. In addition, other important soil-related issues may be pursued, such as water-sediment chemistry, soil conservation, soil mapping, and use of soils for environmental purposes.

**General:** This option is designed for students interested in developing a broad background in Plant and Soil Science without a major emphasis in any one crop production or specialty area. It is most useful to the individual concerned with diversification of farm production.

All students majoring in Plant and Soil Science must take Principles of Plant Science, Introductory Soil Science, Soil Fertility and Management, one semester of Seminar, two semesters of chemistry (one semester of inorganic and one semester of organic), plant pathology, and insect pest management. A minimum of six additional courses in Plant and Soil Science at the 100 level or above are required, to be selected in the student's area of interest and approved by the student's advisor. Courses in related areas may be substituted for one or two of these six courses with the consent of the student's advisor. In addition, students must complete the College requirements in mathematics or statistics, computers, social sciences, humanities, and communication skills.

**Required Core Courses**

	Hours
Plant and Soil Science:	
11, Principles of Plant Science	3
106, Insect Pest Management	4
161, Introductory Soil Science	4
162, Soil Fertility and Management	3
281, Seminar	1
Botany:	
104, Plant Physiology	4
117, Plant Pathology	4
Chemistry 3	4
Chemistry 42 or 4	4
Six additional Plant and Soil Science courses at or above the 100 level	18-20

**COMMUNITY FORESTRY AND HORTICULTURE**

Community Forestry and Horticulture provides a professional education in the use and care of trees, shrubs, lawn grasses, and other plants in the human environment. Landscape design and contracting, urban forestry, park supervision, and garden center management are some of the professions in this expanding field.

The program integrates professional training in landscape design and the plant sciences with courses in business and the liberal arts. The emphasis is to prepare students for the changing future and a variety of careers in the expanding field of Community Forestry and Horticulture.

A minimum of 120 credit hours of specified and elective courses is required for graduation. Students are encouraged to participate in internships related to their studies; these internships provide valuable work experience and professional contacts.

	1st	2nd
	SEMESTER	
<b>FRESHMAN YEAR</b>		
Agric. 99, Beginnings	1	-
Plant and Soil Sci. 7, Orientation to Comm. For. and Hort.	1	-
Math. 10, Pre-calculus or Statistics <sup>1</sup>	3	-
Forestry 3, No. American Trees	3	-
English 1, Written Expression	3	-

<sup>1</sup> Students not having trigonometry in high school should also take Math. 2.

Plant and Soil Sci. 11, Princ. Plant Sci.	3	-
Chemistry 3, Gen'l Chem.	-	4
Speech 11, Effective Speaking	-	3
Computer Sci. 3 or 11 or Voc. Ed. & Tech. 85	-	3
Phys. Ed.	1	1
Other Courses <sup>2,3</sup>	-	4
	15	15

	1st	2nd
	SEMESTER	
<b>SOPHOMORE YEAR</b>		
Plant and Soil Sci. 161, Intro. Soil Sci.	4	-
Voc. Ed. & Tech. 25, Measurements and Mapping	4	-
Agr. and Res. Econ. 61, Princ. Agr. Res. Econ.	3	-
Voc. Ed. & Tech. 2, General Shop	3	-
Plant and Soil Sci. 162, Soil Fert. and Mgmt.	-	3
Botany 104, Plant Physiology	-	4
Nat. Res. 51, Env. Aesthetics and Planning	-	3
Forestry 120, Forest Ecology	-	4
Other Courses	1	1
	15	15

	1st	2nd
	SEMESTER	
<b>JUNIOR YEAR</b>		
Plant and Soil Sci. 145, Turfgrasses	3	-
Plant and Soil Sci. 125, Woody Ornamentals	4	-
Forestry 133, Forest Entomology	3	-
Agr. and Res. Econ. 166, Small Bus. Mgmt. or Bus. Admin. 120, Princ. of Mgmt.	-	3
Plant and Soil Sci. 131, Landscape Design I	3	-
Plant and Soil Sci. 132, Landscape Design II	-	3
Forestry 134, Forest Pathology	-	4
Other Courses <sup>2,3</sup>	2	5
	15	15

	1st	2nd
	SEMESTER	
<b>SENIOR YEAR</b>		
Nat. Res. 235, Legal Aspects of Planning and Zoning	3	-
Rec. Mgmt. 255, Environ. Interp.	3	-
Forestry 176, Urban Forestry	-	3
Co-op Program or Other Courses <sup>2,3</sup>	9	12
	15	15

<sup>2</sup> Select two three-credit courses from anthropology, economics, geography, political science, psychology, or sociology.

<sup>3</sup> Select two three-credit courses from arts and humanities: art, classics, English, foreign language, general literature, history, music, philosophy, religion, or theatre.

**THE SELF-DESIGNED MAJOR**

The Self-Designed Major is an individualized program in the College of Agriculture and Life Sciences providing students with the opportunity to create a unique academic major under the guidance of a faculty advisor. It offers students the chance to combine various areas from within the College. Students may enroll in a broad range of subjects or may elect to focus on one or two. Participants are encouraged to complement their



core design with relevant courses selected from all areas of the University. Off-campus experiences such as Co-op and internships may be incorporated into the Self-Design Major.

Students interested in becoming a Self-Designed Major must:

- Have accumulated no more than 80 credit hours at the time they begin the program; if this requirement prevents a student from pursuing a valid program, the student and faculty advisor may discuss the proposal with the Dean's Office of the College of Agriculture and Life Sciences.
- Fulfill all College distribution requirements.
- Complete 40 credits in courses offered by the College of Agriculture and Life Sciences; 20 of the 40 must be 100-level or higher.
- Discuss the proposed major with and receive the approval from a designated faculty advisor.
- Present the faculty-approved proposal to the Dean's Office for final approval.

**VOCATIONAL EDUCATION AND TECHNOLOGY**

The VOTEC department offers three major programs: (1) Occupational and Extension Education, (2) Home Economics Education, and (3) Agricultural and Energy Technology. These programs are flexible and provide several areas of professional concentration. Certain concentrations may be completed either as a major in this department, or as a teacher certification option combined with another program at the University. The requirements of some VOTEC programs can be met without having to attend the University campus on a full-time basis. Courses of general interest are available to all students in the University.

**OCCUPATIONAL AND EXTENSION EDUCATION** Three occupational areas of concentration (Agriculture and Natural Resources, Industry, and Health) prepare students for teaching certification. Extension Education prepares students for adult education responsibilities in governmental agencies, private organizations, business, and industry. Students desiring teacher certification must apply for admission to teacher education, and students choosing the Extension Education concentration must declare their intent prior to the beginning of their junior year. Contact the Department office, 108 Agricultural Engineering Building.

Teacher certification concentrations are offered in cooperation with the College of Education and Social Services. Selected programs have been approved under the Vermont State Department of Education Program Approval Plan and have reciprocity certification in selected states. Courses in the College of Education and Social Services will be included in teacher certification concentrations.

**Agricultural and Natural Resources Education:** Preparation to teach grades 7-12 agricultural or renewable natural resource subject areas. Field experiences are provided in secondary school settings. There are two options for teacher certification: (1) Agricultural and Natural Resources Education Major, and (2) a teacher certification option for students in the College of Agriculture and Life Sciences or the School of Natural Resources.

Typical Curriculum

	1st	2nd
	SEMESTER	
<b>FRESHMAN YEAR</b>		
Voc. Ed. & Tech. 52*	3	-
Voc. Ed. & Tech. 85	3	-
English 1	3	-
Math. 9	3	-
Speech 11*	-	3
Ag. and Res. Econ. 61	-	3
Chemistry 3	-	4
Biology 1	-	3

Electives**	3	3
Phys. Ed.	1	1
	<hr/>	<hr/>
	16	17

	1st	2nd
	SEMESTER	
<b>SOPHOMORE YEAR</b>		
Psychology 1	3	-
Phys. Ed.	1	-
Educ./Read 137, 138 or 223	3	-
Educ./Gen'l 2*	-	3
Educ./Lrng. Stds. 45 or 46*	-	3
Sociology 1	-	3
Electives**	9	6
	<hr/>	<hr/>
	16	15

**JUNIOR AND SENIOR YEARS**

Voc. Ed. and Tech.-Voc. Ed.-151, 152, 155, 270, 292\*  
 Educ./Elem. 122 or 134, Educ./Sec. 137, 138 or 223\*  
 Electives\*\*

\*The teacher certification option for students in the College of Agriculture and Life Sciences or the School of Natural Resources provides courses selected to meet specific state and national certification requirements.

\*\*Elective courses in the subject to be taught, including specific state and national requirements for certification, to be selected with the approval of advisor.

**Industrial Education:** Industrial Arts and Vocational fields are included in this concentration. Industrial Arts Field — preparation to teach six I.A. subject areas commonly found in grades 7-12. Vocational Field — preparation to teach a specialized trade or industrial subject in grades 11-12. At least two years of acceptable experience in business, industry, or the military is required before the degree can be awarded in the vocational field.<sup>1</sup>

Typical Curriculum

	1st	2nd
	SEMESTER	
<b>FRESHMAN YEAR</b>		
Voc. Ed. & Tech. 20	3	-
Voc. Ed. & Tech. 52	3	-
English 1	3	-
Math. 9	3	-
Voc. Ed. & Tech. 1	3	-
Phys. Ed.	1	-
Voc. Ed. & Tech. 6	-	2
Voc. Ed. & Tech. 30	-	3
Speech 11	-	3
Voc. Ed. & Tech. 85	-	3
Chemistry 3	-	4
Phys. Ed.	-	1
	<hr/>	<hr/>
	16	16

	1st	2nd
	SEMESTER	
<b>SOPHOMORE YEAR</b>		
Voc. Ed. & Tech. 131, 132	3	-
Physics 11 or 12	3	-
Psychology 1	3	-
Electives*	6	3
Voc. Ed. & Tech. 105	-	3
Ag. and Res. Ec. 61	-	3
Educ./Gen'l 2	-	3
Educ./Lrng. Stds. 45 or 46	-	3
	<hr/>	<hr/>
	15	15

**JUNIOR AND SENIOR YEARS**

Voc. Ed. and Tech. - Voc. Ed. - 151, 152, 155, 270, 292  
 Voc. Ed. and Tech. - 35, 110, 141, 145, 162, 165  
 Educ./Elem. 122 or 134, Educ./Sec. 137, 138, or 223  
 Electives\*

\*Electives to meet College and program requirements, including specific state and national requirements for certification, to be selected with the approval of advisor. Minimum requirement for graduation is 122 semester hours, including physical education.

**Health Occupations Education:** Preparation to teach occupationally-oriented subjects in grades 10-14. Available only to students who have completed a recognized training program in a health occupation and are licensed. A minimum of two years of experience in a health occupation is required before a degree is awarded.<sup>1</sup>

Typical Curriculum		Hours
<b>General Education</b>		
Two courses in writing, communication, and public address (e.g. English 1, Speech 11)	6	
Two courses in science, mathematics, and statistics (e.g. Math. 9, Chemistry 3)	6	
Two courses in social sciences (e.g. Psychology 1, Political Science 3)	6	
Two courses in fine arts and humanities (e.g. Theatre 5, Philosophy 3)	6	
<b>Professional Education</b>		
Voc. Ed. and Tech. 52, 151, 152, 155, 270, 292 Educ./Gen'l 2, and Educ./Lrng. Stds. 45 or 46, Educ./Elem. 122 or 134, Educ./Sec. 137, 138, or 223	23-28	
	12	
<b>Technical Education</b>		
Completed prior to acceptance into baccalaureate degree program.		

<sup>1</sup>Several paths lead either to a degree, teacher certification, or both. A degree may be earned on a full-time basis, or on a part-time basis while employed in industry or teaching. Persons entering teaching directly from industry may earn teacher certification through the Transition Into Education (T.I.E.). Qualified individuals may start as nondegree students and seek admission to a degree program after satisfactorily completing specified courses.

Persons having two or more years of appropriate work or military experience may qualify for up to 30 credits by successfully completing National Occupational Competency Institute Examinations. Students with less than two years experience may qualify for the off-campus technical internship.

Qualified nondegree students seeking teacher certification will complete professional Vocational Education and Technology courses plus selected courses in the College of Education and Social Services.

**Extension Education:** Preparation for adult educational responsibilities in government agencies, private organizations, business, and industry by majoring in another program in the University and completing this concentration concurrently. Field practicum experiences are provided. Professional courses include Vocational Education and Technology 82, 182, 183, 184, 283.

**HOME ECONOMICS EDUCATION**

Because of the comprehensive scope of Home Economics Education, graduates with this major have a variety of career alternatives in business, social agencies, and different types of educational programs for youth and adults. Graduates are prepared to teach in public schools in consumer and home-making fields such as family living, child development, consumer education, food and nutrition, housing and interiors,

clothing and textiles, and management found in middle, junior, and high school home economics programs. Home Economics Education graduates can be certified to teach in occupational home economics programs, including human service education and culinary arts. Experience in business or industry is needed to teach in an occupational program.

Students are enrolled in the interdisciplinary Home Economics Program (see page 40).

Typical Curriculum		1st	2nd
<b>FRESHMAN YEAR</b>			
<b>SEMESTER</b>			
Voc. Ed. & Tech. 52	3	-	-
Psychology 1	-	-	3
Sociology 10	3	-	-
English 1	3	-	-
Math. 9	-	-	3
Home Economics Seminar	-	-	3
Chemistry 3	4	-	-
Chemistry 4	-	-	4
Mdsng., Cons. Stds., & Design 15	-	-	3
Nutritional Sciences	3	-	-
Phys. Ed.	1	-	-
	17	-	16
<b>SOPHOMORE YEAR</b>			
<b>SEMESTER</b>			
Economics 11 or Ag. and Res. Ec. 61	-	-	3
Speech 11	3	-	-
Humanities Electives	3	-	3
Science Elective	4	-	-
Nutritional Sciences	3	-	-
Mdsng., Cons. Stds., & Design 56	-	-	3
Mdsng., Cons. Stds., & Design 20	-	-	3
Mdsng., Cons. Stds., & Design 51	-	-	3
Educ./Gen'l. 2	3	-	-
Phys. Ed.	1	-	-
	17	-	15

Additional home economics courses and electives to meet College and concentration requirements including specific state and national requirements for certification, to be selected with the approval of advisor.

**AGRICULTURAL AND ENERGY TECHNOLOGY**

This program offers students a choice of two concentrations, one leading to a Bachelor of Science degree and one which provides the first two years of a Bachelor of Science in Agricultural Engineering (B.S.A.E.) degree.

**Agricultural and Energy Technology:** This concentration combines applied technical courses in the areas of energy and power, structures, utilities, machinery, industrial production; and complementary offerings from other departments to provide a program of study containing both depth and breadth. Agricultural and Energy Technology graduates find employment in agribusiness, construction, manufacturing, and public service.

Typical Curriculum		1st	2nd
<b>FRESHMAN YEAR</b>			
<b>SEMESTER</b>			
English 1	3	-	-
Math. 9 or 10	3	-	-
Voc. Ed. & Tech. 1, Drafting	3	-	-
Voc. Ed. & Tech. 6, Energy	3	-	-
Phys. Ed.	1	-	1
Voc. Ed. & Tech. 85, Microcomputers	-	-	3

Math, 17 or 21	-	3
Chemistry 3 or 5	-	4
Voc. Ed. & Tech. 35, Welding	-	3
Electives*	3	3
	<hr/>	<hr/>
	16	17
	1st	2nd
	SEMESTER	
SOPHOMORE YEAR		
Physics 11, 12	3	3
Civil Engr. 12, Surv.	4	-
Voc. Ed. & Tech. 131, 132, Bldgs.	4	-
Voc. Ed. & Tech. 10, 141, Auto Basics	-	4
Ag. and Res. Ec. 61	-	3
Statistics 111	-	3
Voc. Ed. & Tech. 165, Elec. & Electronics	3	-
Electives*	3	3
	<hr/>	<hr/>
	17	16

**JUNIOR AND SENIOR YEARS**

Voc. Ed. and Tech. - 162, 170, 182, 282, and Voc. Ed. and Tech. 150, technical internship.  
Ag. and Res. Econ. 166, Speech 11.  
Electives\*

\*To include four general electives to meet College requirements plus one biological science elective and five technical electives to be selected with approval of advisor. Minimum requirement for graduation is 120 credit hours plus two hours of physical education.

**Professional Agricultural Engineering – B.S.A.E.:** The first two years of a professional engineering curriculum. The last two years of the professional program must be completed at an institution offering a Bachelor of Science in Agricultural Engineering degree. Vermont resident students in good standing may complete their studies at the University of Maine, under a special arrangement which allows them to pay the same tuition rate as Maine residents.

Preparation for professional engineering work in soil and water control, agricultural machinery and equipment, agricultural structures, the application of electricity and refrigeration to agriculture, and rural water supply and sanitation. The graduate is also prepared for research and graduate study in agricultural engineering. (Freshman admission at the Maine-resident tuition rate to this curriculum at the University of Maine will be allowed for Vermont-resident students wishing to take all four years at one institution.)

**MINORS****SPECIFIC MINOR REQUIREMENTS**

Any student in the College of Agriculture and Life Sciences interested in enrolling in one of the following minors should contact the department administering the program. If accepted, the student will be assigned a "minor advisor" from that department who must approve all program plans and course selections.

**Agriculture and Energy Technology:** Fifteen credit hours of technology courses within the Department of Vocational Education and Technology, of which nine must be at the 100 level or above.

**Agricultural and Resource Economics:** Agricultural and Resource Economics 61, 201, 207; and at least two of the following: 208, 254, 264.

**Biological Sciences:** Biology 1 and 2 plus a sequence of three semester courses (nine to 12 credits) in the biological sciences selected with advice of the faculty advisor and approved by the program chair. The courses are selected to provide a relevant extension of the student's major program into the biological sciences.

**Consumer Studies:** Eighteen credit hours including three core courses (Merchandising, Consumer Studies, and Design 58, 157, 159); a choice of emphasis (either Merchandising, Consumer Studies, and Design 56 or 158 and either Merchandising, Consumer Studies, and Design 127 or 155); and one elective course chosen from Merchandising, Consumer Studies, and Design 51, 56, 127, 128, 155, 158, 159, 291, or 296.

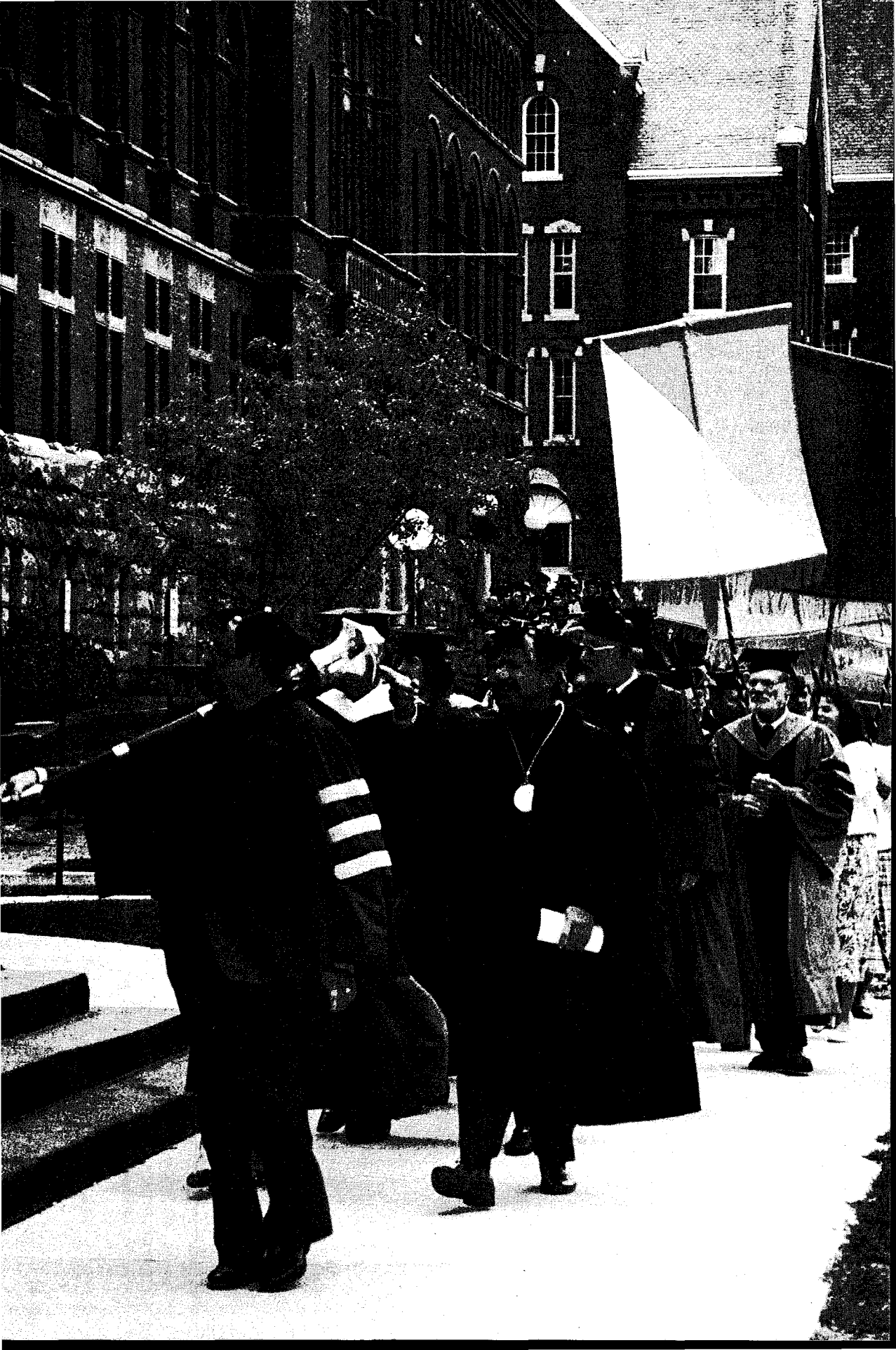
**Fashion Merchandising:** Eighteen credit hours including five core courses (Merchandising, Consumer Studies, and Design 15, 20, 107, 125, 126) and one elective course chosen from Merchandising, Consumer Studies, and Design 121, 127, 128, or 296.

**Nutritional Science:** Fifteen credit hours in Nutritional Sciences including at least six credits at the 200 level. Independent study or field experience cannot be counted in this total.

**Plant and Soil Science:** Plant and Soil Science 11, 161, plus any three additional Plant and Soil Science courses at the 100 level or above.

**Related Art:** Eighteen credit hours including two core courses (Merchandising, Consumer Studies, and Design 15 and 16); a choice of emphasis (either 114, 115, 116 or Merchandising, Consumer Studies, and Design 107, 122, 222); and one elective course chosen from Merchandising, Consumer Studies, and Design 117, 195, 197, 223, 231, 291, 296.

**Small Business Management:** Agricultural and Resource Economics 61, 166, 167, 168, 266.



# The College of Arts and Sciences

Throughout its history, the College of Arts and Sciences has held that its central purpose is to provide students with a sound liberal education. Congruent with this central purpose, the College seeks to instill in students a spirit of reasoned inquiry and those habits of intellectual discipline which are required for the critical thinking expected of free men and women. The College further seeks to acquaint students with their intellectual, cultural, and aesthetic heritage, and to provide them the skills necessary to cope with the complex human, societal, and technological problems of modern society. Finally, the College seeks to prepare students for entry into rewarding careers in a variety of fields and for advanced study that may be prerequisite to other opportunities. These objectives of a liberal education are achieved through the courses of instruction which form the undergraduate curricula of the College. Through satisfaction of the general and distributive requirements, students acquaint themselves with the diversity of approaches whereby people have come to understand themselves and their environment. As well, through satisfaction of the major and minor requirements, students can attain baccalaureate level mastery of a particular discipline or interdisciplinary area and significant depth of study in a second discipline or interdisciplinary area.

The offices of the Dean of the College are located in Waterman Building.

## ORGANIZATION AND DEGREE PROGRAMS

The Bachelor of Arts degree program may be completed with an approved major in one of the following fields:

Anthropology	Greek
Area Studies	History
Art History	Latin
Art - Studio	Mathematics
Biology	Music
Botany	Philosophy
Chemistry	Physics
Classical Civilization	Political Science
Communication Science and Disorders	Psychology
Economics	Religion
English	Russian
Environmental Studies	Sociology
French	Spanish
Geography	Theatre
Geology	Zoology
German	Individually Designed Major

The Bachelor of Science degree program may be completed with an approved major in one of the following fields:

Biology	Physics
Chemistry	Zoology
Geology	

The Bachelor of Music degree program may be completed with an approved major in one of the following fields:

Music Performance	Music Theory
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## DEGREE REQUIREMENTS

Students must comply with the degree requirements as stated in the catalogue applicable when the student enters the University. However, students who do not complete the degree within seven years must comply with the requirements in the catalogue current at the date of readmission. Disputed rulings may be appealed to the Committee on Academic Standing.

## REQUIREMENTS FOR THE BACHELOR OF ARTS DEGREE

- A. A student must earn a cumulative grade-point average of 2.0 in a program comprised of a minimum of 122 semester hours of academic credit. Of the 122 hours of credit, 96 hours must be taken in courses offered by departments and programs with approved majors in the College of Arts and Sciences and **two** hours must be associated with physical education activities. The remaining 24 hours of credit may be taken in courses offered by any academic unit of the University of Vermont, although no more than eight credits of Military Studies may apply toward the degree. Courses taken on a pass/no pass basis may *not* be used toward completion of any requirement listed below under sections C-E.
- B. A student must be matriculated in the College of Arts and Sciences and in residence at the University of Vermont during the period in which he or she earns 30 of the last 45 hours of academic credit applied toward the degree.
- C. A student must complete the following courses which comprise the general and distributive requirements for the Bachelor of Arts degree. All courses used to satisfy these requirements must carry a least three hours of credit, and may not be taken on a pass/no pass basis.

1. **Foreign Language:** One course numbered 52, or in Latin, 51 and 52, or one course numbered 100 or above. A student who has achieved a score of 4 or better on an appropriate Advanced Placement Test will be exempted from this requirement.<sup>1</sup> Exemption will also be granted to those students who achieve a score of 650 or better on the appropriate CEEB Achievement Test and who pass oral and written tests administered by the appropriate foreign language department.
2. **Mathematics:** One course numbered 17 or above. A student who has achieved a score of 3 or better on the Calculus AB or a score of 2 or better on the Calculus BC Advanced Placement Tests will be exempted from this requirement.<sup>1</sup>
3. **Non-European Cultures:** One course, other than a foreign language, which deals with non-European cultural traditions.<sup>2</sup> The course selected to satisfy this requirement may also be used as one of the courses used for the distributive requirement.
4. **Distributive Requirement:** Eight courses, selected from the five areas listed below. No more than two courses from the same department may be used to satisfy the distributive requirement. Courses which satisfy major and minor requirements may also be used to satisfy this requirement.

a. **Fine Arts:** One course in Art, Film, Music, or Theatre.

b. **Literature:** One course selected from a list of approved offerings in Classics, English, French,

<sup>1</sup>See page 10 for information concerning academic credit for Advanced Placement Testing.

<sup>2</sup>The following courses have been approved for this category for the 1988-89 academic year: Anthropology 21, 24, 28, 60, 160, 161, 162, 163, 165, 166, 170, 172, 175, 177, 179, 180, 185; Art 85, 185, 186, 187, 188; Geography 1, 51, 56, 58; History 1, 2, 31, 32, 33, 36, 37, 41, 105, 131, 132, 133, 134, 137, 230, 231; Philosophy 3, 121, 122, 221; Political Science 174, 175, 176, 178; Religion 20, 21, 131, 132, 141, 151.

German, General Literature, Greek, Latin, Russian, and Spanish.<sup>3</sup>

- c. **Humanities:** Two courses selected from a list of approved offerings in Classics, Greek, History, Latin, Philosophy, Political Science, and Religion.<sup>4</sup>
  - d. **Social Sciences:** Two courses selected from a list of approved offerings in Anthropology, Communication Science and Disorders, Economics, Geography, Political Science, Psychology, and Sociology. Area and International Studies 91A and 91B may also be used to satisfy this requirement.<sup>5</sup>
  - e. **Natural Sciences:** Two courses, one of which must include laboratory experience, from among the offerings in Biology, Botany, Chemistry, Geology, Physics, and Zoology.
- D. A student must complete an approved Major by satisfying the requirements specified by the department or program supervising the major (see pages 62-66), and by maintaining a cumulative grade-point average of 2.0 in the major field. No more than 45 hours of credit in the major field may be used toward completion of the 122 hours of credit required for graduation. At least one-half of the credit hours used toward the major requirements must be taken at the University of Vermont. Of these, at least 12 credits must be at or above the 100 level. Application of credits earned elsewhere to completion of the major is subject to approval by the appropriate department chairperson or program director. No courses applied toward satisfaction of major requirements may be taken on a pass/no pass basis.
- E. A student must complete an approved Minor in a field other than the major by satisfying the requirements specified by the department or program supervising the minor (see pages 66-68).<sup>6</sup> Also, a student must maintain a cumulative grade-point average of 2.0 in the minor field.<sup>7</sup> Completion of a second major will satisfy the minor requirement. As with the major, at least one-half of the credit hours used toward completion of the minor requirements must be taken at the University of Vermont, and application of credits earned elsewhere to completion of the minor is subject to approval by the appropriate department chairperson or program director. No courses applied toward satisfaction of the minor requirements may be taken on a pass/no pass basis.

<sup>3</sup>The following courses have been approved for this category for the 1988-89 academic year: Classics 42, 153, 155, 156; all English courses *except*: 1, 4, 30, 50, 53, 101, 102, 110, 172, 173, 177, 178, 179; all French courses numbered 155 or above *except* 201, 209, 210, 215, 216, 291, 292, 293; all German courses numbered above 100 *except*: 121, 122, 201, 221, 222, 232; all General Literature courses; all Greek courses numbered above 200; all Latin courses numbered above 100 *except* 111, 112, 255; all Russian courses numbered above 100 *except*: 103, 104, 203, 204, 271; all Spanish courses numbered 155 or above *except*: 201, 202, 210, 291, 293.

<sup>4</sup>The following courses have been approved for this category for the 1988-89 academic year: all History, Philosophy, Religion courses; Classics 154; Greek 203, 205; Latin 255; Political Science 31, 123, 124, 211, 212, 213, 216.

<sup>5</sup>The following courses have been approved for this category for the 1988-89 academic year: all Anthropology, Economics, Geography, Psychology, and Sociology courses; all Political Science courses *except*: 31, 123, 124, 211, 212, 213, 216; Area and International Studies 91A, 91B; Communication Science and Disorders 20, 80, 94.

<sup>6</sup>For students pursuing an interdisciplinary minor, the minor must include at least 15 hours of credit outside the student's major field. For students pursuing interdisciplinary majors, the minor must include at least 15 hours of credit in fields different from those of the courses comprising the major.

<sup>7</sup>The minor grade-point average will be calculated from the first set of courses which satisfy the minor requirements. However, in the case that a student's grade-point average in these courses falls below 2.0, and that there are additional courses which are approved for inclusion in the minor, a student may elect to drop for purposes of the grade-point average calculation, one course graded below 'C' and to replace this course with an approved alternate.

## REQUIREMENTS FOR THE BACHELOR OF SCIENCE DEGREE

- A. A student must earn a cumulative grade-point average of 2.0 in a program comprised of a minimum of 122 semester hours of academic credit. Of the 122 hours of credit, 96 hours must be taken in courses offered by departments and programs with approved majors in the College of Arts and Sciences and **two** hours must be associated with physical education activities. The remaining 24 hours of credit may be taken in courses offered by any academic unit of the University of Vermont, although no more than eight credits of Military Studies may apply toward the degree. Courses taken on a pass/no pass basis may *not* be used toward the completion of any requirement listed below under sections C and D.
- B. A student must be matriculated in the College of Arts and Sciences and in residence at the University of Vermont during the period in which he or she earns 30 of the last 45 hours of academic credit applied toward the degree.
- C. A student must complete the Distributive Requirement for the Bachelor of Science degree by completing six courses selected from at least two of the following areas: Foreign Language, Fine Arts, Literature, Humanities, and Social Sciences (see page 59 for a detailed description of the courses included in these areas). No courses applied toward satisfaction of the distributive requirements may be taken on a pass/no pass basis.
- D. A student must complete an approved Major by satisfying the requirements specified by the department or program supervising the major (see pages 62-66), and by maintaining a cumulative grade-point average of 2.0 in the major field. No more than 50 hours of credit in the major field may be used toward completion of the 122 hours of credit required for graduation. At least one-half of the credit hours used toward the major requirements must be taken at the University of Vermont. Of these, at least 12 credits must be at or above the 100 level. Application of credits earned elsewhere to completion of the major is subject to approval by the appropriate department chairperson or program director. No courses applied toward satisfaction of major requirements may be taken on a pass/no pass basis.

## REQUIREMENTS FOR THE BACHELOR OF MUSIC DEGREE

- A. A student must earn a cumulative grade-point average of 2.0 in a program consisting of a minimum of 122 semester hours of academic credit for a Music Theory Concentration, or 125 semester hours of academic credit for Music Performance Concentration. Of these hours of required credit, **two** hours must be associated with physical education activities. Courses taken on a pass/no pass basis may *not* be used toward the completion of any requirement listed below under sections C and D.
- B. A student must be matriculated in the College of Arts and Sciences and in residence at the University of Vermont during the period in which he or she earns 30 of the last 45 hours of academic credit applied toward the degree.
- C. A student must complete a Distributive Requirement which is identical to that required for the Bachelor of Arts degree (see pages 59 for a detailed description of the Distributive Requirement).
- D. A student must complete a Major with a concentration in either theory or performance by satisfying the requirements specified by the department (see pages 62-66), and

by maintaining a cumulative grade-point average of 2.0 in the major field. An admission audition, junior standing jury examination, and senior recital are also required for the performance concentration. At least one-half of the credit hours used toward the major requirements must be taken at the University of Vermont. Of these, at least 12 credits must be at or above the 100 level. Application of credits earned elsewhere to completion of the major is subject to approval by the appropriate department chairperson or program director. No courses applied toward satisfaction of major requirements may be taken on a pass/no pass basis.

## INTEGRATED HUMANITIES PROGRAM

The Integrated Humanities Program is a coordinated first-year program that presents the development of the Western cultural tradition through the perspectives of literature, history, and religion and philosophy. Most students in the program are housed in the Living/Learning Center. English 27, 28, History 27, 28, and Religion 27, 28 are the core courses for the program.

## REGULATIONS GOVERNING INDEPENDENT STUDY

A student may receive credit for a project or program of Independent Study which is supervised by an academic department or program within the University. Such independent study projects may be carried out under registration in courses entitled Readings and Research or Internship. All such projects must conform to University guidelines for independent study (see page 30). There is no limit on the number of independent study credits which may be earned, but prior approval by the Committee on Honors and Individual Studies is required if a student wishes to elect nine or more such credits in a single semester.

## REGULATIONS GOVERNING HONORS PROGRAMS

- A. The College Honors program, which is designed for the superior student with unusual initiative and intellectual curiosity, provides an opportunity for the pursuit of a two-semester, six-credit (3-3) independent research, scholarly, or creative project under the direction of a faculty sponsor. A student in the College of Arts and Sciences may apply for College Honors in a particular subject if, at the end of the junior year, he or she has a grade-point average of at least 3.20 and has been on the Dean's List for three semesters. The program must have been approved by the sponsoring department and by the Committee on Honors and Individual Studies before the end of the first week of the first semester of the candidate's senior year. Students must present a satisfactory written report and pass an oral examination upon completion of the honors project. Students who wish to consider undertaking a College Honors project during the junior year should contact the Office of the Dean for information concerning the circumstances in which such an exceptional arrangement is possible.
- B. Some departments in the College, including Economics, English, and Political Science, sponsor **Departmental Honors** programs. Participation in these programs is limited to those students who are specifically recommended by their department and who take a comprehensive examination. A student who successfully completes this comprehensive examination is granted a degree with Departmental Honors. These programs are administered directly by the sponsoring department and information concerning them may be obtained from faculty advisors.

## REGULATIONS GOVERNING STUDY ABROAD

Students should refer to page 41 for the general University regulations and procedures pertaining to Study Abroad. For Arts and Sciences students the following additional policies pertain to the application of credit earned in a Study Abroad program:

- A. Regardless of the number of credits accepted in transfer by the University, a maximum of 16 credits earned in a one-semester Study Abroad program will be applied toward satisfaction of degree requirements. For year-long programs, a maximum of 32 credits will be applied toward the degree.
- B. Students must complete 30 of the last 45 hours of degree credit in residence at the University of Vermont and must complete one-half of the hours applied toward the satisfaction of major requirements, including 12 hours at the 100 level or above, at the University of Vermont.
- C. Under no circumstances will a student in the College of Arts and Sciences be permitted to enroll in a University-sanctioned Study Abroad program while on trial.

## REGULATIONS GOVERNING TRANSFER INTO THE COLLEGE

A student who wishes to transfer to the College of Arts and Sciences from another college or school at the University ordinarily must have a cumulative grade-point average of 2.50 or better, must have completed two semesters as a degree candidate at the University, and must have taken the secondary school course work or subsequent college-level courses in those subjects required for admission to the University (see page 9). Consideration will also be given to those candidates for internal transfer whose cumulative grade-point averages fall within the range of 2.25 to 2.50. In these latter circumstances, a student must have: (1) a precollege record which satisfies the current admission standards for the College of Arts and Sciences; (2) demonstrated satisfactory performance in Arts and Sciences courses taken at the University; and (3) established a pattern of improving overall academic performance. Applications for internal transfer may be submitted to the Office of the Dean at any time, but they will be reviewed only at the end of each semester.

## REGULATIONS GOVERNING ACADEMIC STANDARDS

The following criteria for academic trial and dismissal, while making allowances for the student in the first semester, are designed to encourage academic work of quality at least equal to the minimum which is required for graduation.

- A. A student who earns a semester grade-point average higher than that which merits dismissal but below 2.00 (1.67 for first semester freshmen) is placed *on trial*. In order to avoid dismissal from the University, a student who has been placed *on trial* must earn a 2.00 semester average, enroll in all courses for a letter grade, and maintain a program of 12 or more credit hours during the following semester. A student who is *on trial* may not enroll in a University sanctioned study abroad program.
- B. A student who does not satisfy the conditions of trial, or who earns a semester grade-point average of 1.00 or lower, or who earns failing grades in one-half of the semester credit hours attempted (excluding courses in physical education and military studies) will be *dismissed for low scholarship*. The period of dismissal is one year. Until readmitted, a dismissed student may not enroll in any courses at



the University of Vermont, including those offered through the UVM Summer Session and Evening Division programs.

- C. A dismissed student who presents evidence of his/her ability to perform satisfactorily may be considered for readmission on trial. A student who has been dismissed for a second time will not be considered for readmission on trial until at least three years have elapsed. Further information regarding readmission may be obtained from the Office of the Dean.

## MAJORS: DEPARTMENT REQUIREMENTS

Bachelor of Arts, Bachelor of Science, and Bachelor of Music requirements are found under the appropriate department headings.

**INDIVIDUAL DESIGN MAJOR** The IDM is a nondepartmental, interdisciplinary major for those Bachelor of Arts candidates whose academic interests are not met by the major programs currently offered by the College. An IDM may not be a program of narrow professional training. Rather, it must lead to an intensive investigation of some broad area of human knowledge which is not covered by a single departmental discipline. During the senior year, IDM majors engage in a three-credit tutorial for which they complete a paper or an equivalent project which demonstrates the essential coherence of the major. A College Honors project (six credits) may be substituted for the tutorial requirement. Application to pursue an IDM must be approved by the Committee on Honors and Individual Studies before the beginning of the candidate's junior year. Additional information about the IDM program is available in the Office of the Dean.

**ANTHROPOLOGY** Thirty hours in Anthropology including 21, 24, 26, and 28; 225 and 228 (recommended for the junior year) and four additional advanced (100- or 200-level) courses of which only one may be an independent study and at least one must be at the 200 level.

**AREA AND INTERNATIONAL STUDIES** Entering students are invited to consider the option of concentrating in Area and International Studies. Courses in several academic disciplines can be combined so as to focus on a particular area of the world, thus providing an opportunity to test generalizations against the particular reality of a geographical area and its people.

Undergraduates who major in Area Studies usually accumulate sufficient credit to enable them also to fulfill department requirements in one of the social sciences, humanities, or foreign languages.

The four areas presently available for concentration are: CANADA, LATIN AMERICA, RUSSIA/EAST EUROPE, EUROPE (Western, Northern, Mediterranean). ASIAN concentration is currently available only for those students who can fulfill the language requirement in their special field (see below). Minor programs are also available in these areas, as well as in a concentration in Africa. For specific minor requirements, see page 67.

The approach to undergraduate education combines exposure to the traditional disciplines with integrative knowledge and appreciation of a foreign culture and thus combines the broad liberal arts education with a more specific area competence.

During their freshman and sophomore years, students who plan to major in Area Studies should take the required foreign language courses as well as beginning courses in the humanities and social sciences which are prerequisites for subsequent required courses and also meet the general distribution requirements.

Students interested in concentrating in Area Studies are urged

to contact the Director, Area and International Studies, 219 Old Mill, 656-1096.

Specific requirements of the individual programs follow:

### *Asian Studies*

- A. In selecting courses from the Asian Studies listing, students must consult with an appropriate Asian Studies advisor and demonstrate in their choices thematic and/or geographic coherence. Such courses must also accord with the following requirements:
- B. The requirements for the major are 36 credit hours of courses including:
1. Two courses (one at/above 100 level) in each of the following three academic areas (six courses, 18 credit hours in all):
    - a. History
    - b. Social Analysis (i.e. Political Science, Economics, Anthropology, Sociology, Geography)
    - c. Philosophy/Art/Religion
  2. Twelve credit hours (four three-credit courses or three four-credit courses) of a language of the geographical subarea of concentration, or otherwise important for the focus of concentration. Note: Offerings of Asian language are limited at the University and majors may have to fulfill this requirement through study elsewhere. Determination of credit equivalents for language competence not acquired through formal course work will be made by appropriate faculty members.
  3. One advanced course (three credits) in either:
    - a. A disciplinary theory or method course at the 200 level (such as Anthropology 210 or Religion 201), or
    - b. Readings and Research 197, 198 in which a research paper is produced.
  4. One other course from the Asian Studies listing below:

#### *East and Southeast Asia*

Anthropology 163; Art 186, 187; Geography 58; History 31, 32, 131, 132; Philosophy 3, 121, 122, 221; Political Science 175, 176; Religion 21, 132, 141, 145.

#### *South and West Asia*

Anthropology 165, 166, 170; Art 186; History 35, 36, 105; Political Science 178; Religion 21, 114, 116, 131, 132, 168, 196.

### *Canadian Studies*

- A. Eighteen hours representing at least four different disciplines selected from the courses of 100 percent Canadian content.
- Area and International Studies 91; 197, 198; 295, 296; Anthropology 167, Art 95; Business Administration 134; English 135, 136; French 285, 286; 293; Geography 52, 210; Geology 272 (when this field course goes to Canada); History 75, 76; 175, 176, 284, 285; Political Science 173; Social Work 200; Sociology 167.
- B. French language through the intermediate level.
- C. An additional two courses (six hours) from the above list and/or courses listed below.
1. Those in which 25 percent or more content on Canada is a regular part of the course and assignments.
 

Anthropology 28, 168, 178; Geography 146 (when taught by Meeks), 196; Geology 241 (when taught by Mehrtens), 273; History 173 (when taught by Stoler); Political Science 71, 273, 296 (when taught by Mahler); Psychology 237; Sociology 29 (when taught by Berkowitz).

2. Those in which a term paper, worth 25 percent or more of the grade, can be written on Canada. It is the student's responsibility to check this with the professor and the advisor.

Anthropology 160; Art 175, 176; Economics 150, 185; Education (EDFS) 206; English 13, 42 (when taught by Thompson); Geography 62, 173, 174, 175, 177, 270; History 126, 127; 174, 181; Linguistics 101; Political Science 177, 235, 250, 252, 256; Sociology 204, 207, 254, 255.

- D. An additional four courses (12 hours) from a related field chosen in conjunction with advisor. For those choosing a double major, the second major provides this related field.

**Latin American Studies**

- A. Twelve hours as follows:

Anthropology 161	History 33
Geography 56	Political Science 174

Two additional semester courses selected from Area and International Studies, 193, 194; 195, 196, 197, 198; or 297, 298; Economics 255; History 133, 134; or from courses recommended by the Program of Latin American Studies.

- B. Plus six hours of advanced Spanish (Spanish 185, 186, 281, 285, 286, 293).

- C. An additional 12 hours from related courses chosen in consultation with advisor.

**Russian/East European Studies**

Required Courses:	Hours
Russian 52, and two courses at the advanced level	10
History 54, and 154	6
Geography 53	3
Economics 11, 12; and 185 or 281	9
Political Science: three hours and 172	6

Three additional courses from the following list:

Economics 185, 277, 281	
History/Political Science 277, 278	
Political Science 212	
General Literature 181, 182	9
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- B. Recommended Courses:  
Area and Int'l Studies 91

The program also offers an interdisciplinary individual design major in Russian/East European Studies and Economics. The program of study must be set up with a member of the Russian/East European Studies faculty.

Required courses:	Hours
Two courses in Russian or another Slavic language at the intermediate level. Example: Russian 11, 12	8
Four courses in Economics including 185, 277, 281	12
Two Russian/East European Area Studies courses other than those in Economics	6
Two courses in Business Administration	6
Two approved electives at the 100 level or above	6
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**European Studies (Northern, Western, Mediterranean)**

- A. At least 18 hours of upper-level courses in one European Area or topic (e.g. Medieval and Renaissance Studies or Irish Studies) determined through consultation with an advisor and approval of the European Studies subcommittee of the Area and International Studies Program.
- B. Fifteen hours of additional upper-level courses related to Europe.

The total of 1 and 2 shall include nine hours of advanced

courses in European Literature and Fine Arts and nine hours of advanced courses in Social Science relating to Europe.

- C. Six hours of a European foreign language related to the area or topic of 1 and at the 200 level. Those who have concentrated on a foreign language in 1 shall offer six hours of a second foreign language at the 100 level or above in addition to the requirements of 2.

Variants in the language requirement may be made by the advisor, depending upon the area of interest (e.g. Ancient/Medieval History or Archaeology, where an ancient and a modern language would be required).

**ART** Students may major in one of the following:

**Studio Art:** Thirty hours in studio, including 1, 2, and 3 with three different instructors; five courses at the 100 level (only one of which may be 197; only one of which may be 195) with two different instructors, including courses in the areas of two-dimensional study (drawing, painting, printmaking, photography, and video) and of three-dimensional study (sculpture, ceramics, visual environment, fine metals, and performance); and two different courses at the 200 level, one of them in the senior year; nine hours of Art History, including 5, 6, and one of the following: 172, 176, 179, or 181.

**Art History:** Thirty hours in Art History, including 5, 6; four 100-level courses, one each in four of the following five categories (196 courses in these categories also qualify): Medieval (150, 153, 154), Renaissance (158, 161, 164), Baroque (167, 168, 171), Modern/American (172, 175, 176, 179, 181, 184), Asian (186, 187, 188); two additional Art History courses; two seminars at the 201 level or above, one of the latter in the senior year; six hours of Studio Art — three hours chosen from 1, 2, 3, and three hours at the 100 level; intermediate level French or German (or other foreign language by advisor's permission if related to the area of emphasis).

*Note:* A Studio Art major may take not more than one Evening Division course per semester in Studio Art.

**BIOLOGY** Students may select either of two degree programs:

**Bachelor of Arts:** Chemistry 1, 2 or 11, 12, 13, 14, to be taken the freshman year if possible; Physics 21, 22 in combination with 11, 12 or preferably 31, 42; Math. 19, 20, or 21. Thirty-six hours including Biology 1, 2, 101, 102, 103, Zoology 104, Botany 108; and three advanced courses, not all in the same department, selected in consultation with the advisor from among the approved offerings of the several biologically-oriented departments. For a detailed list of these courses, please consult the Zoology Department office.

**Bachelor of Science:** Chemistry 1, 2 or 11, 12, 13, 14, to be taken the freshman year if possible; Chemistry 141, 142; Physics 21, 31, and 22, 42; Math. 19, 20 or 21, 22; Statistics 141 or 211. Forty-six hours including Biology 1, 2, 101, 102, 103, Botany 108, and Zoology 104. The remaining credits should be chosen from more than one department and selected in consultation with the advisor from among the 100- and 200-level Biology and Zoology courses, Botany 104, 107, 109, and the 200-level Botany courses, and approved advanced offerings of the several other biologically-oriented departments. Three hours of Zoology undergraduate research or honors may be counted toward the total of the 46 required credits.

**BOTANY** Math. 21, 22; or Math. 21 and Statistics 141 or 211; or Math. 19, 20 and Statistics 141 or 211; Physics 21, 22; and 11, 12 or preferably 31, 42; Chemistry 42 or preferably 141, 142; Biology 1, 2; Botany 101 or 132, 104, 107, 108, and 109 or 160; two additional semester courses in Botany, at least one at the 200 level. Six credits of modern foreign language are strongly recommended. Students may petition the department to substitute other courses for certain requirements in the planning of individual programs.

**CHEMISTRY** Students may select either of two degree programs:

**Bachelor of Arts:** Chemistry 11, 12, 13, 14 (or 1, 2, 121 or 1, 12, 14), 141 or 143, 144, 145, 146, 162, 163, 201, 202, 221, and 231; Math. 21, 22, 121 (or equivalent); Physics 21, 31 and 22, 42 (or 125).

**Bachelor of Science:** Chemistry 11, 12, 13, 14 (or 1, 2, 121 or 1, 12, 14), 141 or 143, 144, 145, 146, 162, 163, 201, 202, 221, 231, 232, 282; nine hours of advanced chemistry or biochemistry electives, which may include Chemistry 291; Physics 21, 31 and 22, 42 (or 125); Math. 21, 22, 121, 271 (or equivalent); proficiency in German equivalent to the completion of German 1, 2 or 21, 22.

**CLASSICS** Students may major in:

**Latin:** Thirty hours in courses above 100, among which 111, 112 and History 107 are required and one course in literature in translation above 100 and one course in Greek above 100 are applicable; a second foreign language (either six hours of Greek at least through 52 or six hours of a modern European language of which at least three hours are at the 100 level or above).

**Greek:** Thirty hours in courses above 50, among which 111, 112 and History 106 are required and one course in literature in translation above 100 and one course in Latin above 100 are applicable; a second foreign language (either six hours of Latin at least through 52 or six hours of a modern European language of which at least three hours are at the 100 level or above).

**Classical Civilization:** Forty-two hours consisting of 30 in the major discipline and 12 hours at the 100 level or above in related courses. *Major Discipline:* Courses in Latin, Greek, classics, ancient history, and ancient art are applicable, among which three hours in Ancient History (9, 105, 106, 107) and the following language study are required: six hours of Latin or Greek at the 200 level *OR* six hours of Latin at the 100 level and six hours of Greek above 50; *OR* three hours of Latin or Greek at the 200 level and three hours of a modern foreign language at the 100 level. (The three hours of the modern foreign language are not to be counted as part of the major discipline but as a related course.) Strongly recommended as part of the major discipline are Classics 42 (Mythology), Art 51 (Greek Art), Classics 153, 154, 155, 156 (Greek and Latin Literature in Translation). Classics 22 (Etymology) is applicable, but not together with Classics 42. Also recommended are History 106 and 107. *Related Courses:* Students should consult with the Classics Department in choosing related courses. Courses at the 100 level or above in one or more of the following are applicable: anthropology, art, English, economics, geography, history, modern foreign languages, music, philosophy, political science, religion, sociology, and theatre. Strongly recommended are courses in literature, medieval history, ancient philosophy, medieval, renaissance, and baroque art.

**COMMUNICATION SCIENCE AND DISORDERS** Thirty-two hours in Communication Science and Disorders including 80, 90, 94, 101, 105, 251, 261, 262, 271; Computer Science 3 or 11, Psychology 161, Statistics 111 or 141.

**ECONOMICS** Thirty hours in Economics including 11, 12, 101, 102, three courses at the 100 level, and three courses at or above the 200 level; Statistics 141. Additional courses in other social sciences are strongly recommended. Note that Statistics 141 has a prerequisite of Math. 19.

**ENGLISH** Thirty hours including 81 and 82; at least 21 hours at the 100 level (three hours of which may be in General Literature) and three hours numbered 201-262. Of the 24 total hours above 100, 12 must be in courses in English literature prior to 1900 and/or study of the language (101-129, 171, 202-222) or in General Literature prior to 1900. No more than six hours of English 177, 178 (Advanced Writing), and/or 179 (Writer's Workshop) will count toward fulfillment of major requirements.

**ENVIRONMENTAL STUDIES** Thirty-two hours in Environmental Studies, including 1, 2, 100, 151, 201, 204, and six other hours of 202 and/or 203, plus six hours at or above the 100 level (not to include 191, 202, or 203).

**GEOGRAPHY** Thirty hours in Geography including 81, six hours in courses numbered 51 to 61, nine hours at the 100 level, and six hours at the 200 level.

**GEOLOGY** Students may select either of two degree programs:

**Bachelor of Arts:** Thirty hours of Geology, including 1, 101, 110, 131, and three courses at the 200 level. Math. 21 or Math. 19 and 20, plus nine additional hours of approved science, mathematics, or engineering. Field experience (Geology 201, or equivalent) strongly recommended.

**Bachelor of Science:** Students selecting this degree program are encouraged to develop a strong minor field of specialization in one of the ancillary science or engineering programs.

Geology Requirements:

Geology 1, 101, 110, 121, 131, 153, 201\*, 230, 260, plus three additional courses in Geology, two of which must be at the 200 level.\*\*

Ancillary Science Requirements:

Chemistry 1 and 2 (or 11/13 and 12/14), Physics 21, 31 and 22, 42 (or 21, 31, and 125), Math. 21 and 22 (or 19, 20, and 22), Computer Science 11, Statistics 141, plus one approved science, engineering, or mathematics course.

\*201 can also be taken as an independent field project or transfer credit from an accredited field program.

\*\*One additional approved science, engineering, or mathematics course may be substituted.

**GERMAN** Thirty hours numbered above 100 including 101, 102; 281, 282; two semester courses of English or general literature; two semester courses of European history.

**HISTORY** Thirty hours in History including History 5 and 6 or 27,28, at least three courses at the advanced intermediate (100) level, and at least one course at the seminar (200) level. Within the major, students must select an 18-hour area concentration, including at least one advanced intermediate course and a seminar. Concentration areas designated by the department include: (1) Ancient/Medieval/Renaissance/Reformation; (2) Modern Europe (Renaissance to Present); (3) United States/Western Hemisphere; (4) Third World/East Asia; (5) History of Ideas/Methodologies. Students may design other concentrations, to meet individual interests, with the advice and consent of their advisors and the department. The balance of the departmental major requirement (12 hours) should be fulfilled through courses *outside* the concentration area.

**MATHEMATICS** Thirty-six semester hours of courses numbered 21 or higher (including 102 or 104, 124, 241 or 251, and at least 12 additional hours in mathematics or statistics courses numbered 200 or above), plus Computer Science 11. Students interested in specializing in statistics must have Statistics 241 instead of Math. 241 or 251 and should contact the Statistics Program.

**MUSIC** Students must take a placement audition upon entering the Bachelor of Arts and Bachelor of Music programs. Thereafter they may elect either of two degree programs:

**Bachelor of Arts:** Forty hours in Music. Majors will take the following core courses: 11, 12 (history); 31, 32, 131, 132 (theory); and 133, 134 (theory lab); plus eight hours of performance study and ensemble in any combination.

Music majors must attain intermediate level on a single instrument.

All students will elect nine additional hours — at least three at the 200 level — in one of the following three categories, plus three hours in a category different from that of the chief concentration.

(a) Theory:	231-235
(b) History:	111-114, 211-214
(c) Performance:	251-254, 256

A mixture of categories may be possible in consultation with a departmental advisor.

Concentration in category "c" requires appearance at least once a semester in departmental noon-time recitals, and a solo recital in the second semester of the senior year.

Majors must have, or acquire, piano skills sufficient to pass the functional piano exam, in addition to the eight hours of performance and ensemble study.

One foreign language through the intermediate level is required of all students.

**Bachelor of Music:** This degree, with a concentration in performance or theory, is the initial preprofessional collegiate music degree, designed for highly talented students who wish to pursue a career in music as performers, scholars, or private teachers. To earn the degree, they must demonstrate not only technical competence but also a broad knowledge of music and musical literature, sensitivity to musical style, and an insight into the role of music in society. Candidates with a strong sense of commitment ordinarily continue their studies through postgraduate work before they are fully qualified as professionals. Admission to the Performance major requires an audition with the Music Department. In the second semester of the sophomore year, all majors except those in Theory, are required to pass a junior-standing examination by faculty jury to determine whether they will be permitted to continue as majors. Students transferring into the music major programs that require a senior recital will be expected to pass the junior standing jury before junior status can be achieved. The final graduation requirement is a senior recital. All students approaching a senior recital must pass a faculty audition covering all of the music to be included on the recital six weeks prior to the date of the recital. Admission to the Theory major requires successful completion of a comprehensive theory examination at the end of the sophomore year. Transfer students with advanced standing must also pass this examination before they can be accepted as Theory majors. The curriculum consists of the following courses:

Performance Major	Hours
(a) Major instrument, 151, 152, 153, 154, 251, 252, 253, 256	28
(b) Theory, 31, 32, 131, 132, 133, 134, 231, 232, 233, 259	26
(c) History, 11, 12	6
(d) Ensemble	14
(e) Keyboard, 5, 6, 7, 8 (if necessary)	4
(f) Music electives	9
(g) Nonmusic electives	36
(h) Physical education	2
	<hr/> 125

Theory Major	Hours
(a) Major instrument, 151, 152, 153, 154, 251, 252, 253, 254	12
(b) Theory, 31, 32, 131, 132, 133, 134, 231, 232, 233, 234, 235, 237, 238, 240, 241, 259	43
(c) History, 11, 12	6
(d) Ensemble	6
(e) Keyboard, 5, 6, 7, 8	4
(f) Instrumental choirs	4
(g) Music genre electives	9
(h) Nonmusic electives	36
(i) Physical education	2
	<hr/> 122

**PHILOSOPHY** Thirty hours including: (a) 13 or 113; (b) 101 and 102; (c) at least two of 201 or 202 or 240; (d) at least one of 4, 140, 142, 143, 144, or 152; and (e) a total of at least four 200-level courses in Philosophy. Students considering graduate work are urged to study a foreign language.

**PHYSICS** Students may select either of two degree programs:

**Bachelor of Arts:** Thirty hours in physics, including 31 with 21, 42 with 22 (or 125), 128, 201 or 202, 211 and 213; mathematics through 121. An additional laboratory science and computer science are strongly recommended.

**Bachelor of Science:** Physics 31 with 21, 125 (or 42 with 22), 128, 201, 202, 211, 213, 214, 265 (or equivalent), 273, 12 hours of approved physics electives; Math. 21, 22, 121, and six hours of approved mathematics electives; eight hours of chemistry, exclusive of Chemistry 3, 4 or 7; by midway in the junior year, a student must demonstrate proficiency in computer programming equivalent to completion of Computer Science 11.

**POLITICAL SCIENCE** Thirty hours in political science, including: (a) four (12 hours) of the five core courses (21, 31, 51, 71, 81); (b) fifteen hours at the advanced level, nine hours of which must be at the 200 level, subject to the following restrictions:

1. Students must complete at least one advanced (100 or 200) course in three different subfields.
2. Students must complete at least 12 hours, including six hours at the 200 level, in regular UVM courses—not internship, not study abroad, not transfer.

**PSYCHOLOGY** Thirty-five hours including: (1) 1, 109, 110, 119; (2) three of the following: 121, 130, 152, 161; (3) one course from each of the following categories A, B, and C:

- A. 205, 206, 220, 221, 222, 223, 264
- B. 230, 231, 233, 234, 236, 237, 261, 262, 264, 266
- C. 250, 251, 253, 254, 255

(4) one additional course at/above 100 level.

**RELIGION** Thirty-six hours in Religion,\* including 100 and 201; one course chosen from the 101-109 range (comparative); one course from the 110-129 range (Judeo-Christian traditions); one course from the 130-149 range (Asian traditions); one course from the 140-159 range (cultures); additional course at the 200 level. *Note:* Courses in the 140-149 range will satisfy either the Asian traditions or the cultural requirement.

\*Up to six hours in related courses may be substituted. A list of approved courses is available from the Religion Department.

**ROMANCE LANGUAGES** Students may major in French or Spanish.

**French:** A minimum of 33 hours of courses numbered above 100, of which at least 12 hours must be in literature and at least 18 in courses numbered above 200. Required courses: 155, 156 and two of the following: History 53, French 291, French 292. (History 53 will not count in the 33 required hours.)

**Spanish:** A minimum of 33 hours of courses numbered above 100, of which at least 12 must be in literature and at least 18 in courses numbered above 200. Required courses: 155, either 185 or 186, and either History 33 or History 158. (History 33 will not count in the 33 required hours. History 158 will count, since it is taught in Spanish.)

**RUSSIAN** Thirty hours at the 100 level or above to be chosen in consultation with a faculty member teaching in the Russian curriculum, two semester courses of English or general literature, plus two semester courses from the Russian and East European Area Studies program (chosen in consultation with major advisor).

**SOCIOLOGY** 1, 100, normally taken by the end of the sophomore year; 278, normally taken by the end of the junior year; and 24 additional credit hours in Sociology, of which a minimum of 18 credit hours must be at the 200 level. At least one

course must be taken from each of the categories A and B as follows:

- A. 208, 209, 225, 232, 237
- B. 274, 275

At least three credit hours must be taken from each of three of the following categories:

- C. 204, 205, 206
- D. 214, 216, 217, 255, 258
- E. 211, 219, 229, 240, 242, 243, 254
- F. 207, 228, 285, 286, 288, 289

And a minimum of six hours in the related fields of anthropology, economics, geography, history, political science, or psychology.

**THEATRE** Thirty-three hours of Theatre courses, including 1, 5, 10, 15, 40; 115 or 140; 135, 136, 137, 138; 250; plus nine hours of related courses, six of which are numbered 100 and above. A summer's participation in the Champlain Shakespeare Festival or comparable company strongly recommended.

**ZOOLOGY** Students may select either of two degree programs:

**Bachelor of Arts:** Chemistry 1, 2 or 11, 12, 13, 14 to be taken the freshman year if possible; Math. 19, 20 or 21; Physics 21, 22 in combination with 11, 12 or preferably 31, 42. Thirty hours of Biology and Zoology including Biology 1, 2, 101, 102, 103, Zoology 104, plus seven hours chosen from Biology 203, 205, and 200-level Zoology courses.

**Bachelor of Science:** Chemistry 1, 2 or 11, 12, 13, 14 to be taken the freshman year if possible; Chemistry 141, 142; Physics 21 with 31 and 22 with 42; Mathematics 19, 20 or 21, 22; Statistics 141 or 211. Forty-three hours of Biology and Zoology courses including Biology 1, 2, 101, 102, 103, and Zoology 104. The remaining credits may be chosen from Biology 203, 205, and 200-level Zoology courses. Three hours of Zoology undergraduate research or honors may be counted toward the total of the 43 required credits.

## MINOR REQUIREMENTS

The following minors are an integral part of the Bachelor of Arts program and, as such, will not be certified for students in other degree programs.

### ANTHROPOLOGY

**Social Anthropology:** 21; two 100-level topical courses plus one 100-level "peoples" course, or one topical and two "peoples" courses; and one course from 225, 228, 283, or 290.

**Archaeology:** 24; two from the following: 160, 161, History 105; 200 or the equivalent; 210.

**AREA AND INTERNATIONAL STUDIES** See page 67.

### ART

**Studio Art:** Eighteen hours, including six hours of introductory level of which at least three hours must be in 1, 2, or 3. Nine hours at the 100 level including three hours from two-dimensional studies and three hours from three-dimensional studies. One 200-level course.

**Art History:** Eighteen hours, including 5 and 6; nine hours of 100-level courses with at least two different instructors; and one 200-level seminar.

### BIOLOGY

- A. Biology 1, 2
- B. One of the following: Biology 101, 102, 103, Zoology 104, Botany 108.
- C. Two additional courses in two different departments chosen from (2) above, 200-level Botany, or 200-level Zoology; other biologically-oriented courses only by approval of the Zoology Department.

**BOTANY** Botany 4; any three from the following: 104, 107, 108, 109, 117, 132, 160.

### CHEMISTRY

A. Chemistry 1, 2\*

B. *One of the two* following sequences:

1. Chemistry 141, 142+ and one of the following: 121++, 160, 162, 163
2. Chemistry 162, 163 and one of the following: 42, 141, 121++

\*11, 12, 13, 14 can be used in place of Chemistry 1, 2.

+143, 144 can be used in place of 141, 142. Students enrolled in 143, 144 may waive the requirements of concurrent enrollment in 145-146.

++Not available for credit for students taking 11, 12, 13, 14.

### CLASSICS

**Latin Language and Literature:** Fifteen hours of Latin at 51 or above, to which three hours from the following are applicable: History 107; Classics 153, 154, 155, 156.

**Greek Language and Literature:** Fifteen hours of Greek at 51 or above, to which three hours from the following are applicable: History 106; Classics 153, 154, 155, 156.

**Classical Civilization:** Eighteen hours, including six hours of Greek or six hours of Latin at the level of 5 or above, and 12 hours from the following (of which at least nine hours must be above 100): History 9, 106, 107; Classics 42, 153, 154, 155, 156; Art 51.

**COMMUNICATION SCIENCE AND DISORDERS** 80; 90; 94; 101; 103.

### ECONOMICS

A. Economics 11 and 12.

B. Economics 101 or 102.

C. Two additional 100-level Economics courses numbered 111-196.

### ENGLISH

A. **American Literature:** 23 or 24 or 82, plus four of these courses: 135, 136, 140-159. May elect an additional three credits in a seminar: 241, 242, 251, 252.

B. **British Literature: The Modern Tradition:** 22 or 82, plus four of these courses: 124-140. May elect an additional three credits in a seminar: 221, 222, 231, 232.

C. **British Literature: The Early Tradition:** 21 or 81, plus four of these courses: 111-123. May elect an additional three credits in a seminar: 211, 212, 221, 222.

**ENVIRONMENTAL STUDIES** Seventeen hours in Environmental Studies consisting of 1, 2, 100, 204, and three additional credits at the 100 level or above.

### GEOGRAPHY

**Human Geography:** Fifteen hours including one course from Geography 1, 3, and 16; one course from those numbered 51 to 74; and three courses from Geography 155, 170, 171, 173, 174, 175, 177, 179, 183, 201, 233, 261, 270, 287.

**Physical Geography:** Fifteen hours including Geography 2 or 43; one course from those numbered 51 to 61; and three courses from Geography 142, 143, 146, 201, 216, 242, 261, and 285.

**GEOLOGY** 1, 101; 110; plus six additional hours at the 100 level or above.

### GERMAN AND RUSSIAN

**German:** Five courses at the 100 or 200 level, one of which must be 101 or 102.

**Russian:** Russian 51, 52; three courses at the 100 or 200 level.

**HISTORY** Fifteen hours in History, nine of which must be at or above the 100 level.

### MATHEMATICS

**Pure Mathematics:** 21, 22, 121, 102, 124, and either 241 or 251.

**Applied Mathematics:** 21, 22, 121, 124, 230, and one of 237, 240, 264, or 272.

**MUSIC** Twenty hours including six in Music History (11, 12), six in Basic Musicianship (31, 32), two in Performance Study

(151, 152) or Ensemble (161-166, 171-179) in any combination, plus six in History, Theory, or Performance/Ensemble at the 100 level or above.

**PHILOSOPHY** One course from 1, 3, or 4; 101, 102, or 102, 112, or 101, 140, or 107, 160. At least one course from 201, 202, 240, and six additional hours at the intermediate level or above. (Except with departmental permission, courses numbered 180-199 and 280-299 will not count toward fulfillment of the minor.)

**PHYSICS** Eighteen hours including 21, 31, 125 (or 21, 31 and 22, 42); 128; three additional hours in Physics courses numbered 100 or above excluding 193-198; and three hours numbered above 200. No more than three hours in Physics 201 or 202 will count. *Note:* Mathematics through 121 is needed for Physics 128.

**POLITICAL SCIENCE** Eighteen hours in political science, including three from the "core" courses (21, 31, 51, 71, 81), and three courses at the level of 100 or above, one of which must be at the 200 level.

**PSYCHOLOGY** Eighteen hours including 1, 101 (or 109 and 110), plus 12 hours at the 100 level or above, including at least three hours at the 200 level.

**RELIGION** Eighteen hours in Religion including: one introductory course (from 20, 21, 22, 23); 100; one course from 101-109 range; one intermediate level course on a particular religious tradition (from 110-149); one course at the 200 level; an additional Religion course.

#### ROMANCE LANGUAGES

**French:** Eighteen hours in French above 100, including six hours of language courses, chosen from 101, 102, 201, of which at least three hours must be at the 200 level; six hours of literature courses; and six additional hours in courses numbered above 201.

**Spanish:** Eighteen hours in Spanish above 100, including six hours of language courses, chosen from 101, 102, 201, 202, of which at least three hours must be at the 200 level; six hours of literature courses; and six additional hours in courses numbered above 202.

**SOCIOLOGY** Eighteen hours in Sociology, including: 100, 278, and at least three additional hours at the 200 level. Courses used to meet the minor requirement should constitute a coherent program and will be selected in consultation with the student's minor advisor.

#### STATISTICS

A. The student must have a minor advisor from the Statistics Program.

B. Students are required to complete 15 credits of courses offered by the Statistics Program and one course in calculus. The statistics courses are selected in consultation with the student's minor advisor to represent a cohesive set of courses usually related to the student's background in mathematics and computer science. Specific requirements are as follows:

1. One course in calculus, e.g. 19, 20, 21, or 22, is required.
2. Three credits of introductory methods. 141 or 211 is recommended.
3. Three credits in courses in probability. 151 or 251 is recommended; 51 is acceptable for students who have not had two semesters of calculus.
4. Nine credits of other statistics courses. For students who have taken a calculus-based probability course, statistical inference (241) or theory (261/262) is recommended. The nine hours may include independent project work such as Statistics Practicum (281) or Special Projects (191).

C. Experience in computing through relevant course work is required. This may be satisfied through computer experience gained in Statistics 201 (Statistical Analysis via Com-

puter) or other courses approved by the minor advisor.

**THEATRE** 1; 5 or 10; 15 or 40; 135; one chosen from 136, 137, 138; 250.

**ZOOLOGY** Biology 1 and 2; three courses at the level of 100 or above, chosen from courses acceptable for the Zoology major, at least one of which must include a laboratory.

#### INTERDISCIPLINARY MINORS

##### AREA AND INTERNATIONAL STUDIES

**African Studies:** A total of 18 credit hours (six courses), at least nine of which must be at the 100 level or above, and which must include the following:

- A. Anthropology 162  
Geography 51  
History 37
- B. Two courses chosen from among the following:  
Agr. and Resource Economics 2, 272  
\*Anthropology 170, 177, 179, 283  
\*Economics 255, 256  
\*Education (EDFS) 206  
French 289  
\*Geography 177  
History 137

or appropriate Special Topics or seminar courses, chosen in consultation with the African Studies Program advisor.

\*Students may count these courses towards fulfillment of the minor requirements only if individual projects, relevant to the African area, have been arranged in consultation with the African studies advisor.

C. Area and International Studies 197 (Readings and Research on an African Topic under the direction of participating faculty members — to be arranged in consultation with the African Studies Advisor) or Area and International Studies 195 (Special Topics Seminars, taught by participating faculty members).

##### Asian Studies:

- A. In selecting courses from the Asian Studies listing on page 62, students must consult with an appropriate Asian Studies advisor and demonstrate in their choices thematic and/or geographic coherence. Such courses must also accord with the following requirements:
- B. Eighteen credit hours (six courses) are to be chosen, to include two courses (one at/above 100 level) in each of the following academic areas:
  1. History
  2. Social Analysis (i.e. Political Science, Economics, Anthropology, Sociology, Geography)
  3. Philosophy/Art/Religion

**Canadian Studies:** Five courses (15 hours), representing at least three disciplines, chosen from among courses with exclusively Canadian content. At least nine hours must be at the 100 level or above. Currently available:

- Area and International Studies 91  
Anthropology 167  
Art 95  
Business Administration 134  
English 135, 136  
French 285, 286, 293  
Geography 52, 210, 272 (when this course goes to Canada)  
History 75, 76, 175, 176, 284, 285  
Political Science 173  
Social Work 200  
Sociology 167

##### Latin American Studies:

- A. Students who are not Spanish majors: 18 hours (six courses)
  1. Completion of Spanish 52 or above (three hours).
  2. Completion of five of the following courses: Anthro-  
pology 161, Economics 255, History 33, History 133 or



History 134, Geography 56, Political Science 174, Spanish 185, 186, Area Studies 195 or 196.

**B. Students who are Spanish majors: 18 hours (six courses)**

1. Completion of one of the following three courses: Spanish 285, 286, 293.
2. Completion of five of the following courses: Anthropology 161, Economics 255, History 33, History 133 or History 134, Geography 56, Political Science 174, Area Studies 195 or 196.

**Russian/East European Studies:** Twenty hours to include Russian 11, 12 or its equivalent, and four courses from the following:

- History 54, 154
- Political Science 172
- History/Political Science 278 (cross-listed course)
- Economics 185, 277, 290
- Geography 53
- General Literature 181, 182

**FILM STUDIES** Eighteen hours, including Art 14; Film 5 or 6; six credits from Film courses at the 100 level; three credits from English 171, Theatre 135; three credits from Film courses at the 200 level.

**SPEECH** Eighteen hours to include 12 hours from Speech 11, 111, 112, 283-4 or Theatre 5; and six hours from Speech 214 or 283-4, or Sociology 9 or 141.

**WOMEN'S STUDIES** Courses used to meet the requirements of this minor should constitute a coherent program and will be selected in consultation with a Women's Studies Minor advisor. Students should be aware that they can take a maximum of nine credits in one discipline for the minor.

A. Required core courses: English 42, History 72.

B. Area courses: Six credits chosen from Psychology 162, Anthropology 172, Sociology 122. With the approval of the Women's Studies Committee, students may elect other 100-level courses on women, when offered.

C. Required advanced/concentrated work: Psychology 231. With the approval of the Women's Studies Committee, students may elect other 200-level courses on women, when offered.

D. Women and social context: Three additional credits. At least one course subject to Women's Studies Committee approval. A list of courses which currently fit this category is available from the Women's Studies Committee or the Dean's Office.

## PREPROFESSIONAL PREPARATION

Students who plan to enter professional colleges requiring previous collegiate preparation will find the variety of courses offered in the College of Arts and Sciences and the freedom of election in that College is such that all the requirements for any professional school may be met. Many students will desire to direct their four-year undergraduate courses to provide, in addition to a sound general education, appropriate preprofessional training for later work in the medical sciences, law, or theology.

Special advising is available in the College for students preparing for careers in education, journalism, law, and medical sciences.

**BIOLOGY** A major in Biology is offered to students enrolled in the College of Arts and Sciences. It has been designed for the student who wishes to concentrate in Biology while pursuing a



liberal arts education. It will also serve as a basis for programs leading to graduate study in biological fields and as an appropriate major for students in premedical and pre dental programs. Majors may pursue either the B.A. or the B.S. degree. For specific requirements for these degrees, please see pages 59-60.

**JOURNALISM** Admission to schools of journalism is generally open to academically-qualified students who hold the Bachelor of Arts degree with concentration in any discipline. Interested students should take a broad program in the liberal arts, including work in the social sciences and in English.

**LAW** American law schools, as a rule, require graduation from a four-year college with a Bachelor's degree prior to admission. There is no prescribed curriculum for admission to law school, and candidates pursue their undergraduate studies in a wide range of majors. A Pre-Law Advisory Committee aids students in planning their academic programs and in making application to law schools. Members of the committee include: Prof. Holland, Department of Political Science; Prof. Stanfield, Department of Sociology; Prof. Haltom, Department of Political Science; Prof. Ashman, Department of Merchandising, Consumer Studies, and Design; Prof. Warhol, Department of English; Larry Simmons, Center for Career Development.

**THEOLOGY** Graduation from a four-year college is prerequisite for admission to most theological seminaries. Although no prescribed curriculum is demanded as preparation for such professional schools, the student is advised to elect substantially from the departments of languages (particularly classics), history, philosophy, religion, psychology, and sociology.

**OPTOMETRY** The requirements for admission to schools of optometry vary, but typically they include courses in English, mathematics, physics, chemistry, and zoology with a minimum of two years of college work.

**PHARMACY** Under the Regional Plan (page 11) Vermont residents may prepare for pharmacy school at Connecticut or Rhode Island. This is a five-year undergraduate program concentrating in pharmacy, which includes two years of preprofessional work in English, mathematics, botany, chemistry, zoology, physics, social science, and fine arts.

**MEDICINE AND DENTISTRY** The prevailing requirements for admission to an accredited medical college include a minimum of three years of undergraduate work but most institutions recommend four years. During their sophomore year, students desiring to enter medical school should consult catalogues of colleges to which they expect to apply and arrange to include in their program courses required by those schools. They should also keep informed of events and

deadlines relating to the application process by contacting the Office of Career Development.

Each student, in consultation with his/her advisor, plans a four-year program of courses which will fulfill the requirements for a Bachelor's degree. To meet the *minimum* requirements of most medical colleges, the program should include the following:

Mathematics, one of the following options:

Math. 21, 22 (recommended for able students)

Math. 19, 20 (adequate)

Math. 9, 2; 21 or 19, 20 (suggested for students not immediately prepared to enter calculus)

Chemistry, two years minimum, *with laboratory*

Chemistry 1, 2, or 11, 12, 13, 14 (recommended for potential Chemistry majors)

Chemistry 141, 142 (required)

Physics, one year minimum, *with laboratory*

Physics 21, 31 and 22, 42 (recommended for students with calculus background)

Physics 21, 31 and 125 (recommended for students concentrating in the physical sciences or engineering)

Physics 11, 21 and 12, 22 (acceptable for students without calculus background, or taking calculus concurrently)

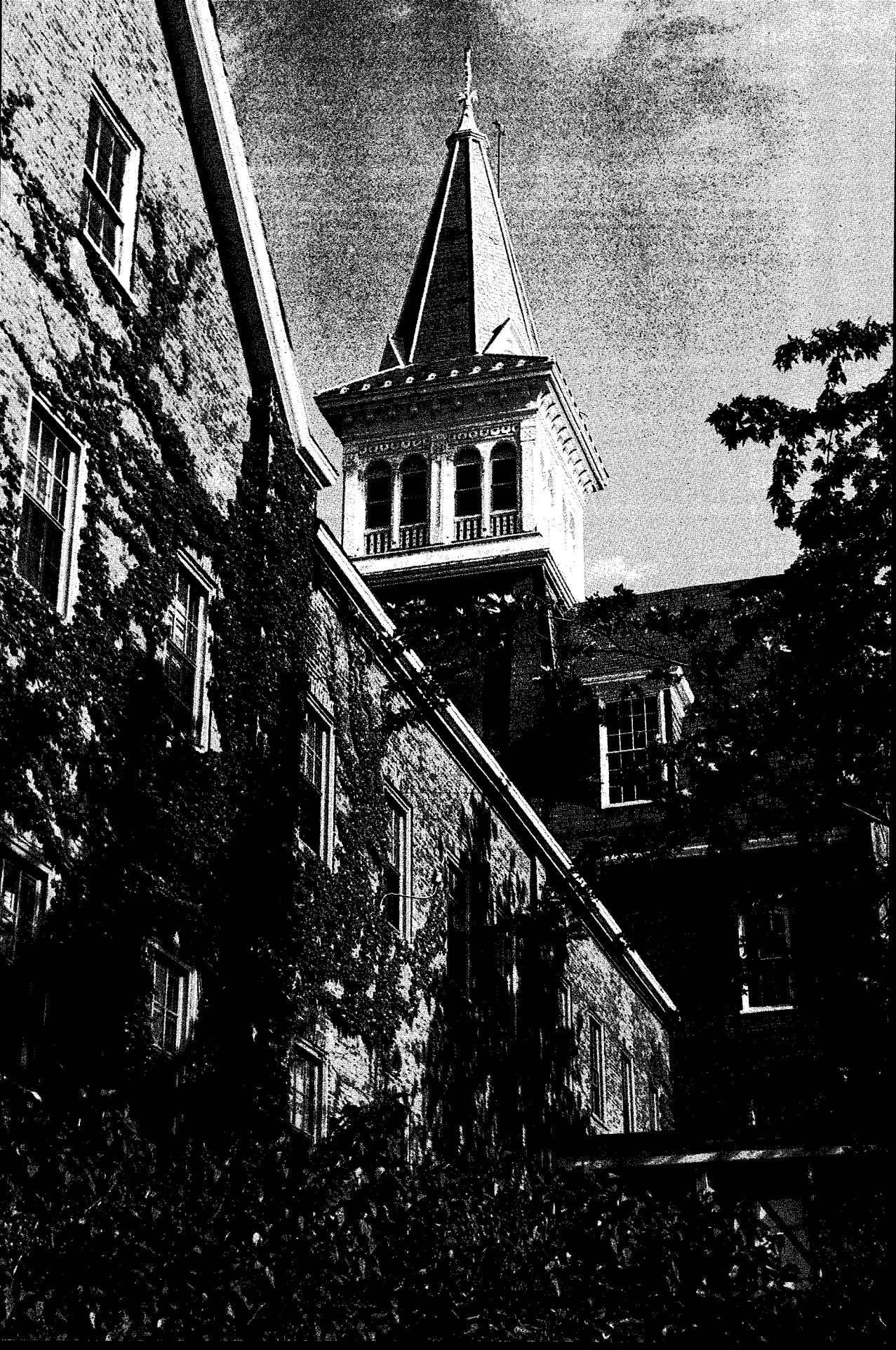
Biology, one year minimum, *with laboratory*

Biology 1, 2

The requirements for admission to colleges of dentistry vary, but in all cases include at least three years of college work. (The majority of applicants will have completed four years.) In general, the minimum requirements given above should be used in planning a program leading to entrance into a dental school. Students should consult catalogues of the dental colleges to which they expect to apply in order to make certain all requirements are met.

In general, students should avoid taking courses at the undergraduate level in those areas taught at the professional level: i.e. human anatomy, human physiology, microbiology. Many medical colleges now strongly recommend or require that students enroll in courses in the humanities and social sciences.

**SECONDARY TEACHING** Students in the College of Arts and Sciences may, upon application to the Dean of Education and Social Services, be accepted into the teacher training program for secondary education. Application should be made before the end of the sophomore year. The prescribed courses in education, up to 24 credit hours, can count as electives towards the Bachelor of Arts. Students completing this program are eligible for Secondary Teacher's Certification.



# The College of Education and Social Services

The College of Education and Social Services offers undergraduate programs in:

- Art Education — Grades K-12
- Elementary Education — Grades K-6
- Music Education — Grades K-12
- Early Childhood
- Health Education
- Physical Education — Grades K-12
- Secondary Education — Grades 7-12
- Social Work
- Human Development and Family Studies

In cooperation with the College of Education and Social Services, the College of Agriculture and Life Sciences offers education programs in:

- Agriculture and Natural Resource Education — Grades 7-12
- Home Economics Education — Grades 7-12
- Industrial Arts/Technology Education — Grades 7-12
- Trades and Industry Education — Grades 9-12

For further information, refer to sections in this catalogue describing the College of Agriculture and Life Sciences, page 45.

These curricula are designed to prepare graduates for early childhood and human development positions, social work, kindergarten-elementary schools, junior high schools, and assignments calling for subject specialties in elementary, secondary, and twelve-grade situations. Programs are composed of general education, professional education, and professional laboratory experiences.

The College has developed course clusters in the area of reading-language arts and special education. The Responsive Teacher Program prepares elementary and secondary regular classroom teachers with special competencies for enhancing the social, personal, and academic growth of handicapped learners.

The Reading Concentration Program provides classroom and special area teachers with an extensive background of skills and understandings in the area of reading and language arts and the relationship of the communications skills to the total school curriculum.

The Early Childhood Development curriculum prepares child development specialists for professional roles in day-care, pre-school, and other settings serving children from birth to school age.

The Human Development and Family Studies major prepares students to work in a variety of settings with individuals and families across the life-span.

The Social Work Program prepares students for beginning professional practice in social work. Students learn how to examine social issues, social problems, the development of social policy, the utilization of social work practice methods, the impact of social policy on social service delivery systems, and how to relate this to the values of social work.

The faculty-student advising process individualizes the program to the student's specific interests and career goals. Upon completion of the sophomore year, students may apply for acceptance in one of these specialized programs for the last two years of their undergraduate career. Programs are also available for individually-designed majors and for careers in interdisciplinary social services and education.

The offices of the Dean of the College are located in Waterman Building.

## ORGANIZATION

The College consists of four departments — Human Development Studies; Organizational, Counseling, and Foundational Studies; Professional Education and Curriculum Development; and Special Education, Social Work, and Social Services.

## DEGREE PROGRAMS

The Bachelor of Science in Education degree is awarded for the following programs:

- Elementary Education —
  - General
  - Reading Concentration
  - Special Education
- Health Education
- Physical Education
- Secondary Education —
  - English
  - General
  - Language
  - Mathematics
  - Science
  - Social Sciences
- Individually Designed Major — Education
- Interdisciplinary —
  - Social Services and Education

The Bachelor of Science degree is awarded for programs in:

- Early Childhood Development
- Human Development and Family Studies
- Social Work

The Bachelor of Science in Art Education is awarded for the program in Art Education, and the Bachelor of Science in Music Education is awarded for the program in Music Education.

In addition, a Postbaccalaureate Teacher Certification Program and a Certificate of Advanced Study (a sixth-year certificate) are offered by the College.

## DEGREE REQUIREMENTS

The College of Education and Social Services has the responsibility for maintenance of standards approved by the National Council for the Accreditation of Teacher Education (N.C.A.T.E.). Initial admission of students is to the University of Vermont College of Education and Social Services — admission to the teacher education program occurs after special tests in basic skills and other screening measures are administered. Students must also meet personal, academic, and professional criteria established for teacher education candidates. This admission procedure is in accordance with the College's standards as approved by the N.C.A.T.E.

All teacher education program candidates are expected to complete admission procedures before the beginning of the junior year in order to fulfill degree requirements. Teacher education candidates must complete the core sequence of EDSS 2, 24, and 56 prior to their junior year.

The programs to be described are the programs through which the UVM College of Education and Social Services achieves accreditation by the N.C.A.T.E. and the Vermont State Department of Education Program Approval Plan. Students completing an N.C.A.T.E. accredited program are qualified to receive

certification in certain states. Graduating seniors are encouraged to contact the certification office of a particular state's department of education for the specific state certification rules. Those completing a Competency program evaluated through the Vermont State Department of Education's Program Approval Plan will have reciprocity certification in neighboring states. Further information may be obtained from the Office for Student Services, Waterman Building.

The College of Education and Social Services has the responsibility for maintenance of standards approved by the Council on Social Work Education. Application for admission to become a social work major occurs after students have completed introductory social work and liberal arts requirements.

The required graduation cumulative average is 2.0. Students must achieve a cumulative average of 2.50 in both the major field and professional courses as a prerequisite to approval for either student teaching or Social Work field experience.

Candidates for a degree at the University of Vermont who desire initial Vermont Teacher Certification should plan to include formal study of the teaching of reading in their programs. The Competency Regulations Governing the Certification of Educational Personnel prescribe the completion of six semester hours in reading for all secondary school teachers (7-12) and nine semester hours for all elementary school teachers (K-6).

**EDUCATION AND SOCIAL WORK** Candidates for the Bachelor of Science in Education and the Bachelor of Science, Social Work major, are required to select a minimum of 60 credit hours from the following five general areas, with the restriction that at least one course must be selected from each area. General education courses required for certification, such as English, social science, mathematics, science, or the University requirement of two semesters of physical education activities, may be used to satisfy the general education requirement in that area. Students may also apply required courses in their major and minor, broad field, or area of concentration to meet requirements in general education.

Arts and Letters:	Social Sciences:
Art	Anthropology
Classics	Economics
Speech and Theatre	Geography
English	History
Music	Political Science
	Psychology
Science and Mathematics:	Sociology
Biology	
Botany	Humanities:
Chemistry	Foreign Language
Computer Science	Philosophy
Geology	Religion
Environmental Studies	
Mathematics	Health and Physical
Physics	Education:
Statistics	Health Education
Zoology	P.E. Methods
	Selected Activities

### EARLY CHILDHOOD AND HUMAN DEVELOPMENT

Students enrolled in the Bachelor of Science majors in Early Childhood Development and in Human Development and Family Studies are required to complete 120 semester hours of course work including:

General requirements	Credits
Behavioral and social sciences	9
Communications skills	9
Humanities	9
Physical and biological sciences	9
Physical Education	
Physical education activities	2
Professional concentration requirements and electives	82

## AREAS OF STUDY

**ELEMENTARY EDUCATION (Kindergarten through Six)** The elementary education program prepares teachers for assignments in grades kindergarten through six. The Bachelor of Science in Education is awarded upon satisfactory completion of the approved program which includes a planned sequence of professional courses and laboratory experience. Students are encouraged to travel and take advantage of opportunities for study abroad. Students who pursue this option should plan their programs accordingly. As a general rule, the department will not permit students to carry out a student teaching internship during the semester following a student semester abroad. Upon completion, graduates are eligible for Vermont teaching certification.

Early Childhood Certification (ages 0-5) may be obtained by enrolling in the Early Childhood Development major in the Department of Human Development Studies.

The elementary education curriculum includes a general component of 60 credits selected from the following academic areas: arts and letters, science and mathematics, social sciences, humanities, and health and physical education (two semesters of physical education activities are required). Electives may be used to build an area of concentration of 24 to 33 credits. Specific information about academic majors or general education requirements may be obtained from advisors or from the Office for Student Services, Waterman Building.

The professional programs begin with the student enrolling in the College of Education and Social Services as a candidate for certification. There are two routes for entrance into candidacy status. A student who is accepted into the College from high school and who is currently in good standing in the College may apply. In addition, a student who is enrolled in another college at the University of Vermont and who is in good standing may apply for candidacy status. Candidates take the Teacher Education CORE Curriculum during their first two years in the College. During CORE, candidates are introduced to the developmental and social foundations of education, and have a guided field experience in a public school.

If a candidate decides to pursue teaching as a career as a result of the CORE experience, the candidates apply to the Teacher Education Program of their choice early in the second semester of their sophomore year. Prior to February of their sophomore year, the student who wishes to qualify for candidacy status in teacher education must complete the following procedures: complete the CESS Teacher Education CORE requirements (or their equivalent) and submit an application for candidacy to the department chair of the Department of Professional Education and Curriculum Development, 533 Waterman. The application lists the current set of criteria that permit a candidate to qualify for consideration in this screening process. Once the candidate's application is complete, the faculty of the desired program will review the materials which include a record of academic performance at UVM, letters of recommendation from CORE faculty, evidence of superior course work, and other pertinent sources of information. The screening of applications at this point is competitive and the number of persons admitted to candidacy varies with the availability of college resources and practicum sites in the public schools. Students who are enrolled in the College of Education and Social Services receive priority consideration.

If a candidate's application to a teacher education program is approved, the candidate completes a sequence of methods courses and applies to intern as a student teacher at least one semester before intending to student teach. The candidate applies to student teach with the Director of Field Experience, Department of Professional Education and Curriculum Development, 533 Waterman. The application lists the current set of criteria that permit a candidate to qualify for student teaching. Included among the criteria are a record of academic perfor-

mance in program and University courses, recommendations from methods faculty, and evidence of superior course work. If admitted to student teaching, the candidate will carry out an internship under the guidance of an approved cooperating teacher and department supervisor. Candidates are recommended for certification by the program faculty if they successfully complete the internship experience.

In addition to the academic and professional requirements, certain courses are recommended to meet specific state and national requirements in elementary education. These are specified in the typical program.

	1st	2nd
<b>FRESHMAN YEAR</b>	<b>SEMESTER</b>	
Educ. 2	3	-
Educ. 24 or equivalent	-	3
Speech 11, Theatre 5	3	or 3
English*	3	or 3
General Electives and/or Approved Electives and/or Area of Concentration		

	1st	2nd
<b>SOPHOMORE YEAR</b>	<b>SEMESTER</b>	
Educ. 56	3	-
Math. 15, 16*	3	or 3
Social Science, Science	3	3

	<b>SEMESTER</b>		
<b>JUNIOR YEAR</b>			
Art 1, 2, or 3	3	or	3
Music Methods*	3		-
Educ./Elem. 134	3	or	3
Educ./Elem. 144	3	or	3
Educ./Elem. 160	3	or	3
Educ./Elem. 121	3	or	3
General Educ. Electives and/or Approved Electives in Area of Concentration			

	1st	2nd
<b>SENIOR YEAR</b>	<b>SEMESTER</b>	
Phys. Educ. 100	-	3
Educ./Gen'l 190	3	or 3
Educ./Elem. 181	8-12	or 8-12
Educ./Elem. 122	-	3
General Educ. Electives Concentration Electives Reading Electives		

\*Recommended to meet specific state and national certificate requirements.

A minimum of 127 approved semester hours is required for the degree including nine semester hours minimum in teaching reading courses for teacher certification.

**The Reading Concentration** The Reading Concentration is designed to maximize the effectiveness of the classroom teacher in the areas of reading, language arts, literature, and drama. This specialization enables teachers to assess students' strengths and weaknesses in reading and to select appropriate instructional methods and materials. Diagnostic and remedial strategies regarding written and oral expression are included. Individual language acquisition and development as well as vocabulary expansion and utilization are important facets of the program. The appreciation and selection of literature for children and youth with attention to resources and available support systems for the classroom teacher are explored. Dramatic expression activities enhance visual and oral communication skills.

A minimum of 18 hours in reading and language arts is required to satisfy the concentration.

Questions concerning the Reading Program should be directed

to Prof. Marjorie Lipson, Coordinator of Undergraduate Reading Program, Professional Education and Curriculum Development Department. The program must contain these courses:

#### JUNIOR YEAR

Reading and Language Arts  
Developmental Reading  
Children's Literature

#### SENIOR YEAR

Reading electives determined in conversation with Reading Coordinator.

#### Special Education-The Responsive Teacher Program

The Responsive Teacher Program is a two-year concentration for students majoring in elementary, secondary, or physical education. Specializations include: Mildly/Moderately Handicapped, Mainstreamed and Intensive Education, Severely Handicapped. This program prepares students to work in areas such as: regular classrooms, resource rooms, special classes, special schools (i.e. schools for autistic children, preschool settings, group homes and adult services). Using a data-based individual model of instruction, the responsive teacher learns to set goals for all students and assures that these goals are met by use of individualized instruction and the application of behavior analysis theory.

Candidates for the Responsive Teacher Program are chosen at the end of their sophomore year and must meet specified entrance requirements. The competency-based program begins in the fall of the junior year with a consecutive two-year schedule, in addition to the regular elementary or secondary program. Responsive Teachers-in-Training attain competencies in specifying minimum objectives in the basic skill areas, measurement systems, individualized instruction, and learning theory. A full-time commitment is expected of each Responsive Teacher-in-Training during the spring semester. Working with a partner, students spend each morning in a classroom where at least one child has been designated as eligible for special education services. Each afternoon students engage in course work and seminars designed to increase the rate of learning for Vermont's eligible children. During their senior year, Responsive Teachers-in-Training will spend a full semester student teaching in a Vermont classroom that contains at least one child eligible for special educational services.

Students who successfully complete this program will be recommended for certification as regular elementary or secondary teachers, with an endorsement for Teacher of the Handicapped.

Questions concerning the undergraduate special education program should be directed to Coordinator of Responsive Teacher Program, Professional Education and Curriculum Development Department.

The program must contain these courses:

	1st	2nd
<b>JUNIOR YEAR</b>	<b>SEMESTER</b>	
Educ./Resp. Tchr. 151	6	-
Educ./Resp. Tchr. 152	-	6
Educ./Resp. Tchr. 160	-	6
<b>SENIOR YEAR</b>	<b>SEMESTER</b>	
Educ./Resp. Tchr. 181	12	-
Educ./Resp. Tchr. 201	3	-
Educ./Resp. Tchr. 165	-	1

A minimum of 127 approved semester hours is required for the degree including six to nine semester hours teaching reading courses for teacher certification. Students are responsible for completing all certification requirements at the elementary or secondary level.





**SECONDARY EDUCATION (Seven through Twelve)** The secondary education program is intended to prepare teachers for junior and senior high schools in Vermont and other states. The Bachelor of Science degree is awarded upon satisfactory completion of an approved program. Upon completion, graduates are eligible for Vermont teaching certification.

The professional programs begin with the student enrolling in the College of Education and Social Services as a candidate for certification. There are two routes for entrance into candidacy status. A student who is accepted into the College from high school and who is currently in good standing in the College may apply. In addition, a student who is enrolled in another college at the University of Vermont and who is in good standing may apply for candidacy status. Candidates take the Teacher Education CORE Curriculum during their first two years in the College. During CORE, candidates are introduced to the developmental and social foundations of education, and have a guided field experience in a public school.

If a candidate decides to pursue teaching as a career as a result of the CORE experience, the candidates apply to the Teacher Education Program of their choice early in the second semester of their sophomore year. Prior to February of their sophomore year, the student who wishes to qualify for candidacy status in teacher education must complete the following procedures: complete the CESS Teacher Education CORE requirements (or their equivalent) and submit an application for candidacy to the department chair of the Department of Professional Education and Curriculum Development, 533 Waterman. The application lists the current set of criteria that permit a candidate to qualify for consideration in this screening process. Once the candidate's application is complete, the faculty of the desired program will review the materials which include a record of academic performance at UVM, letters of recommendation from CORE faculty, evidence of superior course work, and other pertinent sources of information. The screening of applications at this point is competitive and the number of persons admitted to candidacy varies with the availability of college resources and practicum sites in the public schools. Students who are enrolled in the College of Education and Social Services receive priority consideration.

If a candidate's application to a teacher education program is approved, the candidate completes a sequence of methods courses and applies to intern as a student teacher at least one semester before intending to student teach. The candidate applies to student teach with the Director of Field Experience, Department of Professional Education and Curriculum Development, 533 Waterman. The application lists the current set of criteria that permit a candidate to qualify for student teaching. Included among the criteria are a record of academic performance in program and University courses, recommendations from methods faculty, and evidence of superior course work. If admitted to student teaching, the candidate will carry out an internship under the guidance of an approved cooperating teacher and department supervisor. Candidates are recommended for certification by the program faculty if they successfully complete the internship experience.

The secondary education curriculum includes a general component of a minimum of 60 credits selected from the following five academic areas: arts and letters, science, mathematics, social sciences, humanities, and health and physical education (two semesters of physical education activities are required). The student may use electives during the four years to build major and minor fields of study or a broad field major. Academic majors or general education requirements may be obtained from advisors or from the Office for Student Services, Waterman Building. The program includes a planned sequence of professional courses and laboratory experiences.

**TEACHING FIELDS  
FOR SECONDARY EDUCATION**

All teacher education candidates must have, prior to their student teaching, at least 30 credit hours in a teaching major and 18 hours in a teaching minor or at least 48 to 50 hours in a broad field major. The following are current approved majors, minors, and broad field majors (detailed outlines developed in cooperation with the respective departments are available at the Office for Student Services, Waterman Building):

**MAJORS** Biological science, chemistry, earth science, English, French, geography, German, history, Latin, mathematics, physical science, physics, Spanish.

**MINORS** Anthropology, biology, chemistry, coaching, earth science, economics, English, French, geography, German, health education, history, Latin, mathematics, physics, political science, psychology, religion, Russian, sociology, Spanish.

**BROAD FIELD MAJORS** Natural science, social studies, environmental studies. Persons interested in Agricultural and Natural Resources, Home Economics, Industrial Arts/Technology, and Trades and Industry Education programs will find additional information on pages 55-56.

Students should select majors and minors which are logically related and which commonly occur as teaching combinations in secondary schools. The major-minor or broad field program must include credits in advanced courses.

**EXPERIENCES IN PUBLIC SCHOOLS** Students in secondary education usually have direct experiences in public schools throughout most of the four-year curriculum. Students observe and participate as teacher assistants in local junior and senior high schools. During the senior year, students devote 16 continuous weeks to full-time teaching in public secondary schools. In some cases, students must arrange to live off-campus during the student teaching assignment.

Applications for all field experiences must be made at least one semester in advance of assignments, and the student must assume responsibility for meeting deadlines. Information about application and assignment procedures may be obtained from the Office of Field Services.

A typical program is as follows:

	1st	2nd
<b>FRESHMAN YEAR</b>	<b>SEMESTER</b>	
English*	3	or 3
Speech 11, Theatre 5	3	or 3
Educ. 2	3	-
Social Science (Recommended: three credits of U.S. History and three credits of Political Science 21)*	3	3
One Elective from Science and Math. Area	3	or 3
One Elective from Humanities Area	3	or 3
Physical Educ.	1	or 1
General Educ. Electives or Approved Electives in Major and Minor or Broad Field		
Educ. 24	-	3
<b>SOPHOMORE YEAR</b>	1st	2nd
	<b>SEMESTER</b>	
English Lit. Elective	3	or 3
Educ. 56	3	-
General Educ. Electives or Approved Electives in Major and Minor or Broad Field		
<b>JUNIOR YEAR</b>	1st	2nd
	<b>SEMESTER</b>	
Educ./Sec. 6*	2	or 2
Educ./Sec. 178	-	3



Educ./Sec. 179 (Educ./Sec. 182 for English Majors)	-	3
Educ. 137, 138	3	3
	1st	2nd
<b>SENIOR YEAR</b>	<b>SEMESTER</b>	
Educ./Gen'l 190	3	or 3
Educ./Elem. 181	8-12	or 8-12
General Educ. Electives or Approved Electives in Major and Minor or Broad Field		

\*Recommended to meet specific state and national certification requirements.

A minimum of 124 approved semester hours is required for the degree including six semester hours in teaching reading courses for teacher certification.

Students are responsible for obtaining information regarding teacher certification and degree requirements from the appropriate College of Education and Social Services offices.

**ART EDUCATION (Kindergarten through Twelve)** The program in Art Education qualifies candidates to teach art in grades K through 12. Students fulfill general education requirements and complete 42 hours in professional art education and required education courses, 45 hours minimum in studio art, art history, and related subjects. Graduates satisfy College of Education and Social Services requirements for teacher certification and College of Arts and Sciences requirements for an art major. The program allows sufficient additional advanced courses as recommended by the Art Department for admission to graduate school.

Students must be enrolled in the College of Education and Social Services. Those admitted as freshmen or sophomores to the Art Education Program are considered *Candidates* in the Program. Admission as *Majors* is made at the beginning of the junior year following formal review procedures during the second semester of the sophomore year.

A typical program is as follows:

	1st	2nd
<b>FRESHMAN YEAR</b>	<b>SEMESTER</b>	
English	3	or 3
Speech 11, Theatre 5	3	or 3
Educ. 2	3	or 3
Educ. 24	3	3
One Elective from Science and Math. Area	3	3
One elective from Humanities Area	3	or 3
Physical Educ.	1	1
Art 1, 2 or 3	3	3
Art 5, 6	3	3

	1st	2nd
<b>SOPHOMORE YEAR</b>	<b>SEMESTER</b>	
English Lit. Elective	3	or 3
Educ. 56	3	-
Studio Electives		
Related Electives		

	1st	2nd
<b>JUNIOR YEAR</b>	<b>SEMESTER</b>	
Educ./Art 177	4	-
Educ./Art 154	1-6	or 1-6
Art History	3	or 3
Studio Electives		
Related Electives		
Teaching Reading	3	3

	1st	2nd
<b>SENIOR YEAR</b>	<b>SEMESTER</b>	
Educ./Art 141	4	or 4
Educ./Art 183	-	3
Art 281 or 197	3	or 3
Educ./Art 292	2-6	or 2-6
Educ./Sec. 181	8-12	or 8-12
Studio Electives		
Related Electives		
Educ./Gen'l 190	3	or 3

A minimum of 124 approved semester hours is required for the degree including six semester hours teaching reading courses for teacher certification.

Students are responsible for obtaining information regarding teacher certification and degree requirements from the appropriate College of Education and Social Services offices.

### MUSIC EDUCATION (Kindergarten through Twelve)

The curriculum in music education leading to the degree of Bachelor of Science in Music Education is recommended to students who have sufficient training and natural musical ability to justify a career in music. Prospective students must take a placement audition before entering the program. Graduates are qualified for positions as instructors and supervisors of music in the public schools.

The Department of Music is a member of the National Association of Schools of Music, and all its degree programs are accredited by the N.A.S.M.

The program includes a general component of 60 credits selected from the following five academic areas: arts and letters, science, mathematics, social sciences, humanities, and health and physical education (two semesters of physical education activities are required). Students may apply required courses in music to meet the general education requirements.

A typical program is as follows:

### Music Education Major

	1st	2nd
<b>FRESHMAN YEAR</b>	<b>SEMESTER</b>	
Major Instrument (151, 152)	1	1
Ensemble	1	1
Keyboard (5, 6)	1	1
Basic Musicianship (31, 32)	3	3
String Class (83)	1	1
Speech 11 or Theatre 5	3	or 3
Educ. 2, 24 (EDSS)	3	3
Physical Education	1	1
Nonmusic Electives	3	or 3
	<hr/> 17	<hr/> 17

	1st	2nd
<b>SOPHOMORE YEAR</b>	<b>SEMESTER</b>	
Major Instrument (153, 154)	2	2
Ensemble	1	1
Keyboard (7, 8)	1	1
Intermediate Theory (131, 132)	3	3
Theory Lab (133, 134)	1	1
Music History (11, 12)	3	3
Woodwind Class (87)	1	1
Voice Class (85)	1	1
Nonmusic Electives	3	3
	<hr/> 16	<hr/> 16

	1st	2nd
<b>JUNIOR YEAR</b>	<b>SEMESTER</b>	
Major Instrument (251, 252)	2	2
Ensemble	1	1

Arranging (233)	3	-
Conducting (259)	-	3
Elem. Music Methods (281)	3	-
Sec. Music Methods (282)	-	3
Brass Class (81)	1	1
Percussion Class (89)	-	1
Nonmusic Electives	6	6
	<hr/>	<hr/>
	17	18

**SENIOR YEAR**

	<b>1st</b>	<b>2nd</b>
	<b>SEMESTER</b>	
Major Instrument Recital (256)	-	2
Ensemble	-	1
Teaching Reading (EDEL 122)	-	3
Nonmusic Electives	-	9
Student Teaching (ED 181)	12	-
Senior Seminar (ED 190)	3	-
	<hr/>	<hr/>
	15	15

A minimum of 128 approved semester hours is required for the degree including six semester hours teaching reading courses for teaching certification. Students should pass the piano facility examination prior to student teaching. Students are responsible for obtaining information regarding teacher certification and degree requirements from the appropriate College of Education and Social Services offices.

**EARLY CHILDHOOD AND HUMAN DEVELOPMENT**

The Early Childhood and Human Development (ECHD) Program focuses on individual and family development across the life-span. Emphasis is given to development within various family structures and to strategies for facilitating normal development. Students learn basic and applied concepts of human development and acquire skills in working with normal individuals and families of different ages and backgrounds in a variety of settings. Field experience is required of all students.

Students major in one of three areas:

**Early Childhood Development** Early Childhood Development provides the student with academic and practical experiences in working with young children and their families. In addition to classroom instruction, majors spend part of several semesters working in the ECHD program's infant and toddler center and the preschool center—both located on campus.

Students interested in working with infants and young children and their families through educational settings may elect the early childhood education certification option. Students enrolled in the certification option who wish to work with both exceptional and nonexceptional children may be eligible to continue their training for an additional year through the Master's program in Early Essential Education. The requirements of the graduate program are coordinated with those of the undergraduate program, allowing eligible students the opportunity to pursue a five-year integrated sequence leading to both graduate and undergraduate degrees and certification in early childhood development and early essential education. Students in the early childhood education certification option have pursued careers in preschool and day care settings, in movement education, in parent-child centers, in sex education programs, and in kindergarten settings.

Students interested in working with infants and young children and their families but not wishing work in an educational setting may elect the child development specialist option. This option allows students, with the approval of their academic advisor, to define a sequence of specialization courses which will provide the student the necessary entry level skills to work with young children and their families or to continue their education at the graduate level. Students in the child development specialist option have pursued careers working with hos-

pitalized children, in the planning and administration of service programs for children and families, in legislative issues related to children and families, in child development research, and in parent education.

A typical course sequence in Early Childhood Development is:

	<b>1st</b>	<b>2nd</b>
	<b>SEMESTER</b>	
<b>FRESHMAN YEAR</b>		
Intro. to ECHD I, II	3	3
Life-span development I, II	3	3
Early childhood curriculum I, II	3	3
General education requirements and electives	6	6
	<hr/>	<hr/>
	15	15

	<b>1st</b>	<b>2nd</b>
	<b>SEMESTER</b>	
<b>SOPHOMORE YEAR</b>		
Intro. to field experience	1	-
Context of human development I, II	3	3
Parent-child relations	3	-
Human rel. and sexuality	-	3
Early childhood programs	-	3
General education requirements and electives	9	6
	<hr/>	<hr/>
	16	15

**Early Childhood Education Certification Option**

	<b>1st</b>	<b>2nd</b>
	<b>SEMESTER</b>	
<b>JUNIOR YEAR</b>		
Adv. first aid	3	-
Prepracticum experience	3	-
Curriculum course I	3	-
Advanced child development	3	-
Practicum experience	-	15
Elective	3	-
	<hr/>	<hr/>
	15	15

	<b>1st</b>	<b>2nd</b>
	<b>SEMESTER</b>	
<b>SENIOR YEAR</b>		
Field experience	8	-
Curriculum course II	3	-
Adv. seminar: infancy	-	3
Adv. seminar elective	-	3
General education requirements and electives	4	8
Senior paper	-	1
	<hr/>	<hr/>
	16	15

**Child Development Specialist Option**

	<b>1st</b>	<b>2nd</b>
	<b>SEMESTER</b>	
<b>JUNIOR YEAR</b>		
Adv. child development	3	-
Adv. seminar: infancy	-	3
Specialization courses	6	6
General education requirements and electives	6	6
	<hr/>	<hr/>
	15	15

	<b>1st</b>	<b>2nd</b>
	<b>SEMESTER</b>	
<b>SENIOR YEAR</b>		
Field experience I, II	5	8
Specialization courses	6	3
General education requirements and electives	5	3
	<hr/>	<hr/>
	16	14

**Human Development and Family Studies** Students in Human Development and Family Studies take a sequence of courses and field experiences designed to provide a comprehensive understanding of individual and family development across the life-span. These courses are arranged in two blocks — the introductory core and the advanced core.

The introductory core in Human Development and Family Studies involves three course sequences. The first, Introduction to Early Childhood and Human Development I, II and Introduction to Field Experiences, provides students an introduction to the topics pursued in the major, how they relate to everyday life settings, how knowledge in the discipline is gained, and the types of skills necessary to both acquire and use this knowledge. The second sequence in the introductory core is a two-semester course covering individual development across the entire life-span. Students in this course learn what is typical of individuals at different points in their lives and the various factors, such as gender and social class, that account for these differences. The third sequence in the introductory core is a two-semester course dealing with the impact of families and other social institutions such as the school system on individual development. A course on Human Relations and Sexuality completes the introductory core.

The advanced core in Human Development and Family Studies consists of a series of advanced seminars and a field experience. All majors take seminars in Developmental Theory and Family Ecosystems. They then elect three additional advanced seminars from a list that includes infancy, advanced child development, adolescence and youth, adult development, maturity and aging, interpersonal relations, parent-child relations, single-parent families and gender differences. The field experience is usually a one-semester project requiring 15 to 20 hours per week. Students choose a placement from a variety of public and private local agencies. Over the past few years, field placement sites have included museums, affirmative action agencies, the court system, battered women's shelters, centers for abused and neglected children, city and state government agencies, local business and industry, child-care settings, hospitals, senior-citizen centers, and human service agencies.

A typical course sequence for a Human Development and Family Studies major is:

	1st SEMESTER	2nd SEMESTER
<b>FRESHMAN YEAR</b>		
Intro. to ECHD I, II	3	3
Life-span development I, II	3	3
General education requirements and electives	9	9
	<hr/>	<hr/>
	15	15

	1st SEMESTER	2nd SEMESTER
<b>SOPHOMORE YEAR</b>		
Intro. to field experience	1	-
Context of human development I, II	3	3
Human rel. and sexuality	-	3
General education requirements and electives	12	9
	<hr/>	<hr/>
	16	15

	1st SEMESTER	2nd SEMESTER
<b>JUNIOR YEAR</b>		
Adv. seminar I, II	3	3
Family ecosystems	3	-
Development theory	-	3
General education requirements and electives	9	9
	<hr/>	<hr/>
	15	15

	1st SEMESTER	2nd SEMESTER
<b>SENIOR YEAR</b>		
Field experience	6	-
Adv. seminar III	-	3
General education requirements and electives	9	12
	<hr/>	<hr/>
	15	15

Students in any of the two majors may co-enroll in the Home Economics program. This requires completion of the professional concentration course requirements as well as Home Economic requirements.

**SOCIAL WORK PROGRAM** The Social Work Program provides education for social work practice based on a liberal education in the social sciences and humanities. Career opportunities in the profession of social work are explored. The student, in consultation with his/her advisor, selects elective courses which will provide the opportunity to develop individual interests.

Usual sequence of courses:

	1st SEMESTER	2nd SEMESTER
<b>FRESHMAN YEAR</b>		
Professional Courses:		
Soc. Work 2	3	-
Prerequisites for Soc. Work 165, 166:		
Political Science 21	3	or 3
Psychology 1	3	or 3
Sociology 1	3	or 3
Soc. Work 51	-	3
Biology 3	3	or 3

	1st SEMESTER	2nd SEMESTER
<b>SOPHOMORE YEAR</b>		
Professional Courses:		
Soc. Work 47	3	-
Soc. Work 48	-	3
Soc. Work 167	3	or 3
Economics 11	3	or 3
Psychology 152 (or junior year)	3	or 3

	1st SEMESTER	2nd SEMESTER
<b>JUNIOR YEAR</b>		
Professional Courses:		
Soc. Work 165	3	-
Soc. Work 166	-	3
Soc. Work 168	3	-
Soc. Work 169	-	3
Soc. Work 194	3	-
Psychology 152 (or sophomore year)	3	or 3

	1st SEMESTER	2nd SEMESTER
<b>SENIOR YEAR</b>		
Professional Courses:		
Soc. Work 170	12	or 12
Soc. Work 171	3	or 3
Soc. Work 291	-	3

Recommended Electives:

Additional courses in economics, education, political science, psychology, sociology, statistics.

Students must be accepted into the College of Education and Social Services before filing an application as a major. Application for the major requires consultation with an advisor to determine that all the introductory professional and required liberal arts courses have been completed. The application process includes preparation of a written statement by the stu-

dents that states their qualifications to be social work majors and a projection of their future work in the field. Applications are received on either October 15 or February 15 of each academic year. Social Work faculty review and act on each application. Notification of the faculty review is presented to the student in a letter from the Coordinator of the Social Work Program.

The B.S. degree in Social Work requires a minimum of 122 approved credit hours (including two credits for physical education activities) with a minimum of a C- in all professional and required courses and an average of 2.5 in Social Work courses.

**HEALTH EDUCATION (Kindergarten Through Twelve)**

The Health Education program prepares candidates for teaching assignments in health in grades K-12 or in community settings, i.e. health agencies, wellness programs, community health education, etc. Graduates are awarded a degree of Bachelor of Science in Education upon completion of the 124 semester hour program. There is a 41-credit hour general education component which includes 13 hours of science, first aid, and personal health. The 30-hour major is interdisciplinary in nature, drawing upon courses from across the University, to cover the broad spectrum of required health content areas. An 18-credit hour teaching minor is required along with this major to be eligible for Vermont teaching certification. Field placement assignments depend upon satisfactorily meeting program and College criteria.

A typical program is as follows:

	1st	2nd
	SEMESTER	
<b>FRESHMAN YEAR</b>		
Educ./Gen'l 2	3	-
English	3	3
Educ./Hlth. 46	3	-
Speech 11 or Theatre 5	-	3
Humanities <sup>1</sup>	-	3
Science Elective <sup>2</sup>	3	3
Social Science <sup>3</sup>	3	3
Activities	1	1
	<hr/>	<hr/>
	16	16

	1st	2nd
	SEMESTER	
<b>SOPHOMORE YEAR</b>		
Anatomy and Physiology <sup>4</sup>	4	4
Educ./Gen'l 24, 56	3	3
Nutr. Sci. 43 or 46	3	-
Early Childhd. & Human Dev. 65	-	3
Psychology 1	3	-
Teaching Reading	3	3
Educ./Phys. Ed. 23	-	3
	<hr/>	<hr/>
	16	16

	1st	2nd
	SEMESTER	
<b>JUNIOR YEAR</b>		
Educ./Hlth. 220	-	3
Educ./Hlth. 208	3	-
Educ./Hlth. 182	-	3
Educ./Hlth. (Community)	3	-
Educ./Health Elective	-	3
Courses in Minor	9	9
	<hr/>	<hr/>
	15	18

<sup>1</sup>Humanities (any philosophy, religion, or foreign language courses)

<sup>2</sup>Science (select from biology, botany, zoology, chemistry, or physics)

<sup>3</sup>Social Science (six credits from History 7,8, Political Science 11, 21)

<sup>4</sup>Anatomy and Physiology (Zoology 5 and 6, Physiology and Biophysics 19-20, or 100 and 101)

	1st	2nd
	SEMESTER	
<b>SENIOR YEAR<sup>5</sup></b>		
Educ./Gen'l 190	3	-
Educ./Hlth. Electives	6	-
Electives	3	3
Educ./Gen'l 181	-	12
Sociology 57, 58 or Educ./Health Alcohol, Drug Abuse	3	-
	<hr/>	<hr/>
	15	15

<sup>5</sup>Fourth-year fall and spring semesters interchangeable

**PHYSICAL EDUCATION (Kindergarten through Twelve)**

The physical education curriculum includes a selection of courses from within the broad areas of general education, general professional education, specific professional education, and electives. Graduates are awarded a degree of Bachelor of Science in Education upon the completion of a 130-semester hour program.

Students majoring in Physical Education may choose from two curricular options: Teacher Education and Recreational Sports.

The **Teacher Education** option qualifies candidates to teach physical education in grades K-6, 7-12, or K-12 depending upon the focus selected. Those who elect the 30-credit focus upon either grades K-6 or 7-12 will also select an 18-credit minor. Students who prefer a broader teacher preparation focus may select the 48-credit hour comprehensive program that leads to certification for grades K-12; no minor is required.

The **Recreational Sports** option is designed for Physical Education majors who choose to prepare for a professional role in a variety of recreational sports settings. Candidates selecting this option will pursue a 30-credit concentration of course work and an 18-credit minor in a related area.

Candidates in each of the Physical Education options will earn a minimum of eight credits in activity skill courses, the specific course requirements varying with the options selected.

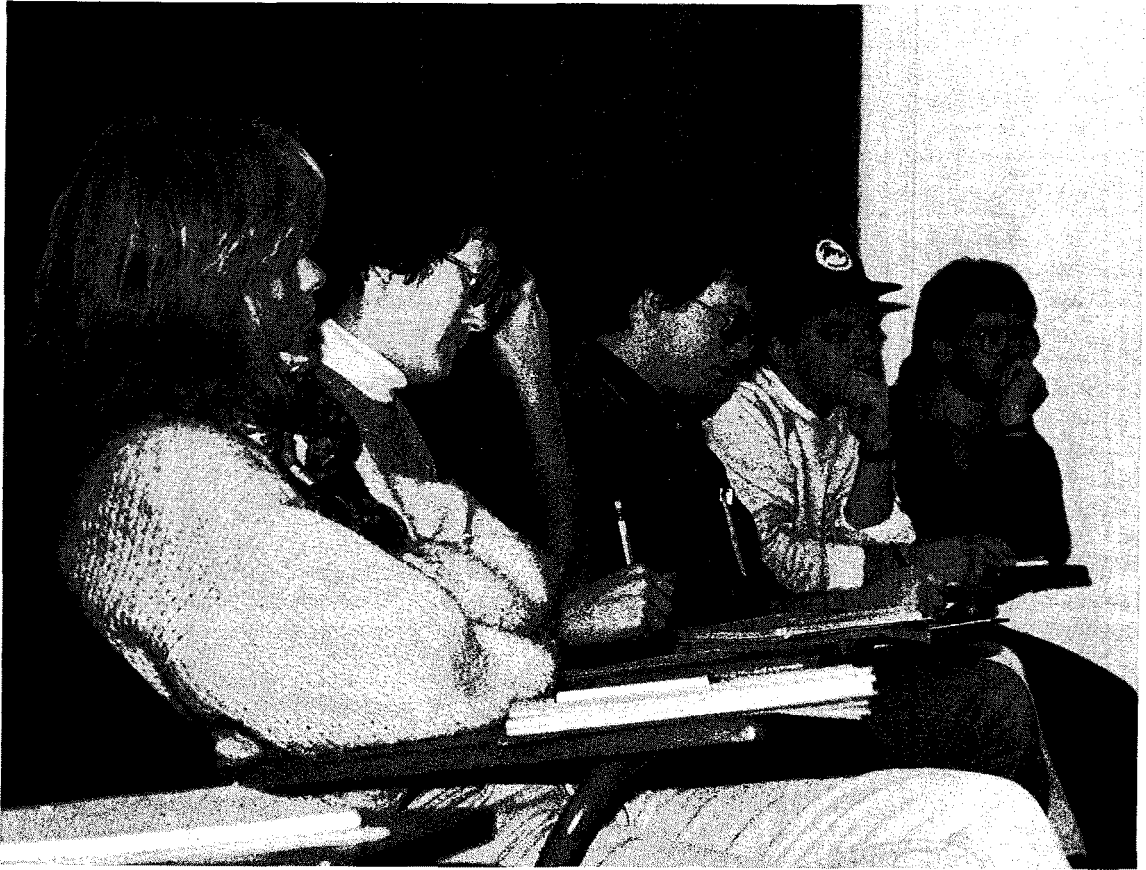
All Physical Education majors must meet departmental criteria before being approved for assignment to a major field placement.

The Athletic Training Program which leads to certification by the National Athletic Trainers Association is available to qualified candidates in the physical education major program.

A typical K-12 program is as follows:

	1st	2nd
	SEMESTER	
<b>FRESHMAN YEAR</b>		
Educ. 2	3	-
English 1	3	-
English Lit. Elective	-	3
Educ./Phys. Ed. 21	3	-
Educ./Hlth. 46	-	3
Humanities <sup>1</sup>	-	3
Science Elective <sup>2</sup>	3	3
Speech 11 or Theatre 5	3	-
Activities	2	2
Educ. 24	-	3
	<hr/>	<hr/>
	17	17

	1st	2nd
	SEMESTER	
<b>SOPHOMORE YEAR</b>		
Social Science <sup>3</sup>	3	3
Psychology 1	-	3
Educ. 56	3	3
Anatomy and Physiology <sup>4</sup>	4	4
Educ./Phys. Ed. 157	2	-
Electives/Activities	5	5
	<hr/>	<hr/>
	17	18



	1st	2nd		3	or	3
<b>JUNIOR YEAR</b>	SEMESTER		Speech 11 or Theatre 5	-		3
Educ./Phys. Ed. 104	5	-	Psychology 1	2		2
Educ./Phys. Ed. 105	-	5		17		17
Educ./Phys. Ed. 166	3	-				
Educ./Phys. Ed. 167	-	3	<b>SOPHOMORE YEAR</b>		1st	2nd
Educ./Phys. Ed. 155	-	3	Social Science <sup>3</sup>	3		3
Educ./Phys. Ed. Elective	2	3	ECHD 80, 81	3		3
Teaching Reading	3	-	Anatomy and Physiology <sup>4</sup>	4		4
Elective	3	3	Educ./Phys. Ed. 157	2		-
	16	17	Educ./Phys. Ed. 55	-		2
			Minor Elective	3		3
			Activities	2		2
				17		17
	1st	2nd			1st	2nd
<b>SENIOR YEAR<sup>5</sup></b>	SEMESTER		<b>JUNIOR YEAR</b>	SEMESTER		
Educ./Gen <sup>1</sup> 190	3	-	Educ./Phys. Ed. 155	3		-
Educ./Phys. Ed. 260	3	-	Educ./Phys. Ed. 166	3		-
Educ./Phys. Ed. Electives	5	-	Educ./Phys. Ed. 167	-		3
Elective	6	-	Educ./Phys. Ed. 192	3		-
Educ./Gen <sup>1</sup> 181	-	12	Educ./Phys. Ed. 193	-		3
	17	12	Educ./Phys. Ed. Elect.	3		3
			Educ./Phys. Ed. Elect.	-		2
			Minor Elective	3		3

A typical Recreational Sports program is as follows:

	1st	2nd
<b>FRESHMAN YEAR</b>	SEMESTER	
Educ./Phys. Ed. 21	3	-
Educ./Hlth. 46	-	3
English 1	3	-
English Lit. Elective	-	3
Humanities <sup>1</sup>	3	-
Science Elective <sup>2</sup>	3	3

<sup>1</sup>Humanities (any philosophy, religion, or foreign language course)  
<sup>2</sup>Science (select from biology, botany, zoology, chemistry, physics, psychology, sociology, or mathematics)  
<sup>3</sup>Social Science (six credits from History 7, 8, Political Science 11, 21)  
<sup>4</sup>Anatomy and Physiology 19-20

Elective	-	3
	<hr/>	<hr/>
	15	17
	1st	2nd
	SEMESTER	
SENIOR YEAR <sup>5</sup>		
Minor Elective	3	-
Minor Elective	3	-
Elective	12	-
Educ./Phys. Ed. 295	-	12
	<hr/>	<hr/>
	18	12

<sup>5</sup>Fourth-year fall and spring semesters interchangeable

*Note: No more than 50 credits in major theory courses included in the 130-credit graduation requirement.*

Physical Education majors will present a minimum of 130 approved semester hours for the degree, including six semester hours of teaching reading courses for those in the Teacher Education Concentration.

Students are responsible for obtaining specific information regarding degree requirements and teacher certification from the appropriate College of Education and Social Services office.

**POSTBACCALAUREATE TEACHER CERTIFICATION PROGRAM** A special fifth-year program culminating in a certificate of advanced study is offered for students who wish to work beyond the Bachelor's degree but who need or desire more flexibility than is possible in any of the standard programs for Master's degrees.

The certificate program is especially designed to meet the needs of teachers who are developing new teaching fields, for advanced students who are meeting requirements for state certification, and for experienced teachers who desire flexibility in choice of courses at both graduate and undergraduate levels.

Each certificate program is individualized to fit the qualifications and the professional objectives of the candidate. Undergraduate courses may be approved for the program when such courses appropriately support the candidate's professional objectives.

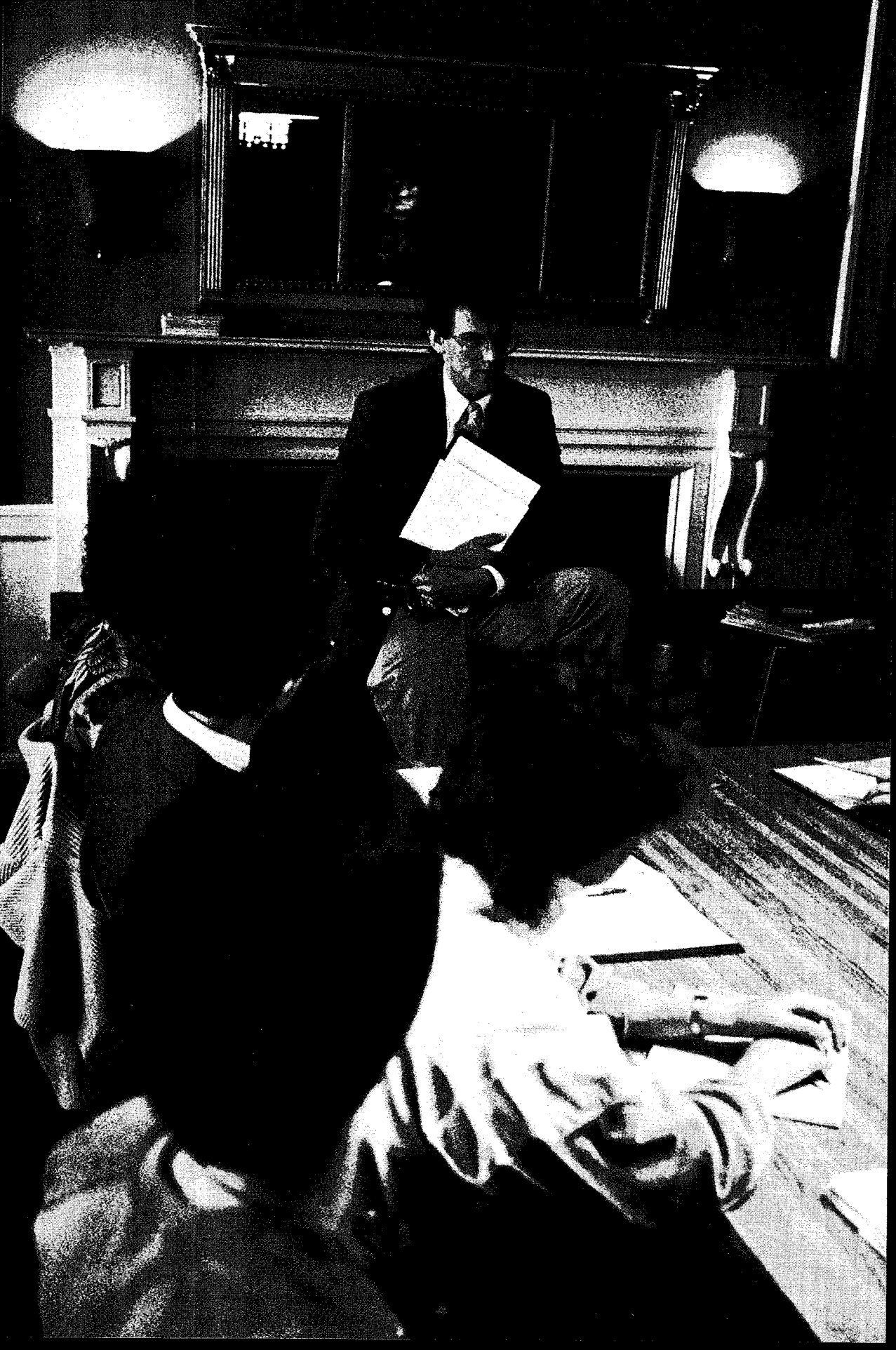
The program for the *Postbaccalaureate Teacher Certification*

*Program* is governed by the following regulations:

1. Candidates must hold a Bachelor's degree.
2. Candidates must make written application on forms obtained from the Office of the Dean of the College of Education and Social Services.
3. Candidates are admitted to the program by action of a faculty committee.
4. A maximum of 12 credits may be applied to the program at the time of admission.
5. A maximum of nine credits may be transferred from other institutions.
6. Credits for the program may be earned in the regular academic year, the Summer Session, and the Evening Division.
7. The program for each candidate must include a minimum of 30 credits approved by a faculty advisor.
8. A minimum mark of C must be made in any course which is to be included in the program.
9. No comprehensive examination or formal thesis is required for completion of the program, but the candidate will submit a culminating paper under the direction of his/her faculty advisor.
10. The program must be completed within seven years after the time of admission.

Requests for further information about fifth-year programs should be directed to Dr. Clinton Erb, Department of Professional Education and Curriculum Development, Waterman Building.

**CERTIFICATE OF ADVANCED STUDY** A certificate of Advanced Study (C.A.S. — sixth-year certificate), a 30-36 graduate credit hour program beyond the Master's degree, is offered by the College of Education and Social Services in the field of Administration and Planning, Counseling, Integrated Studies, and Special Education. The C.A.S. has become a professional requirement in the hiring and advancement of administrative, supervisory, and other personnel in many school districts throughout the United States. The program requires a nine-credit on-campus residency unit. Residency may be fulfilled during any academic semester or summer and is part of the total 30-36 program credits. Further information may be obtained from the Office for Student Services, Waterman Building.





# The Division of Engineering, Mathematics, and Business Administration

The Division of Engineering, Mathematics, and Business Administration includes the College of Engineering and Mathematics and the School of Business Administration.

The Division offers professional undergraduate programs for either professional practice or further study. Because graduates of professional schools are expected to be able to plan and direct in many work situations, as well as to effect and manage change, the primary objective of professional education is to develop skills in problem solving.

Professional graduates must have the ability, confidence, and self-discipline to identify and define a problem; break it down into operable components; gather the necessary resources from the natural and social sciences, mathematics, and the humanities; and employ these resources to solve the problem. The Division promotes these qualities in students by emphasizing a balance between concept and skill in all curricula.

The Division is also committed to learning as a life-long endeavor and, therefore, provides a base for students to build on as their careers and personal interests broaden.

The offices of the Dean of the Division are located in the Kalkin Building.

## DEGREE PROGRAMS

The Bachelor of Science degree is awarded for the following majors:

- Business Administration
- Civil Engineering
- Computer Science
- Electrical Engineering
- Engineering Management
- Mathematics
- Mechanical Engineering

## HONORS PROGRAMS FOR EMBA STUDENTS

### INDIVIDUALLY DESIGNED MAJOR

A student matriculating in the Division who, at the time of application, has completed at least three semesters of full-time study with a cumulative grade-point average of 3.0 or above may propose an individually designed major which builds on an appropriate core program of the Division. The program is designed for the superior student with exceptional initiative and must contain a breadth and depth of courses consistent with regular professional programs or options. The program must be sponsored by a faculty member who will serve as the student's advisor. The program requires prior approval by the appropriate Studies Committee.

### HONORS THESIS PROGRAM

The undergraduate thesis program — designed for the superior student with unusual initiative and intellectual curiosity — provides an opportunity to pursue a special program without the restrictions of classroom routine. The student must be matriculated in the Division at the time of application and have a cumulative grade-point average of at least 3.0 for sophomore and junior work. The honors thesis program is a program of reading, research, design, or creation under the direction of the school, department, or program of the student's choice (not necessarily within the Division). For example, a student might

do a special honors thesis in Physics. The unit establishes the mechanism for thesis review, and the proposal must be approved by the Division Dean's Office no later than the end of the junior year. The thesis, in the form of a written report, must be approved by the participating unit. The student may also be required to pass an oral or written examination at the discretion of the unit as part of the mechanism for review. At the time of graduation, the student's transcript and the graduation program will appropriately be denoted with "Honors Thesis" and the title of the thesis.

Some programs within the Division require senior projects as part of the prescribed curriculum. For the superior student, these projects may offer opportunities similar to the honors thesis program.

## COOPERATIVE EDUCATION PROGRAM

The Division offers a cooperative education (CO-OP) program to students with cumulative grade-point averages placing them in the upper half of their class. Before acceptance, each candidate must be interviewed and approved by the program coordinator and the prospective employer. The program lets students apply their learning to a full-time, paid position in a business, industrial, or government setting. It is designed to fit into a normal four-year academic program. In each curriculum area, there is a faculty member responsible for CO-OP students, serving also as the students' academic advisor and coordinating on-site visits to work assignments. Participants must submit learning objectives and an end-of-work report at the end of each assignment. Although the Division attempts to place all qualified students admitted to the program, it cannot guarantee the availability of positions.

The CO-OP office is located in the Center for Career Development in E Building of the Living/Learning Center.

## DEGREE REQUIREMENTS AND ACADEMIC REGULATIONS

### ACADEMIC STANDARDS

Students who receive a cumulative or semester grade-point average of less than 2.0 will be placed on trial. Students who have failed half their course credits for any semester, or who have had two successive semester averages below 2.0, or three successive semesters in which their cumulative grade-point average falls below 2.0, are eligible for dismissal.

To receive a degree in a major, students must have a minimum cumulative average of 2.0. Students must complete 30 of the last 45 hours of credit in residence at the University of Vermont as matriculated students in the Division of Engineering, Mathematics, and Business Administration. Additional degree requirements are specified for each major.

### CREDIT FOR MILITARY SERVICE

The Division does not, in general, grant credit for military service. Credit for specific courses or other academic experience acquired during military service may be available through petition to the appropriate Studies Committee.

### CREDIT FOR CALCULUS

Refer to page 37 in the section on General Information.

### PHYSICAL EDUCATION

In addition to the course requirements listed for each curricu-

lum, all students must satisfactorily complete two credits of physical education activities.

### RESEARCH AND SPECIAL PROJECTS

Opportunities for undergraduate research and work on special projects are offered by the School, departments, and programs of the Division. Credit may be arranged, with a maximum of four hours per semester. No more than 12 hours of courses in these categories may be used to satisfy the requirements for the B.S. degree. It is understood that credit for such courses is contingent upon submission of a final report or other acceptable evidence of project completion.

### TRANSFER CREDIT

Transfer credits from other institutions are not used in the calculation of the University of Vermont grade-point average. Students who wish transfer credits to satisfy specific requirements in their major in the Division must obtain approval from their department in the College of Engineering and Mathematics or the School of Business Administration.

## School of Business Administration

The School of Business Administration offers a challenging and rigorous education to prepare its students for promising careers in industry, government, and nonprofit organizations. The graduates from this program will be equipped with the broad knowledge and analytical tools needed to operate effectively as line and staff managers in the rapidly changing management environment.

The program is designed to cultivate the student's capacity to recognize, define, and solve problems in the most efficient manner possible. To this end, it is required that the student be exposed to a wide range of courses in the arts, humanities, and the social and physical sciences.

The first two years establish the broad intellectual base upon which the art and science of management are built and are devoted to partial completion of distribution requirements and to acquisition of the technical skills on which Upper Level management courses rely.

The junior year completes the business core. Eight required courses develop the framework for organizing information and structuring analysis in the context of an operating enterprise. Course work is offered in finance, human resource management in a global environment, information systems, marketing, and production, in addition to the accounting courses taken in the sophomore year. The School believes that a broad but demanding program is in the best interest of the student's career opportunities.

The final year is devoted to senior business electives, the required business policy course, and free electives.

The School of Business Administration cooperates with the College of Engineering and Mathematics in offering a B.S. in Engineering Management. The course offerings are described on page 90.

The undergraduate and Master's business programs offered by the School of Business Administration are accredited by the American Assembly of Collegiate Schools of Business (AACSB).

The offices of the School of Business Administration are located in the Kalkin Building.

### DEGREE REQUIREMENTS

A minimum of 122 approved semester hours is required for the

degree of Bachelor of Science in Business Administration, including two required hours in physical education and a minimum of 55 hours in areas other than business administration and upper-level economics.

Physical education courses in excess of the required two credits will not count toward the 122 credits required for graduation.

The 55 hours must be completed within the following guidelines:

- A. Language and Literature:
  1. English 1 (three hours)
  2. Any two of the following: English 21, 22, 23, 24, 25, 26, or 50 (six hours)
  3. At least three hours from the following:
 

Area and International Studies	Italian
Chinese	Latin
English	Russian
Film	Spanish
French	Speech
German	General Literature
Greek	Classics 22
Hebrew	Classics 42
	Linguistics 101, 102
- B. Social Sciences, Fine Arts, and Philosophy:
  1. Economics 11 and 12 (six hours)
  2. History 7 or 8, or Political Science 21 (three hours)
  3. Psychology 1 or Sociology 1 (three hours)
  4. At least three hours from the following:
 

Anthropology	Political Science
Geography	Psychology
History	Sociology
Art	Religion
Music	Classics 42
Philosophy	Theatre
- C. Mathematics/Sciences and Professional/Technical:
  1. Mathematics 19 and 20 or 21 and 22 (six or eight hours)
  2. Statistics 141 (three hours)
  3. Computer Science 11 (three hours)
  4. Two lab sciences\* (eight hours)
  5. At least three more hours from the following:
 

Biology	Geology
Botany	Mathematics
Chemistry	Physics
Computer Science	Statistics
Engineering	Zoology

\*Note: Either the History of Science or Philosophy of Science may substitute for one lab science. The lab science courses typically would be selected from among the biology, botany, chemistry, geology, microbiology, physics, and zoology offerings. Computer science courses *cannot* be used to fulfill this requirement.
- D. The remainder of the 55 hours must be selected from areas A, B, or C above.

### ADMISSION TO UPPER LEVEL BUSINESS PROGRAM

In order to be admitted to the Upper Level program of the School and therefore to continue as a major in the School, an undergraduate must:

- A. Have completed at least 54 credits with an average of 2.0 or better.
- B. Have obtained a minimum GPA in the Freshman/Sophomore Core of:
  1. 2.25 with the Math. 19-20 sequence or
  2. 2.10 with the Math. 21-22 sequence

**AREAS OF STUDY**

Here is an illustrative schedule for the first two years. The student may rearrange the sequencing of courses as desired.

	1st SEMESTER	2nd SEMESTER
<b>FRESHMAN YEAR</b>		
*Math. 19 or 21	3 or 4	-
English 1	3	-
Psychology 1 or Sociology 1	3	-
*Economics 11, 12	3	3
Distribution Elective	3	3 or 4
*Math. 20 or 22	-	3 or 4
History 7 or 8, or Political Science 21	-	3
One of English 21-26	-	3
	<hr/> 15-16	<hr/> 15-17

	1st SEMESTER	2nd SEMESTER
<b>SOPHOMORE YEAR</b>		
*BSAD 60, 61	4	4
English 50 (or 21-26)	3	-
Distribution Electives	6 or 7	9 or 10
*Computer Science 11	3	-
*Statistics 141	-	3
	<hr/> 16-17	<hr/> 16-17

\*Denotes Freshman/Sophomore Core

During the junior year, the student will take courses in all of the functional areas of management and will do additional work in economics, quantitative methods, and the socio-political environment in which business functions. The junior core courses are:

BSAD 120	Principles of Management and Organizational Behavior	3
BSAD 132	Legal and Political Environment of Business	3
BSAD 141	Management Information Systems	3
BSAD 154	Marketing Management	3
BSAD 172	Managerial Economics	3
BSAD 173	Production and Operations Analysis I	3
BSAD 180	Managerial Finance	3
	Quantitative Methods*	3

\*The three hours required in quantitative methods may be satisfied by selecting a course from among Statistics 151, 201, 221, 225, 229, 231, or Business Administration 170, 177, 178, or 179.

	1st SEMESTER	2nd SEMESTER
<b>JUNIOR YEAR</b>		
Junior Business Core Elective	12	12
	3	3
	<hr/> 15	<hr/> 15

In the senior year, the student must complete at least 12 additional hours in Upper Level elective business courses beyond those required in the Junior/Senior Core. These courses must be selected in such a way that they build upon prior work and upon each other and point toward the analysis of a coherent subset of managerial problems. An acceptable approach is to concentrate these courses in one of the areas of Accounting, Finance, Human Resource Management, Management Information Systems, Marketing, International Management, or Production and Operations Management. However, the student may also complete a cross-functional program. In either case, the specific set of Upper Level business electives *must* be approved by the student's advisor. See page 84 for a detailed listing and description of courses in the various functional areas.

	1st SEMESTER	2nd SEMESTER
<b>SENIOR YEAR</b>		
Senior Business Elective	6	6
Electives	9	6
BSAD 191, Business Policy	-	3
	<hr/> 15	<hr/> 15

Additional course work needed to meet the 122 hour requirement for graduation are free electives and may be satisfied by any UVM course subject to two restrictions:

1. No more than two hours in physical education may be counted toward the 122;
2. No credit will be granted for a course if credit has been received previously in a more advanced course in the same general discipline.

In order to graduate, students must maintain a cumulative GPA of 2.0 in the courses comprising the Junior/Senior Core and a minimum of 12 hours of Upper Level business electives.

In the event that a student does not have a 2.0 GPA in the Junior/Senior core and 12 hours of approved Upper Level business electives, the student will not be allowed to attempt to raise their Junior/Senior GPA by repeating courses. That GPA may be raised only by completing additional approved Upper Level business credits.

**PROFESSIONAL ACCOUNTING PROGRAM**

Students planning to sit for the CPA examination should complete the Professional Accounting Program outlined below. Completion of the Professional Accounting Program satisfies the Upper Level elective business course requirement.

BSAD 17	Business Law	3
BSAD 161, 162	Intermediate Accounting	6
BSAD 164	Introduction to Federal Taxation	3
BSAD 168	Cost Accounting	3
BSAD 166	Advanced Accounting	3
BSAD 167	Auditing	3

Additionally, a second Business Law course (BSAD 18) and a second Finance course (beyond BSAD 180) are recommended. These two additional courses are required for students who plan to sit for the CPA examination in New York.

**INTERNATIONAL MANAGEMENT**

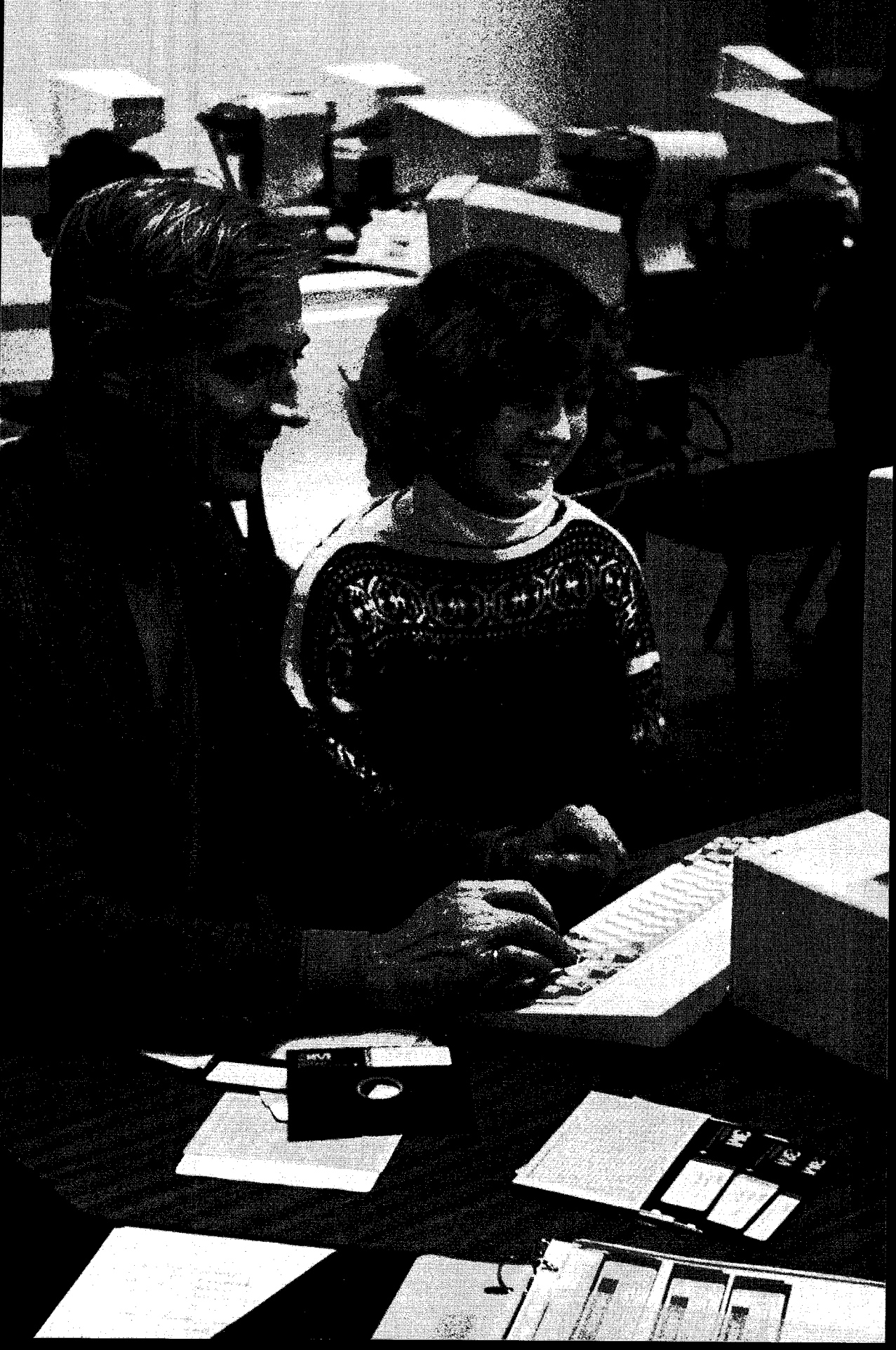
The program in international management is open to all Business Administration majors and includes up to a full academic year in an overseas business program.

The University has formal arrangements with both the University of Nice and the University of Grenoble. In the Nice program, students will spend one year abroad completing a total of ten courses. Four of these will substitute for Junior Core courses and three or four will constitute international management electives. The remaining courses will be European culture/society and will substitute for distribution requirements. ALL INSTRUCTION IS IN FRENCH. Students are required to demonstrate proficiency in French which is well beyond the intermediate level.

The Grenoble program gives the student the opportunity to spend the spring semester at the University of Grenoble. The program consists of 14 credit hours in international business, French culture and society, and the French language. All courses are taught in English; however, students are advised that some background in French is desirable.

It is also possible for students to spend a year at other European and Canadian universities under the international management program. These individually designed programs may be arranged in consultation with the program advisor.

For further information on these programs, contact Prof. Cats-Baril at 656-0510.



# The College of Engineering and Mathematics

The College of Engineering and Mathematics offers undergraduate curricula in Civil Engineering, Computer Science, Electrical Engineering, Management Engineering, Mathematics, and Mechanical Engineering, leading to the Bachelor of Science degree.

The offices of the Dean of the College are located in the Votey Building.

## ORGANIZATION

The College of Engineering and Mathematics consists of three departments: Computer Science and Electrical Engineering, Civil Engineering and Mechanical Engineering, and Mathematics and Statistics; and two programs: Materials Science and Statistics.

## ACADEMIC STANDARDS

In order to continue as a major in the College of Engineering and Mathematics, a student must achieve a 2.0 cumulative grade-point average at the completion of the semester in which 60 cumulative credit hours have been attempted. No more than three repeated course enrollments are allowed during this 60-credit period. In the case of transfer students, applicable transfer credits will be included in determining the 60 credit hours, but grades in these courses will not be included in the grade-point average.

No more than three grades of D, D+, or D- in the major subject will count towards fulfillment of graduation requirements.

## AREAS OF STUDY

### COMPUTER SCIENCE CURRICULUM

Computer Science is one of the mathematical sciences, although there are strong ties to electrical engineering. It is the study of the theoretical basis, design, and application of electronic computing machines.

The Computer Science curriculum provides a broad basic training in Computer Science with required courses in the theory of computing, hardware design, and software techniques. A minor specialization in an allied field is required so that students develop an appreciation for the applicability of their knowledge of computer science.

Requirements for the degree of Bachelor of Science in Computer Science are as follows:

*Computer Science:* 11, 12, 101, 102, 103, 104, plus four 200-level courses. One of these must be 224 or 243. Two are to be chosen from 201, 203, 222.

*Mathematics:* 21, 22, 104, 121, 124, 173

*Electrical Engineering:* 100, 131

*Physics:* 31 with 21; 42 with 22, or 125

*Statistics:* 151

*Other:* English 1, Speech 11

*Minor Field:* Six semester courses for a minimum of 18 credits in an allied area. Suggested areas are: business administration, social science, physical science, biological science, mathematics, statistics, or engineering.

In order to assure that the courses chosen to constitute the minor specialization form a cohesive unit, all minor programs must be approved by a Computer Science faculty advisor.

**Distribution Requirements:** A student must complete at least two semester courses for a minimum of six credits in each of the two areas:

- A. Social Science to include:
 

Anthropology	Political Science
Economics	Psychology
Geography	Sociology
History	
- B. Humanities, Fine Arts, and Philosophy to include:
 

Language	Music
Literature	Speech
Art	Philosophy
Drama	Religion

Courses used to fill the other requirements may not be used to fill the distribution requirement.

A typical program in Computer Science is as follows:

	1st	2nd
FRESHMAN YEAR	SEMESTER	
CS 11, Comp. Prog. I	3	-
Math. 21, Calculus I	4	-
English 1, Written Exp.	3	-
Electives	6	6
CS 12, Comp. Prog. II	-	3
Math. 22, Calculus II	-	4
Speech 11	-	3
	16	16

	1st	2nd
SOPHOMORE YEAR	SEMESTER	
CS 101, Intro.	3	-
Math. 121, Calculus III	4	-
Math. 104, Computation	3	-
Physics 31 with 21	4	-
Elective	3	3
CS 102, Software	-	3
Math. 124, Linear Algebra	-	3
Physics 42 with 22	-	4
Statistics 151, App. Prob.	-	3
	17	16

	1st	2nd
JUNIOR YEAR	SEMESTER	
CS 103, Prog. Languages	3	-
EE 100, EE Concepts	4	-
EE 131, Digital Comp. Design	3	-
Electives	6	6
CS 104, Data Structures	-	3
CS 222 or 243	-	3
Math. 173, Comb. Theory	-	3
	16	15

	1st	2nd
SENIOR YEAR	SEMESTER	
CS 200-level courses	6	3
Electives	9	9
	15	12

A minimum of 123 semester hours is required, plus two credits of physical education activities.

## ENGINEERING CURRICULA

The College of Engineering and Mathematics offers professional programs in Civil, Electrical, and Mechanical Engineering accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (ABET). Interdisciplinary engineering programs offered by the College include Engineering Management offered in cooperation with the School of Business Administration, and a curricu-

lum in Engineering Physics in cooperation with the Department of Physics. The latter leads to the degree of Bachelor of Science.

Engineering education at UVM combines the study of mathematics and the physical, life, and engineering sciences with application to the analysis and design of equipment, processes, and complete systems.

The breadth and flexibility of the engineering programs provide a sound background for engineering practice in private or public domains, for graduate study in engineering and science, and for further professional study in such fields as business, law, or medicine.

Courses in the humanities and social sciences (HSS) are required in engineering programs to broaden the student's understanding of mankind and relationships in human society. At least 18 credit hours must be selected from the list presented here. The courses are divided into three categories: (A) language and literature; (B) fine arts, philosophy, and religion; and (C) social sciences. At least nine credit hours must be in one category, and at least six credit hours must be in one department area.

Category	Courses
C	Agricultural and Resource Economics: 2, 61, 162, 205, 208, 254
C	<sup>2</sup> Air Force Studies at St. Michael's: 401-403
C	Anthropology: all courses* <i>except</i> : 200, 290
B	Art: All Art History courses*
C	Botany: 6
A	<sup>3</sup> Chinese: all courses*
A	<sup>3</sup> Classics: all courses*
C	Economics: all courses* <i>except</i> : 100, 200
	Education:
C	Early Childhood and Human Development: 60, 61, 62, 63, 64, 65
C	Foundational Studies: 204, 205, 206, 255
A	English: all courses* <i>except</i> : 1, 50, 53, 177, 178, and Film courses
C	Environmental Studies: 1, 2, 100
A	Extra-Departmental Courses: all General Literature courses
C	Geography: 1-17, 51-62, 146-171, 175-179
A	<sup>3</sup> German: all courses*
A	<sup>3</sup> Hebrew: all courses*
C	History: all courses*
C	<sup>4</sup> Military Studies: 2, 4
B	Music: all History and Literature courses*
C	Natural Resources: 40
C	Nursing: 20
B	Philosophy: all courses*
C	Political Science: all courses* <i>except</i> : 183
C	Psychology 1, 119, 130, 132, 150, 152, 161, 162, 205, 206, 233, 234, 237
B	Religion: all courses*
C	Resource Economics: 121
A	<sup>3</sup> Romance Languages: all courses*
A	<sup>3</sup> Russian: all courses*
C	Social Work: 2, 47, 48, 51, 165, 166, 167, 168, 169
C	Sociology: all courses* <i>except</i> : 100, 274, 275
B	Theatre: 1, 136, 137, 138

\*Special topics, seminars, honors, reading and research, or internships are not normally considered appropriate humanistic Social Study electives.

<sup>1</sup>The Dean's Office and the Curriculum Committee review courses that are offered intermittently, and an updated list of these offered courses is available in the Dean's Office.

<sup>2</sup>Air Force Studies 401-403 are three-credit hour courses. Upon completion of the sequence, four credit hours toward the HSS requirements in the engineering curriculum at UVM will be granted. Since most of the other HSS electives are three-credit hour courses, 401 and 403 together usually constitute one HSS course.

<sup>3</sup>Grammar and conversational courses in a student's native language(s) are not acceptable for HSS credit. Elementary level language courses are not acceptable for HSS credit in areas where they duplicate credit received in high school, or as determined by UVM language instructors. If elementary languages are chosen, students must complete that level.

<sup>4</sup>Military Studies 2 and 4 are two-credit hour courses. Since most of the other HSS electives are three-credit hour courses, 2 and 4 together usually constitute one HSS course.

It is possible for engineering students who wish to do so to extend their undergraduate curriculum beyond the typical four-year schedules outlined on the following pages. Those who would like to complete requirements over a longer time period must meet with their faculty advisor to plan how this can be done.

Engineering students can become affiliated with their respective national professional engineering societies: the American Society of Civil Engineers, the Institute of Electrical and Electronics Engineers, and the American Society of Mechanical Engineers. Each of these organizations has an authorized student chapter at the University. Engineering students demonstrating high scholarship attainment, combined with exemplary character, are recognized by membership in the Vermont Alpha Chapter of Tau Beta Pi, the national engineering honor society. In addition, all engineering students may become affiliated with the student chapter of the Society of Women Engineers. These student organizations present opportunities for students to conduct activities similar to those of the national societies.

## FRESHMAN CURRICULUM FOR ENGINEERING STUDENTS

	1st SEMESTER	2nd SEMESTER
FRESHMAN YEAR		
CS 11, Comp. Prog. I	3	-
English 1, Written Exp.*	3	-
Chemistry 1, Intro.	4	-
Math. 21, 22, Calculus I & II	4	4
HSS Elective*	3	3
Physics 31 with 21, Fund. of Physics**	-	4
Math. 31, Numerical Meth.	-	3
ME 2, Graph. Comm.**	-	2
Phys. Ed.	1	1
	18	17

\*Some students will be asked to take English 1 in the second semester. These students should take two HSS courses in the first semester.

\*\*In the Mechanical Engineering Option 2, Physics 31 with 21 is replaced by Chemistry 42. In the Electrical Engineering Options 3 and 4, Physics 31 with 21 is replaced by Chemistry 42 for Option 3, and Chemistry 2 for Option 4. In Electrical Engineering Options 3 and 4, ME 2 is not required. Two HSS electives should be taken in the spring semester for Option 3.

**CIVIL ENGINEERING** The curriculum in Civil Engineering, leading to the degree of Bachelor of Science in Civil Engineering, offers instruction in environmental engineering, hydraulics and hydrology, planning, soil mechanics, structural engineering, and transportation engineering, as well as in the engineering sciences, mathematical sciences, natural sciences, humanities, and the social sciences.

There are two options leading to the degree of Bachelor of Science in Civil Engineering: General Civil Engineering and Environmental Engineering. The degree requires a minimum of 129 semester hours, plus two credits of physical education activities.

### OPTIONS 1 and 2: General Civil Engineering and Environmental Engineering

	1st SEMESTER	2nd SEMESTER
SOPHOMORE YEAR		
Math. 121, Calculus III	4	-

Physics 125, Electromag. & Optics	4	-
CE 1, Statics	3	-
CE 10, Surveying	4	-
Statistics 141, Basic Meth.	3	-
Math. 271, App. Math. for Eng.	-	3
Science Elective or Chem. 2**	-	4
ME 12, Dynamics	-	3
Option Course*	-	3-4
HSS Elective	-	3
	<hr/>	<hr/>
	18	16-17

\*General civil engineering option students take CE 11; environmental engineering option students take Microbiology 55 (Introductory Microbiology).

\*\*Option 2 students take Chemistry 2.

	1st	2nd
JUNIOR YEAR	SEMESTER	
CE 100, Mech. of Materials	3	-
CE 150, Env. Eng.	3	-
CE 160, Hydraulics	4	-
EE 100, Concepts I	4	-
ME 41, Thermo.	4	-
CE 101, Materials Testing	-	2
CE 140, Trans. Planning	-	3
CE 151, Waste Water Eng.	-	3
CE 170, Struct. Analysis I	-	4
HSS Elective	-	3
	<hr/>	<hr/>
	18	15

**OPTION 1: General Civil Engineering**

	1st	2nd
SENIOR YEAR	SEMESTER	
CE 125, Eng. Economy	3	-
CE 171, Struc. Analysis II	3	-
CE 172, Adv. Struc. Design	3	-
CE 180, Soil Mech.	4	-
HSS Elective	3	3
CE 130, Eng. Planning	-	2
CE 173, Reinforced Conc.	-	3
Professional Elective*	-	3
Design Elective**	-	3-4
	<hr/>	<hr/>
	16	14-15

\*Professional electives are the following: any 200-level CE course and CE 141, 142, 181, 191, and 192; other courses by permission of advisor.

\*\*Option 1 Design electives are the following CE courses: 141, 142, 181, 230, 232, 250, 251, 255, 256, 258, 261, 280.

**OPTION 2: Environmental Engineering**

	1st	2nd
SENIOR YEAR	SEMESTER	
CE 125, Eng. Economy	3	-
Professional Elective***	3	-
CE 172, Adv. Struc. Design	3	-
CE 180, Soil Mech.	4	-
HSS Elective	3	3
CE 173, Reinforced Conc.	-	3
Design Elective*	-	3
Science Elective**	-	3-4
	<hr/>	<hr/>
	16	12-13

\*Design electives for Option 2 are the following CE courses: 250, 251, 255, 256, 258, 261.

\*\*Science electives are one of the following: Chemistry 42, Chemistry 141, CE 254, Plant and Soil Science 264, Natural Resources 276, Biology 1, Zoology 9.

\*\*\*Professional electives are the following: all courses listed as Design Electives in Option 1 and CE 130, 171, 191, 192; advanced courses in Natural Resources with permission of advisor.

**ELECTRICAL ENGINEERING** The curriculum in Electrical Engineering leading to the degree of Bachelor of Science in Electrical Engineering, offers instruction in electrical and electronic circuits, semiconductor devices, signal and system analysis, digital systems, control systems and design, as well as in engineering, physical and life sciences, humanities, and social sciences.

There are four options leading to an ABET accredited degree of Bachelor of Science in Electrical Engineering: General Electrical Engineering, Computer Engineering, Biomedical Engineering, and Premedical Engineering. The degree requires a minimum of 130 semester hours for Options 1 and 2 and 129 semester hours for Options 3 and 4. In addition, two credits of physical education activities are required.

**OPTION 1: General Electrical Engineering**

	1st	2nd
SOPHOMORE YEAR	SEMESTER	
Math. 121, Calculus III	4	-
Physics 125, Electromag. & Optics	4	-
EE 3, 4, Engr. Anal. I & II	3	3
EE 81, 82, Sophomore Lab	2	2
HSS Electives	3	3
Math. 271/124/Statistics 151	-	3
Physics 128, Modern Physics	-	4
EE 140, Electromag. Field Theory	-	3
	<hr/>	<hr/>
	16	18

	1st	2nd
JUNIOR YEAR	SEMESTER	
EE 120, 121, Electronics I & II	3	3
EE 141, Electromag. Field Theory	3	-
EE 163, 164, Solid State Phys. I & II	3	3
EE 171, 172, Signals & Sys. I & II	4	4
EE 183, 184, Junior Lab	2	2
EE 134, Micro Based Sys.	-	4
	<hr/>	<hr/>
	15	16

	1st	2nd
SENIOR YEAR	SEMESTER	
EE 113, Elec. Energy Dis.	3	-
Non-EE Engr. Sci. Elective	3	-
Tech. Elective	3	-
HSS Electives	3	3
EE Design Tech. Electives	3	3
EE 185, 186, Senior Lab	1	1
EE Tech. Elective	-	3
Approved Elective	-	3
EE Engr. Sci. Elective	-	3
	<hr/>	<hr/>
	16	16

**OPTION 2: Computer Engineering**

	1st	2nd
SOPHOMORE YEAR	SEMESTER	
Math. 121, Calculus III	4	-
Physics 125, Electromag. & Optics	4	-
EE 3, 4, Engr. Analysis I & II	3	3
EE 81, 82, Soph. Lab	2	2
EE 131, 132, Digital Design	3	3
Math. 104/271/Statistics 151	-	3
Physics 128, Intro. Modern Physics	-	4
HSS Elective	-	3
	<hr/>	<hr/>
	16	18



	1st	2nd		
	SEMESTER			
<b>JUNIOR YEAR</b>			Physics 31 & 21, Intro. Phys.	4 -
EE 163, Solid State Phys. I	3	-	Biology 1, 2, Prin. of Biology	4 4
HSS Elective	3	-	EE 3, 4, Engr. Analysis I & II	3 3
EE 120, 121, Elec. I & II	3	3	EE 81, 82, Sophomore Lab I & II	2 2
EE 171, 172, Signals and Sys.	4	4	Physics 42 with 22, EM & Mod. Phys.	- 4
EE 183, 184, Junior Lab	2	2	Math. 271/124/Statistics. 141	- 3
EE 134, Micro Based Sys.	-	4		
EE 140, Electromag. Field Theory	-	3		
	<hr/>	<hr/>		<hr/>
	15	16		

	1st	2nd		1st	2nd
	SEMESTER			SEMESTER	
<b>SENIOR YEAR</b>			<b>JUNIOR YEAR</b>		
EE 141, Field Theory	3	-	HSS Elective	3	-
EE 187, Senior Proj.	3	-	EE 163, Solid St. Phys. I	3	-
CS 12, Prog. II	3	-	EE 120, 121, Electronics I & II	3	3
CS 101, Intro.	3	-	EE 183, 184, Junior Lab I & II	2	2
Non-EE Engr. Sci. Elective	3	-	Chemistry 141, 142, Organic Chem.	4	4
EE 185, 186, Senior Lab	1	1	EE 134, Micro Based Sys.	-	4
CS 102, Software	-	3	EE 140, Electromag. Field Theory	-	3
Technical Elective	-	3		<hr/>	<hr/>
EE Eng. Sci. Elective	-	3		15	16
HSS Electives	-	6			
	<hr/>	<hr/>			
	16	16			

**OPTION 3: Biomedical Engineering**

	1st	2nd		1st	2nd
	SEMESTER			SEMESTER	
<b>SOPHOMORE YEAR</b>			<b>SENIOR YEAR</b>		
Math. 121, Calculus III	4	-	Non-EE Eng. Sci. Elective	3	-
Physics 31 with 21, Intro. Phys.	4	-	EE 141, Electromag. Field Theory	3	-
HSS Elective	3	-	EE 113, Elect. Energy Dis.	3	-
EE 3, 4, Eng. Analysis I & II	3	3	EE 171, 172, Signals & Sys. I & II	4	4
EE 81, 82, Soph. Lab I & II	2	2	EE 185, 186, Senior Lab I & II	1	1
Math. 271/124/Statistics 141	-	3	HSS Electives	3	6
Physics 42 with 22, EM & Mod. Phys.	-	4	EE Design Elective	-	3
EE 140, Electromag. Field Theory	-	3	EE Engr. Sci. Elective	-	3
	<hr/>	<hr/>		<hr/>	<hr/>
	16	15		17	17

**ENGINEERING MANAGEMENT** A curriculum in Engineering Management, leading to the degree of Bachelor of Science in Engineering Management, is offered in cooperation with the School of Business Administration. Engineering Management is a broad discipline concerned with the art and science of planning, organizing, directing, and controlling activities that have a technical component. Designing, producing, selling, and servicing products in the marketplace require managers who possess both an ability to apply engineering principles and a skill in managing technical projects and people in technical jobs. The curriculum is designed to provide a basic education in an engineering discipline with the study of management concepts and techniques. The curriculum incorporates the equivalent of one-half year of study in the area of the humanities and social sciences. Candidates for this degree must earn a minimum of 126 semester hours, depending upon the engineering option selected, plus two credits of physical education activities.

**OPTION 1: Civil Engineering**  
(128-130 hours)

	1st	2nd		1st	2nd
	SEMESTER			SEMESTER	
<b>JUNIOR YEAR</b>			<b>SOPHOMORE YEAR</b>		
Biology 1; Prin. of Biol.	4	-	CE 1, Statics	3	-
EE 141, Electromag. Field Theory	3	-	CE 10, Surveying	4	-
EE 163, Solid St. Phys. I	3	-	Economics 11, Prin. of Economics	3	-
EE 120, 121, Electronics I & II	3	3	Math. 121, Calculus III	4	-
EE 183, 184, Junior Lab I & II	2	2	Bus. Ad. 60, Financial Acctng.	4	-
Physiol. & Biophys. 101	-	4	Math. 271, Applied Math.	-	3
EE 134, Micro Based Sys.	-	4	Bus. Ad. 61, Managerial Acctng.	-	4
HSS Elective	-	3	Physics 42 with 22, EM & Mod. Phys.	-	4
	<hr/>	<hr/>	ME 12, Dynamics	-	3
	15	16	ME 14, Mechanics of Solids	-	3
				<hr/>	<hr/>
				18	17

**OPTION 4: Premedical Engineering**

	1st	2nd
	SEMESTER	
<b>SOPHOMORE YEAR</b>		
Math. 121, Calculus III	4	-

	1st SEMESTER	2nd SEMESTER
JUNIOR YEAR		
Statistics 211, Stat. Methods I	3	-
EE 100, Elect. Engr. Concepts I	4	-
Economics 12, Prin. of Economics	3	-
CE 160, Hydraulics	4	-
Bus. Ad. 120, Mgmt. & Organ. Behav.	3	-
CE 140, Transp. Planning	-	3
Bus. Ad. 141, Mgmt. Info. Systems	-	3
CE 170, Structural Analysis	-	4
Bus. Ad. 173, Prod. & Oper. Analy. I	-	3
HSS Elective	-	3
	<hr/>	<hr/>
	17	16

	1st SEMESTER	2nd SEMESTER
SENIOR YEAR		
CE 125, Engr. Economy	3	-
CE 150, Environmental Engr. Technology 185, Senior Project	3	-
HSS Elective	3	-
Bus. Ad. 178, Quality Assurance	3	-
Bus. Ad. 179, Operations Research	-	3
CE Conc. Elective*	-	3-4
Bus. Ad. 175/176, Hum. Fctrs./Plant Pln.	-	3-4
Engr. Mgmt. Elective**	-	3
	<hr/>	<hr/>
	15	12-14

\*CE Concentration electives: CE 11, 141, 151, 180, 195 (Construction or Facilities Engineering); ME 41; and Technology 80  
 \*\*Engineering Management electives: Bus. Ad. 144, 158, 174, 272; and Statistics 224, 229.

**OPTION 2: Electrical Engineering**  
(126-128 hours)

	1st SEMESTER	2nd SEMESTER
SOPHOMORE YEAR		
Economics 11, Prin. of Economics	3	-
Math. 121, Calculus III	4	-
Bus. Ad. 60, Financial Acctng.	4	-
EE 3, 4, Engr. Analysis I, II	3	3
EE 81, 82 Sophomore Lab I, II	2	2
Math. 271, Applied Math.	-	3
Bus. Ad. 61, Managerial Acctng.	-	4
Physics 42 with 22, EM & Mod. Phys.	-	4
	<hr/>	<hr/>
	16	16

	1st SEMESTER	2nd SEMESTER
JUNIOR YEAR		
Statistics 211, Stat. Methods I	3	-
Economics 12, Prin. of Economics	3	-
EE 163/171, Solid State/Sign. Sys.	3-4	-
Bus. Ad. 120, Mgmt. & Organ. Behavior	3	-
EE 120, 121, Electronics I, II	3	3
Bus. Ad. 141, Mgmt. Info. Systems	-	3
EE 134/172, Micro. Syst./Sign. Syst.	-	4
Technology 80, Systems Modeling	-	3
Bus. Ad. 173, Prod. & Oper. Analy. I	-	3
	<hr/>	<hr/>
	15-16	16

	1st SEMESTER	2nd SEMESTER
SENIOR YEAR		
CE 125, Engr. Economy	3	-
Technology 185, Senior Project	3	-
Bus. Ad. 178, Quality Assurance	3	-
HSS Electives	3	3
EE 131, 132, Dgtl. Comp. Design	3	3
Bus. Ad. 179, Operations Research	-	3

Bus. Ad. 175/176, Hum. Fctrs./Plant Pln.	-	3-4
Engr. Mgmt. Elective*	-	3
	<hr/>	<hr/>
	15	15-16

\*Engineering Management electives: Bus. Ad. 144, 158, 174, 272; and Stat 224, 229.

**OPTION 3: Mechanical Engineering**  
(127-130 hours)

	1st SEMESTER	2nd SEMESTER
SOPHOMORE YEAR		
CE 1, Statics	3	-
ME 41, Heat Transfer	4	-
Economics 11, Prin. of Economics	3	-
Math. 121, Calculus III	4	-
Bus. Ad. 60, Financial Acctng.	4	-
Math. 271, Applied Math.	-	3
Bus. Ad. 61, Managerial Acctng.	-	4
Physics 42 with 22, EM & Mod. Phys.	-	4
ME 12, Dynamics	-	3
ME 14, Mechanics of Solids	-	3
	<hr/>	<hr/>
	18	17

	1st SEMESTER	2nd SEMESTER
JUNIOR YEAR		
Statistics 211, Stat. Methods I	3	-
EE 100, Elect. Engr. Concepts I	4	-
Economics 12, Prin. of Economics	3	-
ME 101, Engr. Materials	3	-
Bus. Ad. 120, Mgmt. & Organ. Behav.	3	-
ME 170, Mechanical Design	-	4
Bus. Ad. 141, Mgmt. Info. Systems	-	3
EE 101/ME 102, EE Concepts/Mtls.	-	3-4
Bus. Ad. 173, Prod. & Oper. Analy. I	-	3
HSS Elective	-	3
	<hr/>	<hr/>
	16	16-17

	1st SEMESTER	2nd SEMESTER
SENIOR YEAR		
CE 125, Engr. Economy	3	-
ME 143, Fluid Mechanics	3	-
Technology 185, Senior Project	3	-
HSS Elective	3	-
Bus. Ad. 178, Quality Assurance	3	-
Bus. Ad. 179, Operations Research	-	3
ME Conc. Elective*	-	3-4
Bus. Ad. 175/176, Hum. Fctrs./Plant Pln.	-	3-4
Engr. Mgmt. Elective*	-	3
	<hr/>	<hr/>
	15	12-14

\*ME concentration electives: ME 42, 144, 161, 162, 171; and EE 131, 134.

\*\*Engineering Management electives: Bus. Ad. 144, 158, 174, 272; and Statistics 224, 229.

**MECHANICAL ENGINEERING** The curriculum in Mechanical Engineering, leading to a degree of Bachelor of Science in Mechanical Engineering, offers instruction in design, solid and fluid mechanics, materials, manufacturing processes and systems, thermodynamics, tribology and energy systems, as well as in engineering, life and physical sciences, humanities, and social sciences, including aspects of professional engineering such as law, safety, and economics.

There are two options leading to the degree of Bachelor of Science in Mechanical Engineering: General Mechanical Engineering and Biomedical Engineering. The degree requires a minimum of 130 semester hours, plus two credits of physical education activities.

	1st	2nd
<b>SOPHOMORE YEAR</b>	<b>SEMESTER</b>	
Math. 121, Calculus III	4	-
CE 1, Statics	3	-
ME 41, Thermo.	4	-
HSS Elective	3	-
Physics Course*	4	4
Math. 271, App. Math. for Eng.	-	3
ME 12, Dynamics	-	3
ME 14, Mech. of Solids	-	3
ME 42, Engr. Thermo.	-	3
	<hr/>	<hr/>
	18	16

\*General mechanical engineering option students take Physics 125 and 128; biomedical engineering option students take Physics 31 with 21 and 42 with 22.

**OPTION 1: General Mechanical Engineering**

	1st	2nd
<b>JUNIOR YEAR</b>	<b>SEMESTER</b>	
ME 101, Materials I	3	-
ME 111, Sys. Dynamics	3	-
ME 143, Fluid Mech.	3	-
EE 100, Concepts I	4	-
ME 123, Junior Lab	1	-
HSS Elective	3	-
ME 102, Materials II	-	3
ME 144, Basic Heat Trans.	-	4
EE 101, Concepts II	-	4
ME 124, Junior Lab	-	1
ME 170, Mech. Design I	-	4
	<hr/>	<hr/>
	17	16

	1st	2nd
<b>SENIOR YEAR</b>	<b>SEMESTER</b>	
ME 161, Manufacturing	3	-
ME 171, Mech. Design II	3	-
ME 183, Senior Lab	1	-
ME 185, Senior Project	2	-
ME 253, Tribology I	4	-
Tech. Electives*	3	3
ME 162, Manufacturing II or ME 172, Mech. Design III	-	4
ME 186, Senior Project	-	1
HSS Electives	-	6
	<hr/>	<hr/>
	16	14

\*Technical electives (2): Any 100-level or above courses in Division of EMBA (except Statistics 11 I), or in Physical or Life Sciences, with permission of advisor.

**OPTION 2: Biomedical Engineering**

	1st	2nd
<b>JUNIOR YEAR</b>	<b>SEMESTER</b>	
Biology 1, Prin. of Biol.	4	-
ME 101, Materials I	3	-
ME 123, Junior Lab	1	-
ME 111, System Dynamics	3	-
ME 143, Fluid Mech.	3	-
HSS Elective	3	-
ME 144, Heat Transfer	-	4
Physiology & Biophys. 101	-	4
ME 170, Mech. Design I	-	4

	1st	2nd
ME 124, Junior Lab	-	1
ME 102, Materials II	-	3
	<hr/>	<hr/>
	17	16
<b>SENIOR YEAR</b>	<b>SEMESTER</b>	
EE 100, Concepts I	4	-
ME 171, Mech. Design II	3	-
ME 183, Senior Lab	1	-
ME 185, Senior Project	2	-
Physiology & Biophys. 102	4	-
HSS Electives	3	3
EE 101, Concepts II	-	4
ME 172, Mech. Design III	-	4
ME 186, Senior Project	-	2
	<hr/>	<hr/>
	17	13

**MATHEMATICS AND STATISTICS CURRICULA**

The College of Engineering and Mathematics offers programs in several areas of the mathematical sciences and their applications. Curricula lead to the Bachelor of Science degree in Mathematics for programs in Applied Mathematics, Mathematics, and Statistics.

**Core Curriculum for Applied Mathematics and Mathematics**

Math. 21, 22, 102, 121, 124 and 241 or 251. Computer Science 11.

**Core Curriculum for Statistics**

Math. 21, 22, 102, 121, 124 and Stat. 241. Computer Science 11.

In addition to one of the above core curricula, candidates for the B.S. degree in Mathematics must complete the following requirements:

- A. **Major Courses.** Twenty-four additional hours in Mathematics, Statistics, or Computer Science courses numbered 100 or above. Of these 24 hours, at least 18 hours must be numbered 200 or above and not more than 12 hours may be chosen from Computer Science.
- B. **Allied Field Courses.** Twenty-four hours selected from:
  - (1) Physical Sciences
  - (2) Biological Sciences
  - (3) Medical Sciences
  - (4) Engineering
  - (5) Computer Science
  - (6) Agricultural Sciences
  - (7) Business Administration
  - (8) Psychology
  - (9) Economics
 (12 or higher)

Of these 24 hours, at least six hours must be in courses numbered 100 or above, and at least six must be taken in fields (1) to (5).

- C. **Humanities and Social Sciences.** Twenty-four hours selected from categories 1, 3, and 4 (excluding "e") on page 59. These must be distributed over at least two categories, and at least six hours must be taken in each of the two categories chosen.

*Note:* Courses used to satisfy the requirements in B above may not be used to satisfy requirements in C.

- D. A minimum of 120 semester hours is required, plus two credits of physical education activities.

**MATHEMATICS** The curriculum in Mathematics is designed to provide sound basic training in mathematics, to prepare the student for a position in an area in which persons with mathematical skills and insights are sought, and to qualify

students for advanced study in graduate school. Students in the College of Arts and Sciences may major in Mathematics and receive the Bachelor of Arts degree. An advisor from Mathematics will assist students in the determination of programs best suited to their individual needs and plans.

Students major in Mathematics with a variety of goals and career objectives. Students work out with a faculty advisor a program of courses consistent with their aims; but to indicate the variety of possibilities, the following is a list of options available within the requirements set forth above:

**Pregraduate Training.** Designed for students who plan to do graduate work in a mathematical science. The program of study will prepare students for advanced work at the graduate level. Recommended Mathematical Sciences courses include Math. 207, 230, 240, 241, 242, 251, 252.

**Secondary Education.** Provides mathematical training for students seeking careers as teachers in secondary schools. Recommended Mathematical Sciences courses include Math. 251, 252, 255, 257, 260, 261, Statistics 151, 211. The student should consult the College of Education and Social Services concerning nonmathematical courses needed for certification.

**General.** Intended for students whose career goals require exposure to a broad range of mathematical topics. It is recommended for premedical students and for students who are interested in the quantitative aspects of allied electives such as economics, business, biology, etc. Students in this option are advised to take several courses in Applied Mathematics, Statistics, and Computer Science as well as several courses in a chosen allied elective area.

Students electing any of the above options must meet the requirements for a B.S. in Mathematics as stated above.

In addition to the above advisory options, a major in Applied Mathematics is available as described below.

**APPLIED MATHEMATICS** Students pursuing a B.S. in Mathematics may elect applied mathematics as their major. The purpose of the curriculum in applied mathematics is to combine mathematical techniques with applications in order to equip the student to deal with a large spectrum of practical problems. Emphasis is on the mathematics involved in the solution of typical problems and on the process of modeling a variety of phenomena.

There are two options in applied mathematics. Students specializing in applied mathematics must complete all of the requirements given above for the B.S. in Mathematics including the more specific requirements in one of the following options. Further recommended courses are also listed to serve as a guide to students when choosing the remainder of their curriculum.

**Mathematics of Computation.** This option stresses problem solving by computers. The program includes areas where computing is important in applying the mathematics, and covers methods required for such computing. Required courses are Math. 173, 230, 237, 238, 274 and Statistics 141 or 211. Further recommended courses include Statistics 151, Math. 207, 224, 240, 273, and Computer Science 12, 242.

**Industrial Mathematics.** This option stresses classical applied mathematics and the mathematics of decision making. Included in this program of study are such areas as operations research, modeling, and applications to government and industry. Students in the ROTC program will find courses in this option especially valuable in the military. Required courses are Math. 207, 221, 222, 230, 237, 238, 272, 276. Further recommended courses include Math. 224, 236, 240, 241, 264, 274, Statistics 141 or 211, 229, and Physics 31 with 21, 125.

**STATISTICS** Students receiving the B.S. degree in Mathematics may elect Statistics as their major. In addition, students receiving a B.A. degree in Arts and Sciences may specialize in Statistics as a part of their Mathematics major. Statistics is a mathematical science extensively used in a wide variety of fields. Indeed, every discipline which gathers and interprets data uses statistical concepts and procedures to understand the information implicit in their data base. Statisticians become involved in efforts to solve real world problems by developing and investigating stochastic models, designing surveys and experimental plans, constructing and interpreting descriptive statistics, and developing and applying statistical inference procedures. To investigate new statistical procedures requires a knowledge of mathematics and computing as well as statistical theory. To apply concepts and procedures effectively also calls for an understanding of the field of application.

The curriculum is designed for students who plan to enter business, industry, or government as statisticians, to become professional actuaries, or to continue to graduate school in statistics or a related quantitative field (biostatistics, operations research, demography, biomathematics, etc.). The courses and curricula are administered through the Statistics Program Steering Committee which includes faculty from Mathematics and Statistics, College of Medicine Biometry Facility, Physiology and Biophysics, Business Administration, Psychology, Forestry, the Agricultural Experiment Station, and the Academic Computing Center. This broad representation of disciplines affords students excellent opportunities for gaining direct experience in the application of statistics.

Students specializing in statistics are required to complete the requirements given above for the B.S. in Mathematics with the following specific requirements:

- Mathematical Science courses must include 21 semester hours of Statistics including 141 or 211, 151 or 251, 241 or 261, 221 or 227 or 229, and 281.
- Allied field courses must include a laboratory science course (six credits). Students in consultation with their Statistics advisor must plan a sequence of allied field courses consistent with their professional and career goals. Students interested in pursuing intensive studies in an area not specifically listed are encouraged to plan a program with their advisor and submit it to the Studies Committee for review and approval.
- Humanities and Social Sciences must include English 1 and Speech 11.

**Premedical Concentration in Statistics.** Those students who wish to enter medical college should review catalogues during their freshman or sophomore year of those institutions to which they anticipate applying. In addition, the Office of Career Development should be contacted during a student's junior year regarding the specifics of the medical school application process.

Each student electing the premedical concentration will fulfill the general requirements for the Statistics major. In addition, the premedical concentration should include as a minimum Chemistry 1, 2, or 11, 12, 13, 14, at least one year of physics with laboratory (Physics 31 with 21, 42 with 22), and at least one year of biology with laboratory (Biology 1, 2).

Exposure to medical research problems will be provided through supervised experiences in the College of Medicine Biometry Facility.

Further details on the Statistics major and minor curricula may be obtained at the Statistics Program Office.



# The Division of Health Sciences

The Division of Health Sciences brings together several related programs: the School of Allied Health Sciences, the School of Nursing, and the College of Medicine.

## The School of Allied Health Sciences

The School of Allied Health Sciences offers a variety of programs in response to social and health care needs of the community. It encourages interaction among students and faculty in meeting these needs. All programs offer clinical education experiences in a variety of appropriately approved hospitals and health facilities in Vermont and throughout the country. The academic programs are accredited by the responsible agencies. Criteria for academic standards will be given to students at registration time and also are available upon request from the Dean's and departmental offices.

The offices of the Dean of the School are located in Rowell Building.

### ORGANIZATION

The School consists of four departments: Dental Hygiene, Medical Technology, Physical Therapy, and Radiologic Technology.

### DEGREE PROGRAMS

The Bachelor of Science degree is awarded for the following programs:

- Medical Technology
- Physical Therapy

The Associate in Science degree is awarded for programs in:

- Dental Hygiene
- Radiologic Technology
- Nuclear Medicine Technology
- Radiation Therapy

### DEGREE REQUIREMENTS

Requirements for admission and requirements for the degrees offered in the School are detailed under the specific areas of study which follow. The School of Allied Health Sciences reserves the right to require the withdrawal of any student from the School whose health, academic record, or performance and behavior in the professional programs is judged to be unsatisfactory.

### AREAS OF STUDY

**DENTAL HYGIENE** The Department of Dental Hygiene offers a two-year curriculum leading to an Associate in Science degree and a Certificate in Dental Hygiene.

The program is accredited by the Commission on Dental Accreditation of the American Dental Association. Graduates are eligible to write the National Board Examination in Dental Hygiene and meet requirements for licensure determined by most individual states.

Dental hygienists are health professionals who, in cooperation with the dental profession, strive to provide services which promote optimum oral health for the public. Dental hygiene services are primarily educational and preventive in nature

and they are provided through a variety of health care settings including general and specialty dental practices, community health agencies, and public schools.

Requirements for admission to the Dental Hygiene program are identical with general University requirements. Applicants are welcome to visit the department and to discuss dental hygiene with faculty and students.

As this program of study is scientifically orientated, high school courses in algebra, chemistry, and biology are important prerequisites. Personal attributes essential to success include good health, emotional stability, task orientation, high moral standards, and an ability to relate well with patients of all ages.

The courses of study are designed to give the student a well-rounded foundation in basic sciences, specific knowledge in dental sciences, and an understanding of the humanities. Clinical experience is obtained in the Department's dental hygiene clinic where patients of all ages and with varieties of problems receive service. Dental hygiene students also have an opportunity to increase their communication skills through oral health education presentations in schools in the area.

The dental hygiene curriculum is highly structured and the semester course loads are heavy. Students who have the opportunity and the desire to complete liberal arts and/or basic science courses prior to entering the program are encouraged to do so. Further guidance can be gained by calling or writing to the departmental office.

	1st	2nd
<b>FIRST YEAR</b>		
	<b>SEMESTER</b>	
Dental Hygiene 1, 2	4	2
Dental Hygiene 11, 12	3	3
Dental Hygiene 61	-	2
Nutr. Sci.	3	-
Anatomy & Physiology 19-20	4	4
Chemistry 3	-	4
English 1 (or higher level)	3	-
Psychology 1	-	3
Physical Education	1	-
	18	18
<b>SECOND YEAR</b>		
	<b>SEMESTER</b>	
Dental Hygiene 62	-	3
Dental Hygiene 91	2	-
Dental Hygiene 141	3	-
Dental Hygiene 143	3	-
Dental Hygiene 146	-	2
Dental Hygiene 181-182	4	4
Microbiology 55	4	-
Sociology or Anthropology	-	3
Speech 11	-	3
Elective	-	3
	16	18

A minimum of 70 approved semester hours and a grade-point average of 2.0 is required for the Associate in Science degree in this curriculum. A grade of "C" or better is required for all professional courses.

**MEDICAL TECHNOLOGY** The Department of Medical Technology offers a four-year curriculum leading to the baccalaureate degree. The program is accredited by the National Accrediting Agency for Clinical Laboratory Sciences and the Com-

mittee on Allied Health Education and Accreditation of the American Medical Association.

Requirements for admission are the same as the general University requirements, with the addition that applicants must have taken high school biology and chemistry; physics is highly recommended.

The program is designed to prepare individuals for professional practice and to promote personal development as responsible members of society by providing a reasonable balance between general education content and specific medical laboratory knowledge and practice. Courses in the humanities and basic sciences are taken in departments throughout the University, including the College of Medicine. Clinical laboratory experience is obtained in the laboratories at the University, the Medical Center Hospital of Vermont, and the VT-NH Red Cross Blood Center.

On completion of the baccalaureate program, graduates are eligible for national certification details of which are explained during the final year.

	1st	2nd
	SEMESTER	
FIRST YEAR		
Chemistry 1-2	4	4
Medical Technology 1	0	-
Medical Technology 3	1	-
English	3	-
Math. (by placement)	3-4	-
Computer Science	-	3
Medical Technology 34	-	3
Electives	3	6
Physical Education	1	1
	<hr/>	<hr/>
	15-16	17

	1st	2nd
	SEMESTER	
SECOND YEAR		
Anatomy & Physiology 19-20	4	4
Medical Technology 23	4	-
Medical Technology 61	2	-
Medical Technology 54	-	2
Microbiology 55	-	2
Chemistry 42	-	4
Electives	6	3-6
	<hr/>	<hr/>
	16	15-18

	1st	2nd
	SEMESTER	
THIRD YEAR		
Biochemistry 201	3	-
Biochemistry 210	1	-
Biochemistry 212	-	4
Medical Technology 102	-	2
Medical Technology 242	-	4
Microbiology 222	4	-
Pathology 101	3	-
Statistics 111 or 141	-	3
Electives	6	3
	<hr/>	<hr/>
	17	16

	1st	2nd
	SEMESTER	
FOURTH YEAR		
Medical Technology 120, 130, 150, 160	2.5-4	2.5-4
Medical Technology 131	3	-
Medical Technology 155	3	-
Medical Technology 122	-	3.5
Medical Technology 162	-	3
Medical Technology 195	3	-
Medical Technology 196	-	2

Medical Technology 197	1	-
Elective	3	3
	<hr/>	<hr/>
	15.5-17	14-15.5

A minimum of 127 semester credit hours including two credit hours of physical education, an overall grade-point average of 2.0, and a 2.0 GPA in professional courses are required for graduation.

A student of at least junior standing whose minimum grade-point average is 3.0 in professional and basic science courses and who demonstrates a keen interest in Medical Technology is eligible for invitation by the faculty to participate in the departmental honors program. Students who accept the invitation will select a course of work from one of these possible options: participation in at least two senior level specialty seminars with a comprehensive exam, completion of an independent research project, or completion of an independent reading thesis. Excellent and committed work will be required for a student to be granted Departmental Honors.

**Option: Cytotechnology** The Department of Medical Technology, in cooperation with the School of Cytotechnology at the Medical Center Hospital of Vermont, offers a baccalaureate curriculum with specialization in Cytotechnology. Cytotechnology involves the diagnosis of human disease through microscopic study of cells. The primary function of a cytotechnologist is to prepare and evaluate a variety of cellular samples for the presence of cancer and precancerous lesions. The program is accredited by the Committee on Allied Health Education and Accreditation of the American Medical Association.

Requirements for admission are the same as those for the medical technology curriculum. Admission to the University does not guarantee acceptance into the MCHV School of Cytotechnology. A separate application process for the senior year is required during the junior year. On completion of the baccalaureate program, graduates are eligible to take the national certification exam.

The minimum requirements for the first three years at the University include 20 semester hours of biological science, eight semester hours of chemistry, and three semester hours of mathematics. Students may follow the medical technology curriculum with appropriate substitutions or may satisfy the requirements through other majors. Recommended biological science courses include a combination of the following: general biology, anatomy-physiology, genetics, microbiology, histology, parasitology, cell biology, and embryology.

	1st	2nd
	SEMESTER	
FIRST YEAR		
Medical Cytology I-II Lecture	4	4
Medical Cytology I-II Lab	3	3
Cytology Seminar	2	1
Cytology Term Project	2	1
Laboratory Techniques	3	-
Cytology Practicum	-	10
	<hr/>	<hr/>
	14	19

A minimum of 33 credit hours in the senior year and a total of 127 credit hours are required for the B.S. degree.

**PHYSICAL THERAPY** The Department of Physical Therapy offers a four-year curriculum leading to a Bachelor of Science degree. In the freshman and sophomore years, students will concentrate on the necessary prerequisite courses in the humanities, sciences, and social studies. In the sophomore year, the student will begin the basic sciences of anatomy and physiology and introductory courses in Physical Therapy. The junior and senior years are devoted to the professional pro-



gram with time to further explore the humanities and social sciences required for a liberal education. During the professional program, clinical education experiences will provide the student with concurrent opportunities to apply the acquired knowledge and skills. The program of study accredited by the American Physical Therapy Association is:

	1st SEMESTER	2nd SEMESTER
<b>FIRST YEAR</b>		
Psychology 1 +	3	-
Biology 1 & 2	4	4
Chemistry	4	4
Math. (by placement)	3	-
English (by placement)+	-	3
Psych. Elective‡	-	3
Elective*	-	3
Physical Education	1	1
Medical Technology 3*	-	-
	<hr/> 15	<hr/> 18

\*Optional/Advisor  
 ‡ If Psych. 1 is taken in the first semester.  
 + First or second semester.

	1st SEMESTER	2nd SEMESTER
<b>SECOND YEAR</b>		
Mech. Engineering 93	4	-
Elec. Engineering 94	-	4
Anatomy 201	5	-
Physiology 101	-	4
Physical Therapy 41	3	-
Physical Therapy 120	-	6
Electives*	6	3
	<hr/> 18	<hr/> 17

\*Optional/Advisor

	1st SEMESTER	2nd SEMESTER
<b>THIRD YEAR</b>		
Anatomy 202	3	-
Physiology 102	4	-
Pathology 101	3	-
Physical Therapy 121-122	3	3
Physical Therapy 124	-	5
Physical Therapy 126	-	2
Physical Therapy 131-132	1	1
Physical Therapy 175*	-	2
Physical Therapy 143-144	1	2
Electives*	3	-
Statistics III	-	3
	<hr/> 18	<hr/> 18

\*Optional/Advisor

**THIRD-YEAR SUMMER PROGRAM (Mid-May-August)**  
 Physical Therapy 156 (Clinical) 3

	1st SEMESTER	2nd SEMESTER
<b>FOURTH YEAR</b>		
Physical Therapy 127	5	-
Psychology 255	3	-
Physical Therapy 133	2	-
Pharmacology 190	-	2
Physical Therapy 158	-	6
Physical Therapy 145-146	2	2
Physical Therapy 176	-	3
Electives*	3	-
	<hr/> 15	<hr/> 13

\*Optional/Advisor

A minimum of 124 credits are required for graduation, to include six credits in the humanities and 21 credits in behavioral and social sciences (including statistics and research methodology).

A minimum grade-point average of 2.0 is required for the baccalaureate degree in this curriculum. The minimum grade required in a professional course is "C." At the end of each semester and prior to each Clinical Education assignment, the faculty review the development of professional attitudes and behaviors of the majors in this program as well as the quality of their academic record.

The full-time Clinical Education Program (PT 156, PT 158) is an integral part of the curriculum offering the student opportunities to apply academic knowledge in the clinical setting. The program is widely affiliated throughout the United States but focused in the Northeast. Students affiliating will be responsible for the cost of transportation and living expenses (including room and board) during the six-week period of the junior summer and the 12-week period of the senior spring semester. All students in the program are required to carry professional liability insurance prior to enrolling in clinical education experience. Students should plan their finances to include these expenses.

The affiliations will be scheduled as indicated unless inconvenient for the clinical facilities. Students may be required to affiliate during an alternate time period if sufficient clinical facilities are not available.

**RADIOLOGIC TECHNOLOGY** The Department of Radiologic Technology offers two 24-month programs leading to the Associate in Science degree.

**Nuclear Medicine Technology Program:** Preparation for a career in working with radioactive drugs and complex equipment for diagnosing patient problems.

**Radiation Therapy Technology Program:** Preparation for a career in operating high energy radiation machines for treating cancer patients.

During the semester, students obtain direct patient care experiences at the Medical Center Hospital of Vermont (MCHV). Summertime clinical experiences are obtained at the MCHV and other hospitals throughout the region. The summer clinical experiences will require additional room, meal, transportation, and tuition expenses.

A limited number of eligible graduates of these programs may transfer to the College of Education and Social Services to complete a B.S. degree program for a teaching career in Radiologic Technology.

Registered technologists from hospital-based programs are encouraged to apply. Equivalency examinations are available in all Radiologic Technology courses and will be administered after a person matriculates.

Both programs are accredited by the American Medical Association and graduates are eligible to write the national registry examination.

Interested persons should write directly to the Department in the Rowell Building for additional information, interview, and tour of clinical facilities.

**Nuclear Medicine Technology**

	1st SEMESTER	2nd SEMESTER
<b>FIRST YEAR</b>		
Anatomy & Physiology 19-20	4	4
Math. (by placement)	3	-
Physical Education	1	-
Radiologic Tech. 1	3	-
Radiologic Tech. 31, 32	1	3
Radiologic Tech. 33, 34	1	1
English	-	3



Radiologic Tech. 4	3	-
Computer Science 3 or 11 or Statistics 11	-	3
Distribution	-	3
	16	17

<b>SUMMER SESSION</b>		
Radiologic Tech. 77	3	

<b>SECOND YEAR</b>	<b>1st</b>	<b>2nd</b>
	<b>SEMESTER</b>	
Chemistry 3	4	-
Distribution	-	3
Radiologic Tech. 131, 132	5	3
Radiologic Tech. 133, 134	3	3
Speech 11	3	-
Radiologic Tech. 138	-	2
Electives	-	2
	15	13

<b>SUMMER SESSION</b>		
Radiologic Tech. 177	3	

**Radiation Therapy Technology**

<b>FIRST YEAR</b>	<b>1st</b>	<b>2nd</b>
	<b>SEMESTER</b>	
Anatomy & Physiology 19-20	4	4
Math. (by placement)	3	-
Physical Education	-	1
Radiologic Tech. 1	3	-
Radiologic Tech. 21, 22	2	2
Radiologic Tech. 23, 24	1	1
English	-	3
Radiologic Tech. 4	3	-
Computer Science 3 or 11 or Statistics 11	-	3
	16	14

<b>SUMMER SESSION</b>		
Radiologic Tech. 77	3	

<b>SECOND YEAR</b>	<b>1st</b>	<b>2nd</b>
	<b>SEMESTER</b>	
Speech 11	3	-
Radiologic Tech. 121, 122	3	4
Radiologic Tech. 123, 124	3	3
Radiologic Tech. 125, 126	3	2
Electives	2	2
Distribution	3	3
	17	14

<b>SUMMER SESSION</b>		
Radiologic Tech. 177	3	

DISTRIBUTION (at least one three-credit course from two of the following categories).

- A. Art, film, music, theatre
- B. Classics, French, German, Greek, Latin, Russian, Spanish
- C. History, philosophy, political science, religion
- D. Anthropology, economics, geography, psychology, sociology
- E. Business Administration, education, environmental studies, forestry, human nutrition, military studies, social work

A minimum of 61 approved semester hours (not including R.T. 77) with a cumulative grade-point average of 2.0 and a grade-point average of 2.0 in Radiologic Technology courses are required for the Associate in Science degree in this curriculum. A grade of "C -" is required for both Anatomy and Physiology 19 and 20.

**CLINICAL AFFILIATIONS**

**NUCLEAR MEDICINE TECHNOLOGY**

- Albany Medical Center, Albany, NY
- Hartford Hospital, Hartford, CT
- Maine Medical Center, Portland, ME
- Mary Hitchcock Medical Center, Hanover, NH
- Medical Center Hospital of Vermont, Burlington, VT
- Winchester Memorial Hospital, Winchester, MA

**RADIATION THERAPY TECHNOLOGY**

- Eliot Hospital, Manchester, NH
- Mary Hitchcock Medical Center, Hanover, NH
- Massachusetts General Hospital, Boston, MA
- Medical Center Hospital of Vermont, Burlington, VT

Note: The above list of clinical affiliations is subject to change.

**The School of Nursing**

The School of Nursing offers two distinct educational programs to prepare qualified individuals for the practice of nursing. The Professional Nursing program is four years in length and leads to the Bachelor of Science degree. The two-year Technical Nursing program leads to the Associate in Science degree. Both programs are approved by the Vermont State Board of Nursing and accredited by the National League for Nursing, Inc.

Transfer between the two programs is possible in accord with University policy and with consent of the departments concerned.

Applicants must satisfy the general admissions requirements for the University. For the baccalaureate program, a high school year's course in chemistry and one in biology are required and one additional year of science in the senior year is highly recommended. For the Associate in Science degree program, a high school course in biology is required and chemistry is recommended.

Financial aid is available in the form of scholarships, loans, prizes, and employment (see section on Financial Aid).

The offices of the Dean of the School are located in Rowell Building.

**ORGANIZATION**

The School consists of two departments: Professional Nursing and Technical Nursing.

**DEGREE PROGRAMS**

The Bachelor of Science degree is awarded in Professional Nursing (four-year program).

The Associate in Science degree is awarded in Technical Nursing (two-year program).

**DEGREE REQUIREMENTS**

A minimum 2.0 grade-point average is required for graduation. Grades in nursing courses are based on achievement in theory and in laboratory practice, both of which must be satisfactory to receive a passing grade. Refer to departmental sections for specific policies. The School of Nursing reserves the right to require the withdrawal from nursing of any student whose health, academic record, or performance and behavior in nursing is judged unsatisfactory.

All students in the School of Nursing are required to carry professional liability insurance when enrolled in clinical nursing courses and are responsible for transportation to and from the

agencies which are used for clinical experiences. These include the Medical Center Hospital of Vermont; Birchwood Terrace Health Care; the Burlington Visiting Nurses Association, Inc.; Vermont State Hospital in Waterbury; and other selected agencies in the Burlington, Middlebury, and St. Albans areas. Seniors in the baccalaureate program are responsible for providing transportation which may be required during their participation in community health nursing experiences in the senior year.

## AREAS OF STUDY

**PROFESSIONAL NURSING** The Department of Professional Nursing offers a curriculum leading to the Bachelor of Science degree. This curriculum is designed to provide the opportunity for qualified individuals to prepare for professional practice in beginning positions in various settings, to acquire a foundation for continued formal study in nursing, and to enhance growth toward maturity as individuals, professional persons, and citizens. The graduates of this program are eligible to apply for licensure as registered nurses. They may advance without further formal education to positions which require beginning administrative skills.

The curriculum, conducted in four academic years, provides an approximate balance in general and professional education. Courses in the sciences — biological, physical, and social — serve as a foundation for the professional nursing courses.

A minimum of 127 approved semester hours is required for the Bachelor of Science degree. A grade of "C—" or better is required in Chemistry 4, Anatomy and Physiology 19-20, and Microbiology 55 and 57, and a grade of "C" or better in Professional Nursing 26, 125-126, 128, 225, 226, and 252. A grade of "C" or better will be required for Professional Nursing 25 and 251 beginning with the class of 1992.

Students are required to present evidence of current CPR certification prior to the beginning of PRNU 225 and to maintain their certification throughout PRNU 225, 226, and 252.

A typical program of studies follows:

FRESHMAN YEAR	1st	2nd
	SEMESTER	
English	3	3
Psychology 1	-	3
Chemistry 3-4	4	4
Sociology 1 or 11	3	-
Speech 11	3	-
Electives	3	6
Physical Education	1	1
	17	17

SOPHOMORE YEAR	1st	2nd
	SEMESTER	
Early Childhood & Human Development 80-81	3	3
Microbiology 55 & 57	4	-
Anatomy & Physiology 19-20	4	4
Prof. Nursing 25	2	2*
Prof. Nursing 26	-	4
Nutr. Sci. 141	-	3
Electives	3	3
	16	17

\*With permission of chairperson

JUNIOR YEAR	1st	2nd
	SEMESTER	
Prof. Nursing 125	9	-
Prof. Nursing 126	-	9

Prof. Nursing 128	-	3
Electives	6	3
	15	15
	1st	2nd
	SEMESTER	
SENIOR YEAR		
Prof. Nursing 225	9	-
Prof. Nursing 226	-	9
Prof. Nursing 251	3	-
Prof. Nursing 252	-	6
Elective	3	-
	15	15

In addition to the general educational courses found in the curriculum outline, specific courses in general education are required and additional courses are elected in accordance with individual needs and interest and in consultation with the faculty advisor. These are:

- Social Sciences — 15 credits, including:
  - Psychology 1 and Sociology 1 or 11
- Humanities and Languages — 15 credits, including:
  - English — six credits
  - Philosophy or Religion — three credits
  - Speech 11 — three credits
- General Electives — 12 credits

General electives may be chosen in an area of the student's choice. Students desiring to elect a sequence of courses in a given area, such as foreign languages or mathematics, should begin the sequence during the freshman year.

**TECHNICAL NURSING** The Department of Technical Nursing offers a curriculum leading to the Associate in Science degree. The curriculum is designed to prepare qualified individuals to give direct nursing care to patients of all age groups and to promote development of the individual as a responsible member of society. The graduates of this program are eligible to apply for licensure as registered nurses and are prepared for nursing practice in hospitals, nursing homes, and other health agencies.

The curriculum is two academic years in length. General education courses and courses related to nursing account for approximately one-half of the total required credits, and nursing courses for the remaining one-half. Nursing courses are taught concurrently with general education courses throughout the two years and include classroom instruction and guided clinical experiences in selected agencies.

A minimum of 64 approved semester hours is required for the Associate in Science degree. A grade of "C—" or better is required in Anatomy and Physiology 19-20, and a grade of "C" or better in Technical Nursing 15-16, 123-124, and 130.

At the beginning of the second year, students are required to present proof of current CPR certification.

A typical program of studies follows:

FIRST YEAR	1st	2nd
	SEMESTER	
English 1 or English Elective	-	3
Early Childhood & Human Development 80-81	3	3
Anatomy & Physiology 19-20	4	4
Nutr. Sci. 46	3	-
Tech. Nursing 15-16	6	6
Physical Education*	-	1
	16	17

	1st	2nd
	SEMESTER	
<b>SECOND YEAR</b>		
Sociology 1 or 11	3	-
Approved Elective**	3	-
Free Elective	-	3
Tech. Nursing 123-124	10	10
Tech. Nursing 130	-	2
	16	15

\*Physical Education: One credit during the two years.  
 \*\*Any social science, mathematics, or humanities course.

**ADVANCED STANDING**

The School of Nursing provides an opportunity for individuals who have had prior experience in the health field to receive advanced standing in the program to which admission is sought. Admission to the program is essentially the same as for other applicants to the University. In accord with University policy, the student may apply for credit by examination in general education and selected nursing courses.

Individuals planning to seek admission with advanced standing are urged to write to the School of Nursing for more detailed information and to arrange for a personal interview prior to applying for admission or taking courses for college credit at this or another institution.

**OPPORTUNITIES FOR LICENSED PRACTICAL NURSES**

Students who are licensed practical nurses are eligible for advanced standing in nursing. Students who have successfully challenged TENU 15-16 may complete the remaining credits (two) in the first-year nursing course during the academic year or during the summer. Advanced standing may be earned in ten of the 12 credits in TENU 15-16.

**OPPORTUNITIES FOR REGISTERED NURSES**

The advanced standing policies outlined are applicable to registered nurse students seeking a baccalaureate degree in nursing. Students may enroll in the regular full-time program or the alternate track program. The alternate track allows the registered nurse student the opportunity to complete all but one semester (spring-senior year) of the program on a part-time basis and requires completion of the program within six years of admission.

**College of Medicine**

Information on admission and curriculum may be obtained in the Bulletin of the College of Medicine which is available in the offices of the Dean in the Given Medical Building.



# The School of Natural Resources

A major goal of the School of Natural Resources is to encourage the development of leaders for the stewardship of renewable natural resources — our forests, wildlife, fish, water, and land. Academic programs provide the scientific and philosophical bases for addressing critical issues in the use of these resources for commerce, recreation, and conservation. All areas of study require a foundation in communications; arts and humanities; social and natural sciences; and mathematics, statistics, and computer science.

An Honors Program is open to qualified junior and senior students. Honors students undertake advanced studies in an environment that encourages original thought and creativity. Their projects provide valuable experience in designing, implementing, and reporting results of research.

Individual and professional responsibility, as well as scholastic excellence, are emphasized within the School's supportive atmosphere. The relationship of students and advisors is of central importance to this atmosphere. Faculty members are conscientious academic advisors and students communicate frequently with them for guidance in clarifying educational, career, and personal goals.

The School's academic programs and course scheduling are designed to accommodate transfer students and those undecided about an undergraduate major. While the School's academic programs prepare students for professional positions in natural resources, graduates are also well prepared to pursue careers or advanced study in other professions.

Classes are held in the George D. Aiken Center for Natural Resources. The Center houses innovative teaching facilities, as well as modern laboratories equipped for research in tree physiology and genetics, wildlife and fisheries biology, water resources, forest pathology, remote sensing, natural resource planning, and outdoor recreation and tourism. The School's computer facilities support sophisticated geographic mapping and information systems. Many courses in the School incorporate extensive outdoor laboratory experiences. Students also have the opportunity to participate in faculty research or independent study.

The Office of the Dean of the School is located in the George D. Aiken Center for Natural Resources.

## ORGANIZATION

The School offers academic programs in Community Forestry and Horticulture, Environmental Studies, Forestry, Natural Resources Planning, Recreation Management, Resource Economics, and Wildlife and Fisheries Biology. In addition, the Vermont Water Resources Research Center is housed within the School as is the Natural Resources Extension unit.

## DEGREE PROGRAMS

The Bachelor of Science degree is awarded for the following programs:

- Community Forestry and Horticulture
- Environmental Studies — Natural Resources
- Forestry
- Recreation Management
- Resource Economics
- Wildlife and Fisheries Biology

Students interested in studying natural resources, but who wish to postpone their decision on a specific major, enroll in *Undecided-NR*.

## DEGREE REQUIREMENTS

- A. University-wide: 120 credit hours, including two credits of physical education activities, with a cumulative grade-point average of 2.0 or above.
- B. School-wide: SNR Core, including eight courses in natural resources and ten courses in distribution requirements.
- C. Program or Major: Further requirements as specified in the following sections.

## SNR CORE CURRICULUM

The SNR core curriculum is a four-year sequence which provides a common experience for all SNR students. Its dual focus on the biological and social sciences reflects the faculty's conviction that integration and interaction of disciplines will be a key characteristic of future developments in the field of natural resources.

Nat. Res. 1, Ecological Aspects of Nat. Res. Conservation	4
Nat. Res. 40, The American Wilderness	3
Nat. Res. 25, Elementary Nat. Res. Measurements and Mapping	4
Forestry 120, Forest Ecology	4
Nat. Res. 102, Water as a Nat. Res.	3
Wildlife & Fish. Biol. 174, Principles of Wildlife Mgmt.	3
Forestry 251, Forest Policy and Admin.	3
Nat. Res. 272, Environmental Impact Assessment	3
<b>Total Credit Hours</b>	<b>27</b>

### Notes:

Transfer students with 30 or more credit hours are exempted from Nat. Res. 1.

Environmental Studies — SNR majors select a minimum of nine credits from the SNR Core Curriculum.

Community Forestry and Horticulture majors may substitute Nat. Res. 235 for Forestry 251.

## DISTRIBUTION REQUIREMENTS

To extend the student's general background, ten elective courses are required in five areas:

1. Arts and Humanities (two courses)
 

Art	Foreign language
Classics	Philosophy
English literature	Music
History	Religion
Theatre	
2. Communications (two courses, including one in English composition and one emphasizing oral communication)
3. Mathematics, Statistics, or Computer Science (two courses)
4. Natural Sciences (two courses)
 

Biology	Plant & Soil Science
Botany	125 or 161
Chemistry	Physics
Forestry 3 or 21	Zoology
Geology	
5. Social Sciences (two courses, including *either* Economics 11 or Agricultural and Resource Economics 61)
 

Anthropology	Sociology
Economics	Resource Economics
Geography	Psychology
Political Science	

Except by petition, distribution electives must be three or four credit hour courses.



**COMMUNITY FORESTRY AND HORTICULTURE**

This program integrates a broad education in natural resources with professional training in the use and care of trees, shrubs, lawn grasses, and other elements of the human environment. Landscape design and contracting, urban forestry, park supervision, and garden center management are some of the professions in this expanding field.

The major is administered jointly by the School of Natural Resources and the College of Agriculture and Life Sciences. Its curriculum is drawn primarily from the Forestry program and the Department of Plant and Soil Science.

A minimum of 122 credit hours of specified and elective courses is required for graduation. Students are encouraged to participate in internships related to their studies; these internships provide valuable work experience and professional contacts.

Forestry 176, Urban Forestry	-	3
Nat. Res. 272, Environmental Impact Assessment	-	3
Co-Op Program or Other courses <sup>2,3,4,5,6</sup>	12	9
	<hr/>	<hr/>
	15	15

- <sup>1</sup> Select either Math. 10, Precalculus or Statistics. Students not having trigonometry in high school should also take Math. 2.
- <sup>2</sup> Select either Computer Science 3, Computers and Their Applications, or Computer Science 11, Computer Programming, or Voc. Ed. & Tech. 85, Microcomputer Applications.
- <sup>3</sup> Select either Ag. and Res. Ec. 166, Small Business Management, or Business Administration 120, Principles of Management.
- <sup>4</sup> Select either Recreation Management 255, Environmental Interpretation, or Plant and Soil Science 132, Landscape Design II.
- <sup>5</sup> Select one three-credit social science course.
- <sup>6</sup> Select two three-credit arts and humanities courses.

	1st SEMESTER	2nd SEMESTER
<b>FRESHMAN YEAR</b>		
Nat. Res. 1, Ecological Aspects of Nat. Res. Conservation	4	-
Plant & Soil Sci. 7, Orientation to Community Forestry and Horticulture	1	-
English 1, Written Expression	3	-
Nat. Res. 40, American Wilderness	-	3
Botany 4, Intro. to Botany	-	4
Chemistry 3, General Chemistry	-	4
Speech 11, Effective Speaking	3	-
Physical Education Activity	1	1
Other courses <sup>1,5,6</sup>	3	3
	<hr/>	<hr/>
	15	15

	1st SEMESTER	2nd SEMESTER
<b>SOPHOMORE YEAR</b>		
Nat. Res. 25, Measurements and Mapping	4	-
Plant & Soil Sci. 161, Intro. Soil Science	4	-
Plant & Soil Sci. 125, Woody Ornamentals	4	-
Voc. Ed. & Tech. 2, General Shop	3	-
Nat. Res. 102, Water as a Natural Resource	-	3
Forestry 120, Forest Ecology	-	4
Plant & Soil Sci. 162, Soil Fertility and Mgmt.	-	3
Botany 104, Plant Physiology	-	4
Ag. and Res. Ec. 61, Principles of Agr. and Res. Ec.	3	-
Other Courses <sup>2,5,6</sup>	-	3
	<hr/>	<hr/>
	18	17

	1st SEMESTER	2nd SEMESTER
<b>JUNIOR YEAR</b>		
Wildlife & Fish. Biol. 174, Principles of Wildlife Mgmt.	3	-
Forestry 133, Forest Entomology	3	-
Plant & Soil Sci. 145, Turfgrasses	3	-
Plant & Soil Sci. 131, Landscape Design I	3	-
Forestry 134, Forest Pathology	-	4
Other Courses <sup>2,3,4,5,6</sup>	3	11
	<hr/>	<hr/>
	15	15

	1st SEMESTER	2nd SEMESTER
<b>SENIOR YEAR</b>		
Nat. Res. 235, Legal Aspects of Planning and Zoning	3	-

**ENVIRONMENTAL STUDIES**

The major in Environmental Studies is an individually-designed interdisciplinary program available to qualified students upon approval of the Director of the Environmental Program. The major requires completion of 120 credit hours, including seven required courses in Environmental Studies, three courses selected from the SNR core curriculum, ten elected distribution courses, and at least 24 credit hours of intermediate or advanced environmentally-related courses approved by the student's advisor.

Students in other natural resources majors may also elect a coordinate major in Environmental Studies. Those desiring to do so complete all requirements in their major; Environmental Studies 1, 2, 100, and 204; and at least three other intermediate or advanced environmentally-related courses chosen in consultation with an advisor from the Environmental Program.

*Environmental Studies Major*

	Credit Hours
ENVS 1, Introduction to Environmental Studies	4
ENVS 2, International Environmental Studies	4
ENVS 100, Environmental Theory	3
ENVS 151, Intermediate Environ. Studies	3
ENVS 201, Research Methods	3
ENVS 204, Seminar in Environmental Studies	3
Individually-Designed Program (24 hours of intermediate or advanced environmentally-related courses.)	24+
ENVS 202, Senior Project and Thesis Senior Thesis (research or action project or internship) planned and designed in Environmental Studies 201. Actual credit arranged in consultation with senior thesis advisor.	6+
Electives, distribution requirements, and three courses selected from SNR core	60+
Physical Education Activities	2
<b>Total Credit Hours</b>	<hr/> 120+

**FORESTRY**

The Forestry Program seeks to provide a unique and high quality educational experience for students interested in the study and wise use of forests. The objectives of the program are focused within the missions of the University and the School of Natural Resources and are: (1) to provide a stimulating and fundamentally sound education in natural resources, with an emphasis on forest ecosystem management and biology, that prepares individuals to contribute in a diverse global society; (2) to provide special opportunities for students to pursue a course of study in forest resource management which incorporates related areas of water, wildlife, and recreation leading to the first professional degree in forestry; (3) to provide some

students with an education in the biological sciences associated with forests, which incorporates sufficient academic flexibility for students to qualify for employment in a diversity of natural resource positions, to seek certification as secondary school educators in biological sciences, or to pursue other employment opportunities; and (4) to provide general forestry education for students enrolled in other natural resource disciplines and for the community at large.

The curriculum uses an integrated approach toward a broad-based undergraduate education. This is accomplished by using the extensive resources within the School of Natural Resources and the University and by emphasizing close professional faculty-student interactions, laboratory/field and employment experiences, a balance of social and natural sciences, and student involvement in ongoing research projects, internships, and leadership activities.

All majors in Forestry enroll in a common set of courses during the freshman and sophomore years. Thereafter, they pursue one of two options within the major: Forest Resource Management or Forest Biology. A nonprofessional minor in Forestry is also available.

A minimum of 126 credit hours in core and elective courses is required for the Bachelor of Science degree.

	1st	2nd
	SEMESTER	
<b>FRESHMAN YEAR</b>		
Nat. Res. 1, Ecological Aspects of Nat. Res. Conservation	4	-
Geology 1, Introductory Geology	4	-
English I, Written Expression	3	-
Math. 19, Calculus I	3	-
Nat. Res. 40, American Wilderness	-	3
Chemistry 3, General Chemistry*	-	4
Speech 11, Effective Speaking	-	3
Elective	-	4-6
Physical Education Activity	1	1
	15	15-17

\*Not required for Forest Resource Management option.

	1st	2nd
	SEMESTER	
<b>SOPHOMORE YEAR</b>		
Nat. Res. 25, Measurements and Mapping	4	-
Forestry 21, Dendrology	4	-
Biology 1, 2, Principles of Biol.*	4	4
Economics elective	-	3
Forestry 120, Forest Ecology	-	4
A course in biostatistics	-	3
Computer Science elective	-	3
Elective	3-5	-
	15-17	17

\*Forest Resource Management option requires only Biology 1.

**SUMMER FIELD PROGRAM**

Forestry 122, Forest Ecosystem Analysis 4

**Forest Resource Management Option** This option prepares students for a variety of careers in forest resource management and related areas in the public and private sectors and for graduate study. This option is accredited by the Society of American Foresters. SAF is a specialized accrediting body recognized by the Council on Postsecondary Accreditation and by the U.S. Department of Education as the accrediting body for forestry in the U.S.

	1st	2nd
	SEMESTER	
<b>JUNIOR YEAR</b>		
Forestry 123, Silviculture	4	-

Forestry 153, Forest Finance	1	-
Wildlife & Fish. Biol. 174, Principles of Wildlife Mgmt.	3	-
Forestry 146, Remote Sensing of Forest Resources	-	3
Nat. Res. 102, Water as a Nat. Res.	-	3
Electives or option requirements <sup>1,2</sup>	7-9	9-11
	15-17	15-17

	1st	2nd
	SEMESTER	
<b>SENIOR YEAR</b>		
Forestry 251, Forest Policy and Admin.	3	-
Forestry 272, Forest Mgmt.	3	-
Nat. Res. 272, Environmental Impact Assessment	-	3
Electives or option requirements <sup>1,2</sup>	8-10	12-14
	14-16	15-17
Total Credit Hours		126

**Forest Biology Option** This option offers students a stimulating natural resources education with an emphasis in forest biology and, at the same time, the disciplinary flexibility to pursue further study at the graduate level, to qualify for employment in life science subdisciplines, and to seek certification as secondary school educators in both biological and natural sciences.

	1st	2nd
	SEMESTER	
<b>JUNIOR YEAR</b>		
Forestry 123, Silviculture	4	-
Wildlife & Fish. Biol. 174, Principles of Wildlife Mgmt.	3	-
Chemistry 4 or 42, Organic Chemistry	4	-
Biology 102, Environmental Biology	4	-
Nat. Res. 102, Water as a Nat. Res.	-	3
Forestry 225, Tree Structure and Function	-	3
Electives or option requirements <sup>1,3</sup>	0-2	9-11
	15-17	15-17

	1st	2nd
	SEMESTER	
<b>SENIOR YEAR</b>		
Forestry 251, Forest Policy and Admin.	3	-
Nat. Res. 272, Environmental Impact Assessment	-	3
Electives or option requirements <sup>1,3</sup>	12-14	12-14
	15-17	15-17
Total Credit Hours		126

<sup>1</sup> To meet School requirements, students must complete two courses in the arts and humanities and one other course in the social sciences.

<sup>2</sup> Students electing the Forest Resource Management option must complete a minimum of 16 credit hours from an approved list of courses in Forestry.

<sup>3</sup> Students electing the Forest Biology option must complete a minimum of 15 credit hours from an approved list of courses in plant and animal biology.

**Forestry Minor** The minor in Forestry is designed to provide basic understanding of forest resources for students not majoring in Forestry. Applications are available from the Forestry program office and must be filed no later than June 1 of the year preceding the student's graduation. Acceptance is on a competitive, space-available basis. A minimum of 18 credit hours is required.

Required Courses:

Forestry 3, North American Trees (Forestry 21 may be substituted)

Forestry 120, Forest Ecology  
Forestry 251, Forest Policy and Administration

**Elective Courses:**

A minimum of three additional courses must be taken from the following list for a total of at least 18 credits:

Forestry 1 or 73, 122, 123, 124, 132, 133, 134, 140, 146, 153, 155, 157, 162, 163, 176, 185. Any 200-level Forestry course for which prerequisites are satisfied may be included.

**RECREATION MANAGEMENT**

All majors in Recreation Management are required to successfully complete a series of core courses during the freshman and sophomore years. Upon completion of the sophomore year, the students elect to concentrate in one of two areas: public outdoor recreation or private outdoor recreation and tourism.

These concentrations are designed to prepare students for professional careers in the management of outdoor recreation resources. The public recreation resources include parks, forests, wilderness areas, and other outdoor recreation facilities at the local, regional, state, and federal governmental levels. Private resources include ski areas, campgrounds, hunting preserves, resorts, and other specialized recreation facilities.

**Public Outdoor Recreation** The Recreation Management program's concentration in public land management prepares the student for a professional career in the planning and management of natural resources for outdoor recreation use. It combines course work from natural resource disciplines with social sciences, communications, and public administration and management.

**Private Outdoor Recreation and Tourism** This concentration is designed to prepare students for careers in private outdoor recreation and tourism enterprises. Special emphasis is given to the management of private ski areas, but the program permits specialization in several types of private recreation businesses. Course work is concentrated in natural resource management and business administration.

A minimum of 130 semester hours of required and elective courses is required for the Bachelor of Science degree. A Recreation Management minor is also available.

	1st	2nd
	SEMESTER	
<b>FRESHMAN YEAR</b>		
Nat. Res. 1, Ecological Aspects of Nat. Res. Conservation	4	-
Math. elective	3	-
Computer Science elective	-	3
English 1, Written Expression	3	-
Laboratory science elective	-	4
Nat. Res. 40, American Wilderness	-	3
Sociology or Psychology	3	-
Electives <sup>1</sup>	3	6
Physical Education Activity	1	1
	<hr/> 17	<hr/> 17

	1st	2nd
	SEMESTER	
<b>SOPHOMORE YEAR</b>		
Rec. Mgmt. 138, Park Design	4	-
Political Science 21, American Political Systems	-	3
Economics 11, 12, Principles of Econ.	3	3
Rec. Mgmt. 50, Tourism Planning	-	3
Forestry 120, Forest Ecology	-	4
Nat. Res. 25, Measurements & Mapping	4	-
English/communications elective <sup>2</sup>	3	-
Statistics elective	3	-

Electives <sup>1</sup>	-	3
	<hr/> 17	<hr/> 16

**SUMMER FIELD TRAINING**

Rec. Mgmt. 150, Rec. Mgmt.	4	
	1st	2nd
	SEMESTER	
<b>JUNIOR YEAR</b>		
Rec. Mgmt. 153, Admin. and Operations	3	-
Rec. Mgmt. 235, Outdoor Rec. Planning	3	-
Rec. Mgmt. 157, Ski Area Mgmt.	-	3
Nat. Res. 102, Water as a Nat. Res.	-	3
Wildlife & Fish. Biol. 174, Principles of Wildlife Mgmt.	-	3
Electives and concentration requirements <sup>1,3</sup>	9	6
	<hr/> 15	<hr/> 15

**SENIOR YEAR**

Rec. Mgmt. 255, Environmental Interpretation	3	-
Rec. Mgmt. 191, Practicum	3	-
Rec. Mgmt. 225, Economics of Outdoor Recreation and Tourism	-	3
Forestry 251, Forest Policy and Admin.	3	-
Rec. Mgmt. 182, Senior Seminar	-	2
Nat. Res. 272, Environmental Impact Assessment	-	3
Electives and concentration requirements <sup>1,3</sup>	6	6
	<hr/> 15	<hr/> 14
<b>Total Credit Hours</b>		130

<sup>1</sup> To meet School and program distribution requirements, students must complete at least two courses in arts and humanities and one other course in the sciences.

<sup>2</sup> A course in oral communication.

<sup>3</sup> Students take additional specified course work in either the public outdoor concentration or in the private outdoor recreation and tourism concentration. Students selecting the public concentration must complete:

- a. Two courses that apply to managing public agencies.
- b. One other course in natural resources.

Students selecting the private concentration must complete:

- a. Rec. Mgmt. 151, Food and Lodging Management
- b. Rec. Mgmt. 158, Resort Management and Marketing
- c. Business Administration 60, Financial Accounting
- d. Business Administration 120, Principles of Management
- e. Business Administration 154, Foundations of Marketing or Ag. and Res. Ec. 168, Small Business Marketing

Students in the School of Natural Resources may not take more than 25 percent of their course work in the School of Business Administration.

**Recreation Management Minor** The minor in Recreation Management requires a planned course of study which will provide a substantive introduction into the field of recreation management. Application for the minor must be completed by June 1 of the year preceding graduation or completion of the requirements for the minor. Applications may be obtained from the Recreation Management program office. Space in the minor is limited so acceptance will be on a competitive, space-available basis. A minimum of 15 semester hours of course work is required.

A minimum of nine semester hours are to be selected from the following:

- Nat. Res. 40, The American Wilderness
- Rec. Mgmt. 50, Tourism Planning

Rec. Mgmt. 138, Park Design  
 Rec. Mgmt. 150, Recreation Management  
 Rec. Mgmt. 153, Recreation Administration and Operations  
 Rec. Mgmt. 157, Ski Area Management  
 Rec. Mgmt. 158, Resort Management and Marketing

A minimum of six semester hours are to be selected from the following:

Rec. Mgmt. 225, Economics of Outdoor Recreation and Tourism  
 Rec. Mgmt. 235, Outdoor Recreation Planning  
 Rec. Mgmt. 255, Environmental Interpretation

**RESOURCE ECONOMICS**

This program deals with the application of economic theory to natural resources allocation problems. It prepares an individual to effectively use economics and conservation in achieving an efficient and equitable use of natural resources. Graduates will be prepared for positions in natural resources management and administration.

A minimum of 124 semester hours of required and elective courses is required for the Bachelor of Science degree. A Resource Economics minor is also available.

	1st	2nd
	SEMESTER	
<b>FRESHMAN YEAR</b>		
Nat. Res. 1, Ecological Aspects of Nat. Res. Conservation	4	-
Math. 19, Calculus I	3	-
Math. 20, Calculus II	-	3
Nat. Res. 40, American Wilderness	-	3
English 1 or 50, Written Expression	3	-
Speech 11, Effective Speaking	-	3
Physical Education Activity	1	1
Electives <sup>1</sup>	5	6
	<hr/>	<hr/>
	16	16

	1st	2nd
	SEMESTER	
<b>SOPHOMORE YEAR</b>		
Economics 11/12, Principles of Econ. Statistics elective	3	3
Geology I, Intro. Geology	4	-
Forestry 120, Forest Ecology	-	4
Nat. Res. 25, Measurement & Mapping	4	-
Computer Science elective	3	-
Electives <sup>1</sup>	1	6
	<hr/>	<hr/>
	15	16

	1st	2nd
	SEMESTER	
<b>JUNIOR YEAR</b>		
Resource Economics 121, Resource Economics	-	3
Economics 101, Macroeconomics	3	-
Economics 102, Microeconomics	-	3
Nat. Res. 102, Water as a Nat. Res. Wildlife & Fish. Biol. 174, Principles of Wildlife Mgmt.	3	-
Nat. Res. 143, Geobased Info. Sys.	-	3
Forestry 153, Forest Finance	1	-
Forestry 155, Forest Taxation	1	-
Forestry 157, Trade and Marketing of Forest Products	1	-
Elective <sup>1</sup>	6	3
	<hr/>	<hr/>
	15	15

	1st	2nd
	SEMESTER	
<b>SENIOR YEAR</b>		
Resource Economics 222, Nat. Res. Evaluation	-	3
Rec. Mgmt. 225, Economics of Outdoor Recreation	-	3
Forestry 251, Forest Policy and Admin.	3	-
Economics 265, Urban and Regional Ec.	-	3
Nat. Res. 272, Environmental Impact Assessment	-	3
Nat. Res. 254, Advanced Nat. Res. Policy	3	-
Nat. Res. 235, Legal Aspects of Planning and Zoning	3	-
Civil Engr. 125, Engr. Economy	3	-
Electives <sup>1</sup>	3	3
	<hr/>	<hr/>
	15	15
<b>Total Credit Hours</b>		124

<sup>1</sup> To meet School and program distribution requirements, students must complete two courses in the arts and humanities, one course in political science, sociology, psychology or geography, and one other course in science.

**Resource Economics Minor** The minor in Resource Economics is designed to provide students with a basic understanding of the role of economics in the allocation and use of natural resources. This minor is appropriate for anyone concerned with natural resources, especially those pursuing careers in fields that use large quantities of natural resources or whose production processes adversely impact the environment. Applications for the minor in Resource Economics are available from the Resource Economics program office and must be filed by June 1 of the year preceding graduation. Space in the minor is limited so acceptance will be on a competitive, space-available basis. Students must successfully complete a minimum of 15 semester hours in required and elective courses. Prerequisites for selected courses must be met.

**Required Courses:**

Res. Ec. 121, Resource Economics  
 Environ. St. 291, Environmental Economics  
 Nat. Res. 272, Environmental Impact Assessment

**Elective Courses:**

Res. Ec. 222, Forestry 251, Nat. Res. 143, 235, Civil Engr. 125, Wildlife and Fish. Biol. 174, Geography 3, Ag. and Res. Ec. 61, 162, 180, 264, Economics 102. Special elective (students may select a course, with the approval of the advisor, that meets special interest needs).

**WILDLIFE AND FISHERIES BIOLOGY**

This program prepares individuals for professional careers requiring expertise in wildlife and fisheries biology and ecology. Courses elected within this program meet the standards of The Wildlife Society for professional certification and satisfy educational requirements of the U.S. Office of Personnel Management as well as most state agencies for entrance grades in wildlife or fisheries positions.

All majors in Wildlife and Fisheries Biology complete the same core of courses during the freshman year. As sophomores, students elect one of three options within the major: wildlife management, wildlife biology, or fisheries biology. These options can lead to traditional positions in wildlife or fisheries management, graduate study in wildlife or fisheries science, or other positions in wildlife or fisheries biology.

Completion of 127 semester hours of specified and elective courses is required for the Bachelor of Science degree. A minor in Wildlife Biology also is available.

	1st	2nd
FRESHMAN YEAR	SEMESTER	
Biology 1, 2, Principles of Biology	4	4
Chemistry 3, 4 or 42, Intro. Chem.	4	4
Nat. Res. 1, Ecological Aspects of Nat. Res. Conservation	4	-
Nat. Res. 40, American Wilderness	-	3
Math. 19, Calculus I <sup>1</sup>	3	-
English 1 or 50, Written Expression	-	3
Physical Education Activity	1	1
	<hr/> 16	<hr/> 15

**Wildlife Management Option**

	1st	2nd
SOPHOMORE YEAR	SEMESTER	
Nat. Res. 25, Measurement & Mapping	4	-
Forestry 21, Dendrology	4	-
Plant & Soil Sci. 161, Intro. Soil Sci.	4	-
Statistics 141, Basic Methods	3	-
Forestry 120, Forest Ecology	-	4
Wildlife & Fish. Biol. 130, Ornithology	-	3
Speech 11, Effective Speaking	-	3
Electives <sup>2</sup>	-	6
	<hr/> 15	<hr/> 16

	1st	2nd
SUMMER PROGRAM	SEMESTER	
Wildlife & Fish. Biol. 131, Field Ornithology	2	
Wildlife & Fish. Biol. 150, Wildlife Habitat and Population Measurements	2	

	1st	2nd
JUNIOR YEAR	SEMESTER	
Wildlife & Fish. Biol. 174, Principles of Wildlife Mgmt.	3	-
Nat. Res. 102, Water as a Nat. Res.	-	3
Botany 109, Plant Taxonomy	4	-
Two courses from Forestry 123, 132, 146	0-4	3-6
Zoology 217 or 219, Mammalogy or Comparative Anatomy	0-4	0-4
Forestry 140, Forest Biometry	-	4
Quantitative methods <sup>3</sup>	-	3
Electives <sup>2</sup>	0-6	0-3
	<hr/> 16	<hr/> 18

	1st	2nd
SENIOR YEAR	SEMESTER	
Wildlife & Fish. Biol. 161, Fisheries Biology	4	-
Wildlife & Fish. Biol. 251, Wildlife Habitat and Population Analysis	-	3
Wildlife & Fish. Biol. 271/272, Wetlands Ecology	4	-
Wildlife & Fish. Biol. 273/274, Uplands Wildlife Ecology	-	4
Forestry 251, Forest Policy and Admin.	3	-
Nat. Res. 272, Environmental Impact Assessment	-	3
Electives <sup>2</sup>	6	6
	<hr/> 17	<hr/> 16
Total Credit Hours		127

**Wildlife Biology Option**

	1st	2nd
SOPHOMORE YEAR	SEMESTER	
Nat. Res. 25, Measurements & Mapping	4	-
Forestry 21, Dendrology, or Botany 109, Plant Taxonomy	4	-

Plant & Soil Sci. 161: Intro. to Soil Sci., or Geology I, Intro. Geology	4	-
Statistics 141, Basic Methods	3	-
Forestry 120, Forest Ecology	-	4
Wildlife & Fish. Biol. 130, Ornithology	-	3
Speech 11, Effective Speaking	-	3
Electives <sup>2</sup>	-	6
	<hr/> 15	<hr/> 16

	1st	2nd
SUMMER PROGRAM	SEMESTER	
Wildlife & Fish. Biol. 131, Field Ornithology	2	
Wildlife & Fish. Biol. 150, Wildlife Habitat and Population Measurements	2	

	1st	2nd
JUNIOR YEAR	SEMESTER	
Wildlife & Fish. Biol. 174, Principles of Wildlife Mgmt.	3	-
Wildlife & Fish. Biol. 161, Fisheries Biology	4	-
Nat. Res. 102, Water as a Nat. Res.	-	3
Wildlife & Fish. Biol. 275, Wildlife Behavior	3	-
Electives <sup>2,4</sup>	6	12
	<hr/> 16	<hr/> 15

	1st	2nd
SENIOR YEAR	SEMESTER	
Wildlife & Fish. Biol. 271/272 or 273/274 or 165	0-4	0-4
Forestry 251, Forest Policy and Admin.	3	-
Nat. Res. 272, Environmental Impact Assessment	-	3
Wildlife & Fish. Biol. 251, Wildlife Habitat & Population Analysis	-	3
Electives <sup>2,4</sup>	8	5
	<hr/> 15	<hr/> 15
Total Credit Hours		127

**Fisheries Biology Option**

	1st	2nd
SOPHOMORE YEAR	SEMESTER	
Nat. Res. 25, Measurements & Mapping	4	-
Statistics 141, Basic Methods	-	3
Plant & Soil Sci. 161, Intro. to Soil Sci.	4	-
Biol. 103, Cell Structure and Function	4	-
Forestry 120, Forest Ecology	-	4
Zoology 104, Comparative Structure and Function	4	-
Speech 11, Effective Speaking	-	3
Electives <sup>2</sup>	-	6
	<hr/> 16	<hr/> 16

	1st	2nd
JUNIOR YEAR	SEMESTER	
Wildlife & Fish. Biol. 174, Principles of Wildlife Mgmt.	3	-
Wildlife & Fish. Biol. 161, Fisheries Biology	4	-
Biol. 102, Environmental Biology or Biol. 203, Population Ecology	0-4	0-3
Nat. Res. 102, Water as a Nat. Res.	-	3
Zoology 236, Limnology	4	-
Wildlife & Fish. Biol. 232, Ichthyology	-	3
Quantitative methods <sup>3</sup>	-	3
Electives <sup>2</sup>	0-3	3-6
	<hr/> 14-15	<hr/> 15

SENIOR YEAR	1st SEMESTER	2nd SEMESTER
Wildlife & Fish. Biol. 271/272, Wetlands Ecology	4	-
Zoology 237, Ecology of Running Water	-	4
Nat. Res. 278, Water Resource Principles	-	3
Forestry 251, Forest Policy and Admin.	3	-
Nat. Res. 272, Environmental Impact Assessment	-	3
Electives <sup>2</sup>	9	6
	16	16
Total Credit Hours		127

<sup>1</sup> Qualified students may substitute higher math; those not qualified for Math. 19 will take Math. 10 in the fall semester followed by Math. 19 in the spring semester.

<sup>2</sup> To meet School and program requirements, students must complete two additional courses in communication from an approved list, two courses in the arts and humanities, and two courses in the social sciences, including Economics 11 or Agricultural and Resource Economics 61.

<sup>3</sup> Students in the Wildlife Management and Fisheries Biology Options must complete a quantitative methods course (three hours) from an approved list.

<sup>4</sup> Wildlife Biology Option students must take an additional 15 hours of biological science courses from an approved list.

**Wildlife Biology Minor** The minor in Wildlife Biology requires a planned course of study that will provide a basic understanding of wildlife resources and wildlife management. Applications for the minor must be filed no later than June 1 of the year preceding graduation or completion of the requirements for the minor. A minimum of 15 hours of credit is required in prescribed and elective courses.

**Required Courses:**

Wildlife and Fish. Biol. 130, Ornithology  
 Wildlife and Fish. Biol. 174, Principles and Practices of Wildlife Management  
 Wildlife and Fish. Biol. 271, Wetlands Ecology and Marsh Management

OR

Wildlife and Fish. Biol. 273, Uplands Wildlife Ecology

**Elective Courses:**

Wildlife and Fish. Biol. 131, 150, 165, 176, 185, 251, 271 or 273, 272, 274, 275, 281, 285.

**UNDECIDED — NATURAL RESOURCES**

High school seniors who do not wish to decide among the various programs in the School are admitted as "Undecided-NR" majors and may remain in this category a maximum of two years. These students and their advisors develop a one- or two-year curriculum which enables them to explore several fields of natural resources before committing to a specific major.

$$D^2 =$$

$$\frac{(\bar{X} - \bar{X}_0)^2}{\sigma^2}$$

$$\hat{P}_{\text{opt}} = \Phi\left(\frac{\bar{X} - \bar{X}_0}{\sigma/\sqrt{n}}\right)$$

BIASED.

~~Summary~~

~~Key Summary~~

~~Waste~~

11



# Courses of Instruction

The University reserves the right to change course offerings at any time.

The departments and areas of instruction are arranged alphabetically, and the college/school in which each is located is indicated.

A student who lacks the stated prerequisites for a course may be permitted to enroll by the instructor. Such students must inform the instructor that they lack the prerequisites, and the instructor will make appropriate efforts to ascertain that they are properly qualified.

Courses are divided into three levels: introductory, intermediate, and advanced. Where appropriate, a department may limit enrollment in a particular course. Such limitations, other than class size, must be explicitly stated.

Courses numbered from 1-99 are introductory courses. Introductory courses emphasize basic concepts of the discipline. In general, they presuppose no previous college work in the subject. The only exceptions to this rule are those cases in which there is a two-semester introductory sequence. In such cases, the second semester course may have the first semester course as a prerequisite.

Courses numbered from 100-199 are intermediate courses. An intermediate course covers more advanced material than that treated in introductory courses. Students will be expected to be familiar with the basic concepts of the subject and the course will present more difficult ideas. Intermediate courses will generally be more specialized than introductory courses. An intermediate course will always have a minimum prerequisite of three hours prior study in the discipline or in another specified discipline.

Courses numbered from 200-299 are advanced courses. An advanced course presents concepts, results, or arguments which are only accessible to students who have taken courses in the discipline (or, occasionally, in a related discipline) at the introductory and intermediate levels. Prior acquaintance with the basic concepts of the subject and with some special areas of the subject will be assumed. An advanced course will always have a minimum prerequisite of three hours prior study at the intermediate level in the discipline, or in a related discipline, or some specified equivalent preparation.

Some, *but not all*, 200-level courses carry graduate credit. Graduate students *must* refer to the UVM Graduate Catalogue which lists all courses carrying graduate credit. Seniors who wish to take a course for graduate credit must receive permission through the office of their dean (see page 36) prior to enrolling in the course.

Some departments make further subdivisions of courses at some levels. Where this applies, an explanation can be found at the beginning of the department's list of courses.

Two numerals separated by a comma (as in 17, 18) indicate that the separate semester courses may be taken independently for credit. Two numerals separated by a hyphen (as in 17-18) indicate that the semester courses may not be taken independently for credit, and, unless otherwise stated, they must be taken in the sequence indicated. In cases where two numerals are separated *either* by a comma *or* by a hyphen, the odd-numbered course will be taught in the fall and the even-numbered course in the spring.

The number of credit hours per semester is stated in each course description. For some courses, the course title is followed by a pair of numerals connected by a hyphen and enclosed in parentheses (as in (2-3)); this form indicates the number of class hours respectively of lecture and laboratory.

## Aerospace Studies (ASTU)

AT ST. MICHAEL'S COLLEGE (655-2000, ext. 2554)

*Professor Haun (Chairperson); Assistant Professors Mather, O'Brien.*

**101-103 U.S. Air Force Today (1-1)** The Air Force in the contemporary world; U.S. military force structure, strategic offensive and defensive forces, general purpose forces, and aerospace support forces. Leadership laboratory activities. For freshmen and sophomores in four-year program. One hour.

**201-203 History of Early Aviation and Air Power in the Space Age (1-1)** Air power from balloons and dirigibles through jet age; historical review of air power employment in military and nonmilitary operations supporting national objectives; evolution of air power concepts and doctrine. Leadership lab activities. Open to freshmen and sophomores in four-year program. One hour.

**301-303 Air Force Management and Leadership (3-1)** Integrated management course emphasizing individual motivational and behavioral processes, leadership, communication, and group dynamics providing foundation for junior Air Force officer's professional skills. Actual Air Force cases examined. Leadership lab activities. Three hours.

**401-403 National Security Forces in Contemporary American Society (3-1)** U.S. national security policy. Formulation, organization, implementation, and context of national security; evolution of strategy; management of conflict; civil-military interaction. Military professional/officership and military justice system. Leadership lab activities. Open to AFROTC contract cadets. Three hours.

## Agricultural and Resource Economics (AREC)

COLLEGE OF AGRICULTURE AND LIFE SCIENCES

*Associate Professors Fife, Gilbert, Pelsue (Chairperson), Schmidt; Assistant Professors Bancroft, Ford; Extension Professor Bevins; Extension Associate Professor Bigalow; Extension Assistant Professors Condon, Wackemagel; Adjunct Lecturer Silver.*

### PROGRAM IN AGRICULTURAL ECONOMICS

**2 World Food, Population, and Development** Agricultural development emphasizing natural and economic phenomena and the effect of food supplies on population trends and policies. Three hours. Ford.

**61 Principles of Agricultural and Resource Economics** Introduction to principles of economics through the analysis of problems of agricultural production and resource development. Three hours. Bancroft, Gilbert.

**151 Food and Lodging Management** The art and science of innkeeping and food service management. Practical business management problem solving using the personal computer. *Prerequisite:* Sophomore standing. Three hours. Bevins. Alternate years, 1988-89.

**162 Land Economics Issues** Analysis of economic, political, social, and legal institutions determining land use and development. Case studies in regional and state land use problems. *Prerequisite:* 61 or equivalent. Three hours.

**166 Small Business Management** Introduction to the theory and practice of organizing and operating a small busi-

ness. Emphasis on basic concepts in financing, accounting, legal arrangements, regulations, taxes, and decision making. *Prerequisite:* Sophomore standing. Three hours. Fife.

**167 Small Business Finance** Capital requirements of small business, financial analysis, capital budgeting, and types and sources of credit. *Prerequisites:* 61 or Economics 12, 166. Three hours. Bancroft.

**168 Small Business Marketing** Essentials of marketing for the small business firm. The course focuses on the fundamental criteria guiding small business marketing decisions. *Prerequisite:* 61 or Economics 12. Three hours. Condon.

**171 Agriculture in Economic Development** Role of agriculture in development of less-developed countries. Discussion of alternative economic development models. *Prerequisites:* 2, 61 or Economics 12. Three hours. Ford.

**175 Farm Credit Fellowship Practicum/Seminar** A program to acquaint students with financial intermediaries serving agriculture. For students with a strong interest in farm management and farm finance. *Prerequisites:* 167, 201, junior standing, and permission of instructor. Three hours. Bancroft.

**177 Small Scale Farming** Economics of producing and marketing agricultural commodities on small farms. Analyze resource use, enterprise combinations, credit, taxes, management, and marketing alternatives. *Prerequisites:* 61 or Economics 12. Three hours. Pelsue. Alternate years.

**180 Real Estate Appraisal** Gain understanding of basic concepts and methods of measuring real estate values. *Prerequisites:* 61 or Economics 12, or permission of instructor. Three hours. Silver.

**191, 192 Practicum in Agricultural and Resource Economics** Planned, supervised, off-campus education during semester, academic year, or summer. Student will be graded satisfactory or unsatisfactory. *Prerequisites:* Junior standing, departmental permission. One to 12 hours.

**195,196 Special Topics in Agricultural Economics** Readings and discussion of selected topics in agricultural economics. *Prerequisite:* Departmental permission. Credit as arranged.

**197, 198 Undergraduate Research** Work on a research problem under direction of a staff member. Findings submitted in written form as prescribed by department. *Prerequisite:* Senior standing. Three hours.

**201 Farm Business Management** Organization and operation of successful farm businesses emphasizing resource allocation, production efficiency, and marginal analysis. Field trips required. *Prerequisites:* 61 or Economics 12, 167, or permission of instructor; junior standing. Three hours. Bancroft.

**205 Rural Communities in Modern Society** (See Sociology 205.)

**207 Markets, Food, and Consumers** Learn how producers, processors, wholesalers, cooperatives, retailers, consumers, and governments affect the movement of food and fiber products through the production-marketing chain. *Prerequisite:* 61 or equivalent. Three hours. Pelsue.

**208 Agricultural and Food Policy** History and institutional development of agricultural policy. Price and income problems of American agriculture and alternative solutions. *Prerequisite:* 61 or Economics 12. Three hours. Schmidt.

**210 Marketing Institutions** Through guest lectures and field trips, students will meet and learn from owners and managers of food/fiber production, processing, marketing, and financial firms. *Pre- or corequisite:* 168 or 207. Two hours. Condon.

**211 Summer Experience in Agribusiness Management** A work-study program to introduce students to agribusiness. Involves working at a firm four days, classroom instruction and other appropriate activities on the fifth day. *Prerequisites:* 166, 167, or equivalent; junior standing; permission of department. Four hours. Bancroft.

**218 Community Organization and Development** (See Sociology 207.)

**254 Advanced Agricultural Economics** The structure of competitive markets; emphasis on allocation of resources and the theory of price determination. *Prerequisites:* 61 or Economics 12, Math. 19, or permission of instructor. Three hours. Bancroft.

**255, 256 Special Topics in Agricultural and Resource Economics** Readings and discussion of selected topics in economics, including those not encompassed in regular course offerings at an advanced level. *Prerequisite:* Departmental permission. Credit as arranged.

**264 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. *Prerequisites:* 61 or Economics 12, Math. 19, or permission of instructor; Vocational Education and Technology 85 and Statistics 141 helpful. Three hours. Condon.

**266 Small Business Decision Making** Applying economic concepts to decision making in the small business. Incremental analysis, contribution margins, personnel management, and linear programming will be covered. *Prerequisites:* 166, 167, or equivalent. Three hours. Fife.

**267 Small Business Planning** Instruction and guidance in the actual process of preparing a business plan. Students will prepare their own business plan including a market analysis; and legal, financial, and operational plans. *Prerequisites:* Senior standing, 266, Vocational Education and Technology 85, or equivalent. Four hours. Fife, Bancroft, Bevins.

**272 Seminar on World Food Problems and Policies** Review of recent books and periodical literature; discussion and written or oral reports on topics of contemporary interest. *Prerequisites:* Junior standing, permission of instructor. Three hours. Ford.

**273 Agricultural Planning and Project Development** Agricultural sector planning and project development processes with a focus on policy instruments; links between agriculture and the rest of the economy; data requirements; and activity preparation, evaluation, and implementation. *Prerequisite:* 171 or permission of instructor. Three hours. Ford.

#### PROGRAM IN RESOURCE ECONOMICS

(For descriptions of the following courses, refer to Recreation Management, page 171, and Resource Economics, page 172.)

**121 Resource Economics**

**157 Ski Area Management**

**222 Natural Resources Evaluation**

**225 Economics of Outdoor Recreation and Tourism**

**233 Rural Planning**

**287 Spatial Analysis** (See Geography 287.)

## Agricultural Biochemistry (AGBI)

### COLLEGE OF AGRICULTURE AND LIFE SCIENCES

*Professors Racusen, Weller; Associate Professors Currier, Tyzbir (Chairperson); Research Associate Professor Kent.*

**10 Introductory Biochemistry (3)** The biochemical substances and reactions that control important living processes. A direct introduction to biochemistry not requiring preparation in the sciences. Three hours. Racusen.

**191 Biochemistry of Nucleic Acids (2)** Structure, function, and properties of nucleic acids, nucleoproteins, and enzymes or proteins that act on nucleic acids. Emphasis on experimental approach. *Prerequisite:* 10 or equivalent or permission of instructor. Two hours. Weller.

**195 Special Topics** *Prerequisite:* Permission of instructor.

**197, 198 Undergraduate Research** *Prerequisite:* Departmental permission. One to three hours.

**201 General Biochemistry (3-3)** Broad coverage of biochemistry including principles of analytical biochemistry. *Prerequisite:* Chemistry 42 or 141. Three hours and lab (one hour) as AGBI 202. Racusen.

**202 General Biochemistry Laboratory (0-3)** Introduction to techniques and equipment used for the isolation and quantitative analysis of amino acids, proteins, sugars, and enzymes in biological materials. *Prerequisite:* Credit for or concurrent enrollment in 201. One hour. White.

**206 Introduction to Biotechnology (3)** Application of contemporary knowledge of microbiology, biochemistry, and genetics for the production of new articles of economic importance in agriculture, industry, and medicine. *Prerequisite:* Introductory college level courses in biochemistry, microbiology, chemistry, and mathematics. Three hours.

**210 Quantitative Biochemistry (3)** Study of the physical principles of biochemistry, methods and theory, with strong emphasis on problem solving and data analysis. Three hours. *Prerequisite:* 201. Kent.

**220 Molecular Biology (3-3)** Structure and biological function of nucleic acids, proteins, and enzymes. Emphasis on optical, electrophoretic, and ultracentrifugal methods. *Prerequisite:* 201 and 202 or permission of instructor. Three hours and lab (one hour) as AGBI 221. Weller.

**221 Molecular Biology Laboratory (0-3)** Laboratory practice in protein characterization by disc and SDS-gel electrophoresis and gel isoelectric focusing. DNA separation and characterization by agarose gel electrophoresis and restriction enzyme digestion. *Prerequisite:* Credit for or concurrent enrollment in 220. One hour. Currier, Weller.

**230 Advanced Biochemistry (3-3)** Study of metabolic cycles emphasizing research methods involving radioisotopes and chromatography. *Prerequisite:* 201 and 202 or 220 and 221 or permission of instructor. Three hours and lab (one hour) as AGBI 231. Currier.

**231 Advanced Biochemistry Laboratory (0-3)** Laboratory experimentation emphasizing absorption, ion exchange, affinity, and partition chromatography. Introduction to modern GLC and HPLC techniques and enzyme isolation, purification and characterization. *Prerequisite:* Credit for or concurrent enrollment in 230. One hour. Currier.

**250 Plant Biochemistry (2)** Study of specific biochemical principles unique to plants concentrating on the biochemistry of plant cell walls, photosynthesis, and secondary metabolites. *Prerequisite:* 201. Two hours. Currier.

**295 Special Topics** *Prerequisite:* Permission of instructor.

## **Anatomy and Neurobiology (ANPS; ANNB)**

### COLLEGE OF MEDICINE

*Professors Parsons (Chairperson), Young; Associate Professors Ariano, Fiekers, Freedman, Powers, Wells; Assistant Professors Combrooks, Forehand; Lecturers Ezerman, Fonda, Lee.*

**19-20 Undergraduate Human Anatomy and Physiology.** A two-semester course with credit given only upon completion of both semesters. Structure and function of human body emphasizing properties of cells, organ systems, and their interrelationships in health and disease. Topographic anatomy using cadaver prosections, histological examination of human tissue, and physiological experiments demonstrating

function of different systems. Required for all two-year Allied Health programs, two- and four-year Nursing students, and open to other University undergraduate students. *Prerequisite:* 19 for 20. Four hours. Alpert, Parsons.

**197, 198 Undergraduate Research** Individual laboratory research under guidance of faculty member. *Prerequisite:* Departmental permission. Three or six hours.

**201 Human Gross Anatomy (3-6)** Lectures and detailed regional dissections emphasize functional anatomy of major systems (e.g. musculoskeletal, cardiovascular, nervous). Required for Physical Therapy students; others upon departmental permission. Five hours.

**202 Neuroanatomy (2-3)** Structural basis of nervous system function, including spinal reflex organization, detailed analysis of sensory and motor systems, clinical examples, human brain dissection. Includes histology of selected tissues and organs. Required for Physical Therapy students; others upon departmental permission. Three hours. Wells.

## **Animal Sciences (ASCI)**

### COLLEGE OF AGRICULTURE AND LIFE SCIENCES

*Professors Atherton, Bull (Chairperson), Carew, Duthie, Foss, A. Smith, Welch; Assistant Professors C. Donnelly, Gilmore, Kindstedt, Pell; Lecturer Murray; Extension Professor Gibson; Extension Associate Professor Wildman; Research Professor Pankey; Research Associate Professor Kunkel; Research Assistant Professor Lyng; Adjunct Professors Hfieh, Randy, P. Smith, Thomas; Adjunct Assistant Professors S. Donnelly, Heintz, Poos-Floyd.*

**1 Introductory Animal Science (3-3)** Fundamental principles of food processing and anatomy, physiology, nutrition, breeding, and management of animal species important in our agricultural economy. Four hours. Welch.

**2 Introduction to Dairy Production (3-3)** Introduction to dairy industry, including producer concerns such as genetics, selection, feeding, reproduction, lactation, health disorders, and general management. Four hours. Gilmore.

**3 Introductory Dairy Foods (2-3)** Basic information on dairy foods and application of this information in laboratory exercises. Three hours. Duthie.

**4 Dairy Cattle Judging (2)** Principles of dairy cattle judging demonstrated and practiced using live animals. Two hours. Gilmore.

**43 Fundamentals of Nutrition I, II** Comprehensive study of specific nutrients in terms of their availability, function, and utilization in mammalian species. *Prerequisites:* High school chemistry and biology. Three hours. Carew.

**102 Dairy Testing and Quality Control (2-3)** Composition and properties of milk products. Standard methods of bacteriological and chemical analysis and their significance in product quality. Three hours. Atherton. Alternate years, 1989-90.

**103 Processing Fluid Dairy Foods (2-3)** Principles and processes involved in receiving, processing, and packaging fluid milk products. *Prerequisite:* 3. Three hours. Kindstedt. Alternate years, 1989-90.

**104 Sensory Evaluation of Dairy Foods (1-4)** Taste and odor as basic components of flavor, sensory tests for consumer acceptance studies, and practical training in flavor identification. Three hours. Duthie. Alternate years, 1989-90.

**106 Processing Frozen Dairy Foods (2-3)** Fundamentals of ice cream manufacture: raw material selection, handling, and processing. Ice cream mix formulation, freezing, and freezing equipment. *Prerequisites:* 3, 103. Three hours. Kindstedt. Alternate years, 1989-90.

**110 Principles of Animal Feeding (3-3)** Principles of meeting the nutrient requirements of animals, especially as they relate to the practical problems of formulation and production systems. *Prerequisite:* 43. Four hours. Pell.

**111 Animal Anatomy (3-3)** Dissection of domestic animals, demonstrations, gross and microscopic structure of organ systems of the mammalian body emphasizing farm animals. *Prerequisite:* A biology course. Four hours. Murray.

**112 Animal Health (3-3)** Fundamentals of health and disease prevention in domestic animals. Special disease problems in cattle and horses emphasizing control measures. *Prerequisite:* A biology course. Four hours. Murray.

**113 Livestock Production (2-3)** Organization and operation of livestock enterprises. Theory and application of feeding, breeding, and management, programs and principles. *Prerequisite:* 110. Three hours. Alternate years, 1989-90.

**114 Wildlife Diseases (3)** Common diseases and parasitic problems of large game animals, small fur-bearing animals, waterfowl, and game birds. Autopsy techniques and diagnostic laboratory procedures. *Prerequisites:* Two courses in biology or zoology. Three hours. Not offered 1989-90.

**115, 116 Light Horse Production and Management (2-3)** The problems of light horse production. Application of the principles of selection, management, and horsemanship, using UVM Morgan Horse Farm. *Prerequisites:* 115 for 116; junior standing. Three hours. P. Smith.

**120 General Physiology** A lecture/discussion course designed for the student to learn functions of organ systems in mammals. *Prerequisites:* Courses in anatomy, chemistry, and biology. Four hours. Foss.

**131 Practical Equine Management: Showmanship and Training** In-depth introduction to horse training techniques combined with enhancing riding skills through instructor and self-evaluation. Taught at Miner Institute, Chazy, NY. *Prerequisites:* 1, 115, 116 or permission of instructor. Eight hours in summer. P. Smith.

**132 Career Skills for the Equine Industry** A skills development course focusing on communication and laboratory skills important for jobs in equine medicine, research, and teaching. Taught at Miner Institute, Chazy, NY. *Prerequisites:* 1, 115, 116 or permission of instructor. Four hours. P. Smith.

**197, 198 Undergraduate Research** Research activity under direction of qualified staff member. Must have faculty member approval. Written proposal and report required. *Prerequisites:* Junior standing, departmental chairman permission. One to three hours.

**201 Fermented Dairy Foods (3-3)** Fundamental processes involved in the manufacture of economically important cheese varieties and other cultured dairy foods. Acquired knowledge of manufacturing procedures applied at pilot plant level. *Prerequisites:* 3; junior standing. Four hours. Kindstedt. Alternate years, 1990-91.

**202 Dairy Industry Managerial Training (3)** Select topics dealing with the organization and management of modern dairy foods processing plants. *Prerequisites:* 101, 102, 103, 104, 201. Three hours. Atherton. Alternate years, 1990-91.

**203 Food Microbiology (3-3)** Desirable and undesirable activities of bacteria in foods. Mechanisms of food-borne infection and intoxication. Laboratory methods to enumerate and identify microorganisms associated with food. *Prerequisites:* Microbiology 55, 57; a course in biochemistry. Four hours. C. Donnelly.

**211 Summer Experience in Farm Management (30 hr/wk)** A work-study program to introduce students to the modern practices associated with farm management. Taught at Miner Institute, Chazy, NY. For students who have a strong interest in farm management. *Prerequisites:* Junior, senior, or graduate standing; departmental permission. Four hours. Wildman. (Not offered for graduate credit.)

**212 Animal Breeding (4)** Principles of quantitative and statistical genetics studied in relation to animal breeding. Methods of selection and schemes of mating discussed. *Prerequisites:* An introductory course in genetics, Statistics 141 or instructor permission. Four hours. Gilmore. Alternate years, 1990-91.

**213, 214 Dairy Herd Management (2-3)** Organization and management of the dairy herd. Practical application of feeding, reproduction, milking, and general management principles. *Prerequisites:* 110; junior standing; 213 for 214. Four hours. Gibson.

**215 Physiology of Reproduction (2-3)** Fundamental principles of the physiology of reproduction with emphasis on, but not limited to, farm animals. Three hours.

**216 Endocrinology (3-3)** Anatomy, physiology, glandular interrelationships, and assay methods of the endocrine glands and their hormones. *Prerequisite:* Instructor permission. Four hours.

**242 Advanced Nutrition** (See Nutritional Sciences 242.) Three hours. Tyzbir.

**245 Nutritional Biochemistry** (See Nutritional Sciences 245.) Three hours. Tyzbir.

**249 Nutrition Seminar** (See Nutritional Sciences 249.) Two hours. Schlenker, Tyzbir.

**281 Animal Sciences Senior Seminar** Reports and discussions of problems and special investigations in selected fields. One hour. Atherton, Bull.

**282 Animal Sciences Graduate Seminar** Reports and discussions of problems and special investigations in selected fields. One to three hours. Pankey.

**294 History of Nutrition** (See Nutritional Sciences 294.) One hour.

**297, 298 Special Problems in Animal Sciences** Research and field experience activity under direction of faculty member whose approval has been given. Written proposal and report required. *Prerequisite:* Departmental chairperson permission. May enroll more than once for maximum of 15 hours.

## Anthropology (ANTH)

### COLLEGE OF ARTS AND SCIENCES

*Professors Haviland, Mitchell; Associate Professors R. Gordon, C. Pastner, S. Pastner, Power (Chairperson), Woolfson; Research Associate Professor Thomas.*

**21 Human Cultures** Introduction to cultural anthropology focusing on the life ways of non-Western societies and how anthropologists study them. Three hours.

**24 Prehistoric Archaeology** Examination of the origins and development of culture from the earliest human fossils through the appearance of civilization; the nature of archaeological data and interpretations. Three hours. Power.

**26 Physical Anthropology** Introduction to the study of the evolution and racial differentiation of humanity. Three hours. Haviland.

**28 Language in Culture** Introduction to the anthropological study of language with special focus on language and communication as they pertain to how we became human, and what makes us human. Three hours. Woolfson.

**60 Indians of the Northeast: Vermont** Vermont's native peoples from their earliest appearance in the region until today. Archaeological and ethnographic data reviewed in the broader perspective of aboriginal northeastern culture history. Three hours. Haviland, Power. Alternate years.

**101 Anthropology of Third World Development** A survey of the role of applied anthropology in the understand-

ding and analysis of development efforts to alleviate (mostly) third world problems. *Prerequisite:* 21. Three hours. Gordon.

**160 North American Indians** Ethnographic survey of major native American cultures of Mesoamerica and the U.S. against background of aboriginal culture history, and problems of contact with European cultures. *Prerequisite:* 21. Three hours. Haviland. Alternate years.

**161 Cultures of South America** Ethnographic survey of major native American cultures south of Mesoamerica against background of aboriginal culture history, and their relation to present day culture spheres. *Prerequisite:* 21. Three hours. Haviland. Alternate years.

**162 Cultures of Africa** Ethnographic survey of representative native societies of sub-Saharan Africa and major colonial/immigrant minorities emphasizing changes resulting from colonialism, independence, and modernization. *Prerequisite:* 21. Three hours. Gordon. Alternate years.

**163 South Pacific Cultures** Survey of major cultural areas of the South Pacific including problems of prehistory, contact with Western colonialism, and contemporary life. *Prerequisite:* 21. Three hours. Mitchell. Alternate years.

**165 Peoples of South Asia** Culture and social organization of peoples of Pakistan, India, Bangladesh, and Sri Lanka. Theoretical issues in anthropological analysis of these societies discussed. *Prerequisite:* 21. Three hours. S. Pastner. Alternate years.

**166 Peoples of the Middle East** Culture and social organization of peoples living in lands from Morocco to Afghanistan, including a consideration of Islam. *Prerequisite:* 21. Three hours. C. Pastner. Alternate years.

**167 Peoples of Canada** Exploration of native and immigrant cultures of Canada's minorities and cultural conflicts engendered in the Canadian experience. *Prerequisite:* 21, or Geography 52, or History 75 or 76. Three hours. Woolfson. Alternate years.

**168 The French in North America** Cultural patterns of French people in Canada, New England, and Louisiana with particular references to the problems of persistence and change. *Prerequisite:* 21 or Area and International Studies 91 or 92. Three hours. Woolfson. Alternate years.

**170 Pastoral Nomads** Examination of social and economic organization of migratory herding peoples against a backdrop of environmental pressures and participation in larger social systems. *Prerequisite:* 21. Three hours. S. Pastner. Alternate years.

**172 Women, Society, and Culture** Cross-cultural treatment of women which emphasizes the interrelationships between female status, social organization, and ideological systems. *Prerequisite:* 21. Three hours. C. Pastner. Alternate years.

**175 Ethnography of Art** Analysis of the art of tribal and non-Western peoples of Africa, Oceania, and North American Indians, emphasizing the relation of art to social and ideological systems. *Prerequisite:* 21. Three hours. C. Pastner. Alternate years.

**177 Crisis Cults and Movements** Examination of prophetic, millenarian, and revolutionary sects and movements emphasizing non-Western, nonindustrial societies. Specific movements viewed in their cultural context. *Prerequisite:* 21. Three hours. S. Pastner. Alternate years.

**178 Sociolinguistics** Exploration of language and non-verbal interactions as cultural activities. Focus on rules and patterns people display appropriate to communication and social interaction. *Prerequisite:* 28 or Linguistics 101. Three hours. Woolfson. Alternate years.

**179 Cultural Ecology** (Same as Geography 179.) Interrelationships of social groups and their natural environments and resource bases, with primary emphasis on nonindustrial cultures. *Prerequisite:* 21 or Geography 1 or 16. Three hours. D. Gade, S. Pastner (taught on a rotating basis). Alternate years.

**180 Psychological Anthropology** Cross-cultural study of the individual in a sociocultural context examining cognition and culture, symbols, alternative states of consciousness, human sexuality, deviance and madness, and ethnotherapy. *Prerequisite:* 21. Three hours. Mitchell. Alternate years.

**185 Urban Anthropology** Study of urbanization and urban life in non-Western countries including such topics as urban-rural ties, peasant migrations, and sociocultural adjustment to urban living. *Prerequisite:* 21. Three hours. Gordon. Alternate years.

**187 Minority Groups** (Same as Sociology 119.) Description and analysis of ethnic, racial, and religious groups in the U.S. Examination of social/cultural patterns in the larger society and in the minorities themselves. *Prerequisite:* 21. Three hours. Woolfson.

### 193, 194 College Honors

**195, 196 Intermediate Special Topics** Intermediate courses or seminars on topics beyond the scope of existing departmental offerings. See Schedule of Courses for specific titles.

### 197, 198 Readings and Research

**200 Field Work in Archaeology** Methods and techniques of archaeological investigation in field situations and the laboratory analysis of data. *Prerequisites:* 24, one 100-level course in anthropology or history, permission of instructor. Three to six hours. Summers only.

**210 Archaeological Theory** Development of archaeology from the 19th century to the present including concepts of form, space and time, intellectual attitudes, current systems theory, and research strategies. *Prerequisites:* 24, one 100-level anthropology course; or Historic Preservation 201; or graduate standing in Historic Preservation Program, or History 105, 106, or 107. Three hours. Power. Alternate years.

**225 Anthropological Theory** Schools of anthropological thought examined in relation to data on non-Western societies and the historical and social context in which the anthropologist works. *Prerequisites:* 21, one 100-level course. Three hours. Mitchell, C. Pastner.

**228 Social Organization** Examination of the basic anthropological concepts and theories used in the cross-cultural analysis of kinship and marriage. *Prerequisites:* 21, one 100-level course. Three hours. Mitchell, C. Pastner.

**283 Culture Change** Study of sociocultural transformations in non-Western countries emphasizing industrialization, urbanization, and modernization and their impact on the lives of previously traditional peoples. *Prerequisites:* 21, one 100-level course, or 21, six hours in the social sciences. Three hours. Gordon. Alternate years.

**284 Microethnography** Tape recorders and video cameras used to explore human patterns of communication; specifically phonemic, paralinguistic, haptic and kinesic detail, as well as ethnographic semantics. *Prerequisite:* 28 or Linguistics 101. Three hours. Woolfson.

**290 Methods of Ethnographic Field Work** Examination of theoretical and ethical premises of field work methodology with practical experience in participant observation, interviewing, the genealogical method, and the recording of data. *Prerequisite:* Twelve hours of anthropology. Three hours. Mitchell. Alternate years.

**295, 296 Advanced Special Topics** Advanced courses or seminars on topics beyond the scope of existing departmental offerings. See Schedule of Courses for specific titles. *Prerequisites:* 21, one 100-level course.

### 297, 298 Advanced Readings and Research

## Area and International Studies (AIS)

COLLEGE OF ARTS AND SCIENCES

Executive Committee: Professors Andrews, Dunlop, Gade,

*Geno (Director), Gordon, Metcalfe, Nalibow, Seybolt, Whitebook.*

*African Studies: Professors Eddy, Emmanuel, Flack, Folta, Gade, Gordon (Director), Kelly, King, Miles, S. Pastner, Sandoval, Schmokel, Shiman.*

*Asian Studies: Professors Alnasrawi, Andrews, Davison, Dunlop, Gaenslen, Gordon, Gussner, Hansen, Holland, McKnight, Mitchell, C. Pastner, S. Pastner, Schmidt, Seybolt (Director), Seyller, Sugarman, VanderMeer, Wu, Yadav.*

*Canadian Studies: Professors Averyt, Berkowitz, Burrell, Crane, Hunt, King, Liebs, Lipke, Mahler, Metcalfe (Director), Miles, Savitt, See, Senecal, Stanfield, Thompson, Woolf, Woolfson.*

*European Studies (Western, Northern, Mediterranean): Professors J. Ambrose, P. Ambrose, Andrea, Barnum, Bradley, Bryan, Buechler, Chapman, Davison, A.I. Dickerson, Felt, Fengler, Finney, Howe, Hutton, Lewis, Mahoney, Martin, Metcalfe, Pacy, Paden, Poger, Richel, Roland, Sandler, Scrase, Spinner, Stephany, Sweterlitsch, Wesseling, Whitebook (Director).*

*Latin American Studies: Professors Barrington, Gade (Director), Gibson, Haviland, Murad, Smela, True, Zarate.*

*Russian and East European Studies: Professors Boyd, Cook, Daniels, Feldman, Gedeon, McKenna, McReynolds, Meeke, Miller, Nalibow (Director), Pacy, Shiman, Stavakis.*

### 7,8,9,10 Directed Language Study in Critical Languages

**91 Introduction to Area** (A) Introduction to Canada: A team-taught introduction to Canada through interdisciplinary perspective. (B) Introduction to Russia and East Europe: An interdisciplinary overview from the perspectives of economics, fine arts, geography, history, political science, Russian language and literature, and sociology. Primarily designed for freshmen. Three hours.

**95, 96 Introductory Special Topics** Introductory courses or seminars on topics beyond the scope of existing departmental offerings. See Schedule of Courses for specific titles.

### 193, 194 College Honors

**195, 196 Intermediate Special Topics** Intermediate courses or seminars on topics beyond the scope of existing departmental offerings. See Schedule of Courses for specific titles.

### 197, 198 Readings and Research

**295, 296 Advanced Special Topics** Advanced courses or seminars on topics beyond the scope of existing departmental offerings. See Schedule of Courses for specific titles. *Prerequisite:* Permission by Executive Committee of Area Studies. Other area courses offered by individual academic departments.

## Art (ART)

### COLLEGE OF ARTS AND SCIENCES

*Professors Janson, Zucker; Associate Professors Davison, Fengler-Stephany, Hewitt, Higgins, Lipke, McIntyre, Owre (Chairperson), Roland; Assistant Professors Chabot, Lyman, Seyller; Instructor Peters; Lecturer Aschenbach.*

### STUDIO ART

**1 Drawing** Introductory study of visual experience through drawing and its transformation of the three-dimensional visual world onto a two-dimensional surface. Emphasis varies with instructor. Three hours.

**2 Two-Dimensional Studies** Introductory study of visual form and imagery, utilizing traditional as well as contemporary media. Emphasis varies with instructor. Three hours.

**3 Three-Dimensional Studies** Introductory study of the manipulation of actual space in diverse media. Emphasis varies with instructor. Three hours.

*Note: Art 1, 2, or 3 may, in certain cases, be taken more than once if with a different instructor and with permission of chairperson.*

**4 Introduction to Film/Video Production** Introductory study of the principles and properties of four-dimensional media, including the mechanical and electronic phenomena behind the creation of a moving image. Three hours. Lyman.

**11 Introduction to Fine Metals** Emphasizes design in the third dimension. Basic metal fabrication techniques, soldering, forming, forging, fusing, and casting. Drawing required. Three hours. Peters. Fall semester only.

**13 Introduction to Clay** Basic design and practice with clay, emphasizing hand building. Introduction to wheel throwing and to clay and glaze technology. Glazing and firing techniques. Three hours. Lyman.

**14 History of the Optical Media as Art** Theory and development of the art of "optical media:" photography, film, and video. Emphasis on discovery and explication of technical, aesthetic, and expressive properties. Three hours. Lyman.

**95 Introductory Special Topics** Introductory courses or seminars on topics beyond the scope of existing departmental offerings. See Schedule of Courses for specific titles.

**110 Clay: Moldmaking and Slipcasting** Focus on designing forms for plaster molds, moldmaking, and slipcasting. Low-fire glazing and firing. Related clay and glaze technology. *Prerequisites:* 1, 2, or 3; 13. Three hours. Chabot.

**111 Fine Metals** Continuation of third-dimensional fabrication with work in chasing, repousse, casting, stone setting, and more complex methods of construction. Design and drawing required. *Prerequisite:* 11. Three hours. Peters. Fall semester only.

**113 Clay: Hand Building** Investigation of surfaces and three-dimensional forms. Focus on variety of construction methods, surface treatment, and firing techniques. Related clay and glaze technology. *Prerequisites:* 1, 2, or 3; 13. Three hours. Chabot.

**114 Clay: Wheel Throwing** Development of throwing skills and the capacity to create a range of forms. Investigation of surface treatment techniques such as slip painting and glazing. Low-fire and stoneware firing. Related clay and glaze technology. *Prerequisites:* 1, 2, or 3; 13. Three hours. Chabot.

**115 Intermediate Drawing** Intense investigation of drawing and elements that relate to the discipline. The figure used to introduce drawing exercises dealing with contour, gesture, color, and compositional geometry. *Prerequisite:* 1. Three hours. Owre.

**121, 122 Painting** Painting as a discipline to further increase understanding and awareness of color, space, and visual perception. May be taken in either order (121 not a prerequisite for 122). *Prerequisites:* 1, 2. Three hours.

**131 Printmaking: Etching** Basic procedures in zinc plate printing stressing design and technical control of aquatint, etching, drypoint, engraving, and embossment. Offered alternate semesters. *Prerequisites:* 1, 2. Three hours. Davison.

**132 Printmaking: Silkscreen** Basic procedures in stencil printing stressing design and technical control of stencil cutting, glue and tusche resist, and photo-silkscreening. Offered alternate semesters. *Prerequisites:* 1, 2. Three hours. Davison.

**133 Printmaking: Lithography** Basic procedures in planographic printing from stone, stressing design and technical competence. Intensity of investigation varies with individual student. *Prerequisites:* 1, 2. Three hours. Davison.

**135 Intermediate Filmmaking** Techniques and theories of film production. Students edit a sound track, participate in a class-produced synchronous sound project, and individ-

ually produce a film/sound project. *Prerequisites:* 4 and either 1, 2, or 3, or permission of instructor. Three hours. Lyman.

**136 Intermediate Video** Techniques and theories of video production, including a live action studio production, a reflexive feedback production, and an edited location production. *Prerequisites:* 4 and either 1, 2, or 3, or permission of instructor. Three hours. Lyman.

**137, 138 Photography** Photographic processes as methods of seeing, emphasizing visual discovery through informed manipulation of materials. *Prerequisite:* 2. Three hours. Higgins.

**139 Animation** Techniques of single frame filmmaking, including drawing on film, producing a flipbook, animating a repetitive form, a two-dimensional sequence, and a three-dimensional sequence. *Prerequisite:* 1, 2, or 3. Three hours. Lyman.

**141, 142 Sculpture** Advanced explorations of manipulative materials. *Prerequisites:* 1, 3. Three hours. Aschenbach or Zucker.

**145 Graphic Design** The application of graphic design principles to practical problems, including the impact of popular design on society, exploration of visual elements in contemporary printing processes. *Prerequisite:* Art 1 or 2. Three hours. McIntyre.

**147 Visual Environment** Exploration of public spaces, structures, architectural detail, landscaping, roadways, lighting, etc. Field trips; meetings with planners and architects; projects. *Prerequisites:* 1, 2, or 3. Three hours.

**191<sup>o</sup> Field Experience, Internship** *Prerequisites:* Junior standing, six hours of 100-level courses in appropriate field, departmental permission (a contract must be obtained from and returned to the Art Department during preregistration). Three to six hours.

#### 193 College Honors

**195 Intermediate Special Topics** Intermediate courses or seminars on topics beyond the scope of existing departmental offerings. See Schedule of Courses for specific titles.

**197 Readings and Research: Tutorial in Studio Art** Independent/individual research in studio art. *Prerequisites:* Junior standing, six hours of studio art courses at 100 level, departmental permission (a contract must be obtained from and returned to the Art Department during preregistration). Three hours.

**215 Advanced Drawing** Intense investigation of drawing and elements that relate to that discipline. Emphasis on conceptual method, contemporary techniques, and both objective and nonobjective source material. *Prerequisite:* 115. Three hours. Owre.

**281 Advanced Studies in Studio Art** Work in close consultation with faculty sponsor on a specific and advanced project. *Prerequisites:* Senior standing, major in studio art, departmental permission (a contract must be obtained from and returned to the Art Department during preregistration), six hours of 100-level courses in topic of contract. Three hours.

**283 Advanced Seminar in Studio Art** Advanced seminar for senior studio art majors covering a range of topics. *Prerequisites:* Senior standing, major in studio art, instructor's permission. Three hours. (Not offered for graduate credit.)

### ART HISTORY

**5, 6 Art History** Painting, sculpture, and architecture in the Western world. First semester: Egyptian through Gothic. Second semester: Renaissance to the present. *Prerequisite:* 5 before 6. Three hours.

**51 Greek Art** History of art in Greek lands in ancient times. Emphasis on sculpture, architecture, and vase painting. *Prerequisite:* Sophomore standing. Three hours.

**52 Roman Art** Development of Roman art styles out of Greek forms. *Prerequisite:* Sophomore standing. Three hours.

**86 Asian Art** Introduction to the artistic traditions and major architectural monuments of India, China, Japan, and Southeast Asia. Three hours. Seyller.

**96 Introductory Special Topics** Introductory courses or seminars on topics beyond the scope of existing departmental offerings. See Schedule of Courses for specific titles.

**150 Christian Iconography** Introduction to subject matter and symbolism of Christian Art. Emphasis on major episodes from lives of Mary, of Christ, and of saints most frequently depicted in art. Examples drawn from Early Christian through Baroque periods. *Prerequisite:* 6. Three hours. Fengler-Stephany. Alternate years, 1989-90.

**153 Medieval Art to the Year 1000** Painting, sculpture, and architecture from the Early Christian through the Ottonian periods, emphasizing Byzantine and Carolingian art. *Prerequisite:* 5. Three hours. Roland. Alternate years, 1989-90.

**154 Medieval Art from the Year 1000** Painting, sculpture, and architecture of the Byzantine, Romanesque, and Gothic periods. *Prerequisite:* 5. Three hours. Roland. Alternate years, 1988-89.

**158 Northern European Art 1400-1600** Netherlandish and German art of the period. Special attention to Jan van Eyck, Rogier van der Weyden, Hugo van der Goes, Durer, Bosch, and Bruegel. *Prerequisite:* 6. Three hours. Fengler-Stephany.

**161 Italian Renaissance Painting** Painting in Italy from Gothic innovations of Giotto and Duccio through establishment of 15th century Renaissance style to the High Renaissance works of Leonardo da Vinci, Raphael, and Michelangelo. The development of Venetian painting. *Prerequisite:* 6. Three hours. Fengler-Stephany.

**164 Italian Renaissance Sculpture** Sculpture in Italy from its Gothic sources through the Renaissance period. Special attention to Ghiberti, Donatello, and Michelangelo. *Prerequisite:* 6. Three hours. Fengler-Stephany. Alternate years, 1988-89.

**167 Baroque Art in Southern Europe** Art of Italy, France, and Spain in the 17th century, emphasizing sculpture of Bernini, architecture of Versailles, and paintings of Carracci, Caravaggio, LaTour, Poussin, Zurbaran, and Velazquez. *Prerequisite:* 6. Three hours. Roland. Alternate years, 1988-89.

**168 Baroque Art in Northern Europe** Art of The Netherlands, Flanders, and England in 17th century, emphasizing paintings of Rembrandt, Vermeer, Rubens, and Van Dyck. *Prerequisite:* 6. Three hours. Roland. Alternate years, 1989-90.

**171 Rococo and Romantic Art** European architecture, sculpture, and painting, circa 1700-1850, and the origins of the modern movement. *Prerequisite:* 6. Three hours. Roland, Janson.

**172 Modern European Art** A study of principal European (including British) painters and sculptors from 1855 to 1940. *Prerequisite:* 6. Three hours. Lipke. Alternate years 1988-89.

**173 Canadian Art and Architecture** A stylistic and thematic survey of the historical development of the visual arts in Canada from 1650 to present. *Prerequisite:* 6 or Area and International Studies 91. Three hours. Lipke. Alternate years, 1988-89.

**175 19th Century Architecture** Building and design from late 18th century to end of 19th, as shaped by architects, engineers, and entrepreneurs. *Prerequisite:* 6. Three hours. Janson.

**176 20th Century Architecture** Building and design since 1900. Visits with architects and to modern buildings in the area. *Prerequisite:* 6. Three hours. Janson.

**179 Art Since 1945: Issues in Contemporary Art** Study of the development of modernism and postmodernism in contemporary art in all media. Coordinated with depart-



ment's visiting artists, art historians, and critics lecture series. Emphasis varies with instructor. *Prerequisite*: 6. Three hours.

**181 American Painting** Survey of major developments in American painting and sculpture between 1680 and 1940. *Prerequisite*: 6. Three hours. Lipke. Alternate years, 1989-90.

**184 American Architecture** The Colonial Period to Frank Lloyd Wright. Research on buildings of historical interest in the area. *Prerequisite*: 6. Three hours. Janson.

**185 Japanese Art** Architecture, sculpture, painting, prints, and decorative arts and their relationship to Japanese culture. *Prerequisites*: Three hours in art history or one of the following Asian Studies courses: Geography 58, History 32, Religion 21, 132, 141. Three hours. Seyller. Alternate years, 1988-89.

**187 Chinese Painting** History of Chinese painting, emphasizing the landscape painting of the 11th to 17th centuries. *Prerequisite*: Three hours in Art History. Three hours. Alternate years, 1988-89.

#### 194 College Honors

**196 Intermediate Special Topics** Intermediate courses or seminars on topics beyond the scope of existing departmental offerings. See Schedule of Courses for specific titles.

**198 Readings and Research** *Prerequisite*: Departmental permission. Three hours.

**201 Architecture and the Environment** (See Historic Preservation 201.) *Prerequisites*: Six hours advanced studies in art and architecture, permission. Three hours. Liebs.

**207 Studies in American Art or Architecture** Selected topics in American art and/or architecture, individual research and reports. *Prerequisite*: By permission to students of Art History, American History, or Literature. Three hours. Janson.

**282 Seminar in Art History** Individual or group study in a special area. *Prerequisites*: Six hours advanced, three in the chosen area, permission. Three hours.

**285 Seminar in Asian Art** *Prerequisites*: 186, 187 or 188; three additional hours of advanced course work either in Art History or Asian Studies. Seyller.

**296 Advanced Special Topics** Advanced courses or seminars on topics beyond the scope of existing departmental offerings. See Schedule of Courses for specific titles.

## Biochemistry (BIOC)

### COLLEGE OF MEDICINE

*Professors Chiu, Collen, Cutroneo, Mann (Chairperson), Meyer, J. Thanassi, Woodworth; Adjunct Professor Sato; Associate Professors Auletta, Ehrlich, Hart, Long, Rittenhouse; Adjunct Associate Professors Crabb, Harris, McKeehan; Assistant Professors Heintz, Lollar, Stump; Research Associate Professor N. Thanassi; Research Assistant Professors Church, Krishnaswamy, Mason, P. Tracy, R. Tracy.*

**191, 192 Undergraduate Research** Participation in a research program currently being pursued by a faculty member of department. Written report due at end of each semester. *Prerequisites*: Chemistry 1, 2 or 11, 12. Some programs may require additional courses in chemistry. Credit as arranged, up to four hours per semester.

**212 Biochemistry of Human Disease** Disorders of hemoglobin, iron bilirubin; biochemistry of diabetes, pancreatitis, atherosclerosis, liver and kidney dysfunction; acid-base balance; gene therapy; diagnostic enzymology. Lab experiments utilize animal models to illustrate disease states. *Prerequisites*: Chemistry 42 or 141, Agricultural Biochemistry 201. Three to four hours.

## Botany (BOT)

### COLLEGE OF AGRICULTURE AND LIFE SCIENCES

*Professors Etherton, Klein, Ullrich, Vogelmann (Chairperson), Worley; Associate Professors Barrington, Cook; Research Professor Tyree; Research Assistant Professors Lintilhac, Sperry; Lecturers Davis, Hoffmann.*

### BIOLOGY (BIOL)

**1,2 Principles of Biology (3-3)** Introduction to structure, functions, and evolution of animals and plants. Concepts important for advanced study in a life science and for understanding the biological world. Four hours.<sup>1</sup>

**255 Structure and Function of Chromosomes** Analysis of recombination. Arrangement of DNA and proteins; DNA duplication; mapping of DNA regions. Molecular nature of meiosis; the nucleolus and control of gene expression. *Prerequisites*: Biology 101; Chemistry 42 or 141, 142. Three hours. Alternate years, 1989-90.

### BOTANY (BOT)

**4 Introduction to Botany (3-3)** Structure, function, and reproduction of plants. Fundamental aspects of plant science with implications of botanical knowledge needed for applied plant sciences. Four hours. Cook.<sup>1,2</sup>

**6 The Green World** Evaluation of the impact of plants on the aesthetic, cultural, social, medical, and religious lives of peoples of the world. Botany and Biological Science majors will not receive credit for Botany 6 as part of program distribution requirements. Three hours. I. Hoffmann. Alternate years, 1988-89.

**101 Genetics** (See Zoology, Biology 101.)

**104 Physiology of the Plant Body (3-3)** Study of the plant as a whole, growth and development, water and mineral relations, environmental factors, and regulatory processes. *Prerequisites*: One year of plant or biological science, beginning chemistry recommended, or permission of instructor. Four hours. Klein.

**107 Algae, Fungi, and Bryophytes (3-3)** Structure, reproduction, and evolutionary relationships of the non-vascular plants; ecological roles and economic significance; field identification and culture techniques. *Prerequisite*: 4 or Biology 1, 2. Four hours. Cook.

**108 Morphology and Evolution of Vascular Plants (3-3)** An evolutionary survey of living and fossil vascular plants emphasizing morphology and geography. Discussion of pertinent literature on phytochemistry, genetics, and ecology. *Prerequisite*: 4 or Biology 1, 2. Four hours. Barrington.

**109 Systematics and Phylogeny (2-4)** Classification; evolution of flowering plants; characterization and recognition of major families; species and generic concepts; biosystematics; taxonomic keys; preparation of herbarium specimens. *Prerequisite*: 4 or Biology 1, 2. Four hours. Vogelmann.

**117 Plant Pathology (3-2)** Diagnosis, life history, control of diseases caused by fungi, viruses, bacteria, nematodes, parasitic plants, and environmental factors. Physiology, biochemistry, and genetics of host-parasite interaction. *Prerequisite*: 4 or Biology 1, 2. Four hours. Ullrich. Alternate years, 1989-90.

**132 Elementary Genetics** Introduction to the genetics of eucaryotes as applied to plant and animal breeding, syste-

<sup>1</sup>Credit not given for both courses in each or any of the following combinations: (Biology 1 and Zoology 8), (Biology 1 and Zoology 9), (Biology 1 and Zoology 95), (Biology 1 and Botany 4), (Biology 2 and Botany 4), (Biology 2 and Zoology 9), (Biology 2 and Biology 3), (Biology 2 and Zoology 96).

<sup>2</sup>Biology and Zoology majors may not receive credit for Botany 4.

matics, and genetic engineering applied to agriculture. *Prerequisite:* 4 or Biology 1, 2; a semester of college chemistry and either mathematics or statistics. Three hours. I.

**149 Maple Science and Practice (1-2)** Ecology, anatomy, physiology, pathology, and propagation; sap and syrup chemistry. Maple industry problems: sap gathering, syrup production, methodology, and marketing. Trips to Maple Research Farm. *Prerequisites:* 4 or Biology 1, 2; Chemistry 3 or 1, 2; or permission of instructor. Three hours. Alternate years, 1988-89.

**152 Plant Anatomy and Histology** Development of the organism and accompanying integration of cellular tissues. Ontogeny of vegetative tissues; modifications of the cell wall. *Prerequisite:* 4 or Biology 1,2. Three hours. Etherton.

**160 Plant Ecology (3-3)** Introduction to interactions among plants and their environments. Dynamics of aquatic and terrestrial ecosystems emphasizing populations; physiological ecology; experimental design and analysis. *Prerequisite:* 4 or Biology 1, 2. Four hours. I. Hoffmann. Alternate years, 1989-90.

**193, 194 College Honors** (For Arts and Sciences seniors.)

**197, 198 Undergraduate Research and Apprenticeships** Individual projects under direction of a faculty member. Project may involve original research, readings, or apprenticeships. *Prerequisites:* Junior or senior standing, departmental permission. Three to six hours.

**205 Mineral Nutrition of Plants** Role of essential elements for plant growth including classical and modern approaches to the study of ion availability and transport. *Prerequisite:* 104. Three hours. Etherton, Bartlett. Alternate years, 1988-89.

**209 Biology of Ferns** Evolutionary biology; a survey of New England ferns and discussion of their phylogenetic relationships; current research emphasizing morphological, biogeographical, genetic, and phytochemical aspects of speciation. *Prerequisite:* 108; 101 or 132 recommended. Three hours. Barrington. Alternate years, 1989-90.

**213 Plant Communities (2-2)** Plant sociology; structure and organization of the plant community; sampling methods and analysis of data; climatic and edaphic factors; field work. *Prerequisite:* 109 or departmental permission. Three hours. II. Vogelmann.

**229 Water Relations of Plants** (See Forestry 229.)

**232 Botany Field Trip** Trips to selected environments outside Vermont, led by faculty members representing different fields of botany. Overall, integrated approach to ecology, structure, and function. One hour. Christmas or spring vacation or end of school year.

**234 Ecology of Freshwater Algae (2-3)** Environmental factors influencing distribution and seasonal succession; quantitative methods for estimating standing crop productivity; kinetics of algal growth; competitive and synergistic interactions. *Prerequisite:* 160 or Biology 102. Three hours. Cook. Alternate years, 1989-90.

**241 Tropical Plant Systematics** Principles and methods of angiosperm phylogeny. Recent systematic and evolutionary research on flowering plants; survey of tropical flowering plant families. Student presentations on recent research. *Prerequisite:* 109. Four hours. Barrington. Alternate years, 1988-89.

**250 Microtechnique (1-4)** Theory and practice in preparation of biological materials for anatomical and cytological study, including histochemistry and photomicrography. *Prerequisites:* Introductory Chemistry; some knowledge of organic chemistry, anatomy, or cytology desirable. Three hours. Cook. Alternate years, 1989-90.

**252 Molecular Genetics II: Regulation of Gene Expression in Eukaryotes** Expression of genetic information

in nucleic acids; knowledge generated from recombinant DNA techniques applied to higher cells; control in transposition, transformation, transcription, and processing transcript. *Prerequisites:* Biology 101 or Biochemistry 301, or equivalents; Microbiology 211 preferred; permission of instructor. Three hours. Ullrich. Alternate years, 1988-89.

**254 Fungal Genetics** Fungi contribute knowledge in classical and molecular genetics and are of great economic importance in agriculture, biotechnology, and industry. This course studies these aspects. *Prerequisite:* Biology 101 or Biochemistry 301 or equivalents; permission of instructor. Three hours. Ullrich. Alternate years, 1989-90.

**256 Advanced Plant Genetics** Review of major topics in higher plant genetics and cytogenetics. Designed to be applied to the systematics, breeding, and gene engineering of higher plants. *Prerequisite:* 132 or Biology 101. Three hours. Alternate years 1988-89.

**257 Physiology of the Plant Cell (3-2)** Detailed study of photosynthesis, plant cell membrane function, and plant cell growth. *Prerequisites:* 104, Chemistry 141, 142 or Chemistry 42, Physics 11, 12 or 31, 42. Four hours. Etherton. Alternate years, 1989-90.

**281, 282 Botany Seminar** Presentations of personal research by faculty, graduate students, and outside guest speakers. Required attendance of Botany graduate students and seniors in botanical research programs. Without credit.

**295 Special Topics** For advanced students within areas of expertise of faculty. Aspects of ecology, physiology, genetics, cytology, bryology, pteridology, paleobotany, photobiology, membrane physiology, and cell biology. *Prerequisite:* Permission of department.

## Business Administration (BSAD)

### SCHOOL OF BUSINESS ADMINISTRATION

*Professors Brandenburg (Dean), Grinnell, Hennessey, Laber, Savitt, Shirland, Thimm; Associate Professors Averyt, Cats-Baril, Gatti, Gurdon, Jesse, Kraushaar, McIntosh, Parke, Tashman; Assistant Professors Battelle, Committe, Dempsey, Hummel, Hunt, Jackson, Posey, Sinkula.*

### BUSINESS ENVIRONMENT

**17, 18 Business Law** Concepts of law as related to business, including law of contracts, sales, bailments, and negotiable instruments, business and laws of agency, partnerships, and corporations. Sophomore standing. Three hours.

**132 Legal and Political Environment of Business** Interaction of business and society. Emphasis on business roles in the complex and dynamic, legal, political, and social environment. *Prerequisites:* 60, 61, Economics 11, 12; junior standing. Three hours.

**133 Government and Business** Interaction of business and government. Emphasis on industrial concentration and power, history and enforcement of legislation, and conflicting goals of economic efficiency and political feasibility. *Prerequisite:* 132. Three hours.

**134 Canadian-U.S. Business Relations** A study of the Canadian-U.S. bilateral relationship as it affects international business, emphasizing trade, investment, energy, and industrial development policies. *Prerequisites:* Economics 11, 12; junior standing. Three hours.

**135 Business and Government in the International Arena** Study of national government and international organization laws, regulations, and policies affecting international business, emphasizing trade and investment issues. *Prerequisites:* 132, junior standing. Three hours.

**136 Political Risk and the International Corporation** Analysis of how the international corporation monitors and manages political risk on international business operations. *Prerequisite:* 132 or permission of instructor. Three hours.

**191 Business Policy** A variety of policy questions are examined. The viewpoint is global rather than functional. Problems include make or buy, plant location, product addition, and expansion. *Prerequisite:* Second semester BSAD senior standing. Three hours.

**195, 196 Special Topics** Specialized or experimental courses offered as resources permit.

**197, 198 Independent Study** Independent investigation designed by the student as a means of applying prior course work to a specialized problem. Well suited for senior projects. *Prerequisite:* Permission of BSAD Undergraduate Studies Committee.

## ACCOUNTING

**60 Financial Accounting** Introduction to generally accepted accounting principles and techniques regarding corporations, partnerships, and proprietorships as they apply to income determination and financial position presentation. *Prerequisite:* Sophomore standing. Four hours.

**61 Managerial Accounting** Introduction to use of accounting for planning, cost behavior and control, and decision making. *Prerequisite:* 60. Four hours.

**160 Corporate Financial Reporting** A study of corporate financial accounting and reporting practices, focusing on contemporary issues and controversies. Not open to students who have completed BSAD 162. *Prerequisites:* 60, junior standing. Three hours.

**161, 162 Intermediate Accounting** Principles, concepts, techniques, and issues involved in accounting for the assets, liabilities, and owners equity and their related effect on income determination of an enterprise. *Prerequisites:* 60 for 161, junior standing; 161 for 162. Three hours.

**164 Introduction to Federal Taxation** Examination of the Internal Revenue Code primarily regarding income tax law for individuals and partnerships. Corporate and trust tax law introduced. *Prerequisites:* 60, junior standing. Three hours.

**165 Accounting Theory** Study of underlying concepts, principles, and structure of accounting. Topics covered include financial accounting standards, opinions of the APB, professional literature, and current applications. *Prerequisite:* 162. Three hours.

**166 Advanced Accounting** Accounting for partnerships, special sales contracts, parent-subsidiary relationships, fiduciary relationships, and governmental units. *Prerequisite:* 162. Three hours.

**167 Auditing** Independent and internal auditing. Topics include standards, ethics and legal responsibilities of the profession, financial statements, audit concepts and techniques, and the audit option. *Prerequisite:* 166. Three hours.

**168 Cost Accounting** Accounting for inventory valuation and income determination, nonroutine decisions, policy making and long-range planning. *Prerequisites:* 61, junior standing. Three hours.

## FINANCE

**180 Managerial Finance** The financial function in the corporation described. Techniques for evaluating current use of resources and proposed resource acquisitions or dispositions covered. *Prerequisites:* 61, Economics 12, Statistics 141, junior standing. Three hours.

**181 Issues in Financial Management** Examines key areas of financial decision making. With cases and problems, issues such as capital budgeting, leasing, mergers, and acquisitions examined. *Prerequisite:* 180. Three hours.

**182 Security Valuation and Portfolio Selection** Examination of the theories and evidence on the behavior of financial asset prices and rational portfolio selection. *Prerequisites:* 180, 184 recommended. Three hours.

**183 International Financial Management** Theories and practices of international financial management examined. Topics investigated include: systems of international exchange, spot and forward markets, and expropriation and exchange risk. *Prerequisites:* 180, 184. Three hours.

**184 Financial Institutions and Markets** Financial institutions and credit allocation, determinants of the level and term structure of interest rates, and characteristics of financial institutions and markets. *Prerequisite:* 180. Three hours.

**185 Topics in Financial Theory and Practice** One- to three-credit modules focusing on financial theory and applications. Subjects covered vary each year, including: financial futures markets, options, municipal securities, bankruptcy, SEC regulation, bankers acceptances, interest rate swaps, mortgage-backed bonds, securitization of index trading. *Prerequisite:* 180 (184 recommended). One to three hours.

## HUMAN RESOURCE MANAGEMENT

**120 Principles of Management and Organizational Behavior** Fundamentals of management, organization theory, behavior, and interpersonal communication in a transnational context. *Prerequisite:* Junior standing. Three hours.

**121 Selected Topics in Organizational Behavior** Focuses on ways in which individuals and work groups within organizations can be better utilized as organizational resources. *Prerequisite:* 120. Three hours.

**122 Personnel Management** Includes the study of job analysis, recruitment, selection, training and employee development, health and safety, compensation, performance appraisal, and other employee-related topics. *Prerequisite:* 120. Three hours.

**123 Collective Bargaining and Conflict Resolution** Focuses on union-employer relations and on developing the student's negotiation skills. Topics include the union contract, the causes of strikes, and the techniques for resolving conflict. A bargaining simulation is incorporated. *Prerequisite:* 120. Three hours.

**126 Current Issues in Management and Organizational Theory** One- and two-credit seminars. Subjects include training and development, selection and recruitment, and affirmative action. *Prerequisite:* 120. One to three hours.

**127 International Industrial Relations** Reviews special problems in the management of human resources in a global economy. Focuses on cultural differences, a comparison of labor-management systems in a number of countries, the role of multinational corporations, and the impact of foreign enterprises on employment practices in host countries. *Prerequisite:* 120. Three hours.

## MANAGEMENT INFORMATION SYSTEMS

**141 Management Information Systems** Integrates computer hardware and software concepts with a classical methodology for developing business information systems. Presents the relevant factors to be considered in the development of information systems and discusses the problems of analyzing, designing, and implementing such systems. *Prerequisites:* Computer Science 11, Statistics 141, Math. 20, junior standing. Three hours.

**142 Structured Business Programming — COBOL** Fundamental principles of business computer programming. Topics include: the constructs of structured programming, top-down and modular development, sequential and nonsequential access techniques, other features of the COBOL language. Programming exercises include data editing, reporting, and file updating. An on-line program development mode used. *Prerequisite:* 141. Three hours.

**143 Structured Analysis and Design of Business Systems** In-depth study of business information system development cycle emphasizing analysis and design phases. Structured analysis and design techniques used to develop models of business information systems. Case studies such as payroll, inventory, accounts receivables, order entry, billing. *Prerequisites:* 141; 142 or Computer Science 15. Three hours.

**144 Data Base Development and Administration** Exposes student to data base system development cycle from analysis to design, implementation, and administration. Central focus on complex data structure modeling, data base implementation and administration. A project involving analysis, design, and implementation required. *Prerequisites:* 141; 142 or Computer Science 15. Three hours.

**145 Managing the Information System Resource** Theory and practice of managing resources of an organization's information system. Responsibilities and interactions of upper level, function area, and information system managers emphasized. Topics include project selection and control, staffing, organizing, planning, and managing the information system function. *Prerequisites:* 143, 144, or permission of instructor. Three hours.

## MARKETING

**154 Marketing Management** The place of marketing in our economy. Analysis of the market structure by function, institutions, and commodities. Consumer and organizational activities reviewed. *Prerequisites:* Statistics 141, Computer Science 11, Economics 11, 12; junior standing. Three hours.

**155 Consumer Behavior** Exploration and analysis of research evidence from marketing and behavioral science relevant to a theory of consumer behavior. Emphasis also given to research methodologies. *Prerequisite:* 154. Three hours.

**156 Current Marketing Developments** Analysis of both present and future changes affecting marketing theory and practice. Topics include social changes, functional and institutional marketing system changes. Individual research projects required. *Prerequisite:* 154. Three hours.

**157 Marketing Research** The role of research in a marketing information framework. Emphasis on survey research, data collection, and analysis. Experimental designs also examined. *Prerequisites:* 154, Statistics 141. Three hours.

**158 Business Logistics Management** Study of the logistics activities of the firm, focusing on transportation, inventory control, warehousing, customer service, and site location. Interrelationships between these activities and production and marketing activities of firm. *Prerequisites:* 154, 173. Three hours.

**159 Topics in Marketing Management** The use of advanced cases to aid in the formulation of overall policies and planning strategies for marketing programs. Topics include product planning and channel selection. *Prerequisite:* 154. Three hours.

## PRODUCTION AND OPERATIONS MANAGEMENT AND QUANTITATIVE METHODS

**170 Business Forecasting Methods** Looks inside the crystal ball at major forecasting methods (Smoothing, Regression, Econometric, Box-Jenkins, Combined), and analyzes elements of good forecasting practice in an organization. Extensive use of PC forecasting packages. *Prerequisite:* 172. Three hours.

**171 Safety Engineering** (Same as Mechanical Engineering 152.)

**172 Managerial Economics** Application of economic, mathematical, and statistical models to managerial decision making. Software support from PC spreadsheet programs. *Prerequisites:* 61, Math. 20, Statistics 141, Economics 11, 12, Computer Science 11; junior standing. Three hours.

**173 Production and Operations Analysis I** Study of methods used in planning, analysis, and control of production and service processes. Topics include forecasting, scheduling, production and inventory control, sequencing, line balancing, learning curves, and networks. *Prerequisites:* Math. 20, Statistics 141, junior standing. Three hours.

**174 Production and Operations Analysis II** Study of the operations function in industrial and service organizations. Practical applications of planning, analysis, design, and control stressed. *Prerequisite:* 173. Three hours.

**175 Human Factors** (Same as Mechanical Engineering 175.)

**176 Plant Planning and Design** (Same as Mechanical Engineering 176.)

**177 Introduction to Decision Making Under Uncertainty** Probability models as applied to the optimal choice among alternative actions or strategies when outcomes are uncertain. *Prerequisite:* 173. Three hours.

**178 Quality Assurance** Analysis and design of systems for obtaining quality in operations. Topic areas include measurements, inspection, economic design, product design. *Prerequisites:* Math. 20, Statistics 141. Three hours.

**179 Introduction to Operations Research** Analysis, emphasizing applications of business decision problems using mathematical modeling. Topics include mathematical programming, network analysis, and simulation. *Prerequisite:* 173. Three hours.

**272 Discrete Simulation** Discrete simulation using monte-carlo techniques and the GPSS simulation processor; mathematical modeling of systems; control systems; validation and sensitivity analyses. *Prerequisites:* Statistics 141 or 151, senior standing. Three hours.

## Chemistry (CHEM)

### COLLEGE OF ARTS AND SCIENCES

*Professors Allen, Bushweller (Chairperson), Flanagan, Geiger, Krapcho, Kuehne, Strauss, White; Associate Professors Goldberg, Leenstra, Welton; Assistant Professor Hubbard.*

*Note: Credit cannot be given for: 1 and also 3 or 5 or 11 or 13; 2 and also 12 or 14; 3 and also 5; 3 and also 11 or 13; 4 and also 6; 4 and also 42 or 44; 5 and also 11 or 13; 6 and also 42 or 44; 14 and also 121; 42 and also 141; 42 and also 143; 44 and also 141 or 143; 141 and also 143; 142 and also 144; 142 and also 143, 144; 160 and also 162.*

**1, 2 Introductory Chemistry (3-3)** Basic course in principles and concepts of general chemistry. These courses, or Chemistry 11, 12 serve as suitable prerequisites for 100-level courses in Chemistry. *Prerequisite:* 1 or 11 for 2. Four hours.

**3 Outline of General Chemistry (3-3)** One-semester survey of principles and concepts of general chemistry, designed primarily to meet needs of students in agricultural and health sciences. Four hours.

**4 Outline of Organic and Biochemistry (3-3)** Broad overview of most important facts and principles of organic and biochemistry and of interrelationships between these branches of chemistry. *Prerequisite:* 1 or 3. Four hours.

**5 Outline of General Chemistry** One-semester survey of principles and concepts of general chemistry, designed primarily to meet the needs of students in agricultural and health sciences. NO LABORATORY. Three hours.

**6 Outline of Organic and Biochemistry** Broad overview of most important facts and principles of organic and biochemistry and of interrelationships between these branches of chemistry. NO LABORATORY. *Prerequisite:* 1 or 3 or 5. Three hours.

**7 Earth, Air, Fire, and Water** Introductory course for nonscience majors which deals with an understanding of one's surroundings in molecular terms. Concepts of energy, structure, and change as related to the observable universe. Three hours.

**11, 12 General Chemistry (3-0)** General and analytical chemistry for students with a strong background in physical sciences and mathematics. Recommended for students concentrating in physical sciences. *Prerequisites:* One year of high school chemistry, concurrent enrollment or background in calculus. High school physics recommended; concurrent enrollment in 13, 14 required, 1 or 11 required for 12. Three hours.

**13, 14 General and Quantitative Analysis Laboratory (0-6)** Laboratory course in general and analytical chemistry. Basic techniques of gravimetric, volumetric, potentiometric, and spectrophotometric analyses and applications to determination of basic chemical properties. Selected experiments in thermochemistry and kinetics. *Prerequisite:* Concurrent enrollment in 11, 12 required. Two hours.

**19 Mathematical Preparation for General Chemistry** Designed to fill in gaps, largely mathematical, in students' backgrounds and preparation for introductory chemistry. Enrollment by permission. No credit. Meets only during first four weeks of semester.

**42 Introductory Organic Chemistry (3-3)** Concepts for understanding chemistry of structurally simple organic compounds of everyday importance. These principles applied to more complex molecules such as polymers and biologically important compounds such as proteins, lipids, and carbohydrates. (Does not satisfy medical school entrance requirements for undergraduate preparation in organic chemistry). *Prerequisite:* 1 or 3. Four hours.

**44 Introductory Organic Chemistry** Concepts for understanding chemistry of structurally simple organic compounds of everyday importance. These principles applied to more complex molecules such as polymers and biologically important compounds such as proteins, lipids, and carbohydrates. (Does not satisfy medical school entrance requirements for undergraduate preparation in organic chemistry.) NO LABORATORY. *Prerequisite:* 1 or 3 or 5. Three hours.

**95, 96 Introductory Special Topics** Introductory courses or seminars on topics beyond the scope of existing departmental offerings. See Schedule of Courses for specific titles.

**121 Quantitative Analysis (2-6)** Theory and practice of volumetric and gravimetric analysis. Theoretical discussion of indicators, buffers, pH, etc. Introduction to data analysis, spectrophotometry, and chromatography. *Prerequisites:* 1, 2. Not open to students with credit for 13, 14. Four hours.

**141, 142 Organic Chemistry (3-3)** Survey of properties and reactions of organic compounds with consideration of bonding, stereochemistry, mechanisms, principles of reactivity, spectroscopy, syntheses, and utilization. Designed for pre-medical, pre-dental, and pre-veterinary students and for those majoring in biological and physical sciences. *Prerequisites:* 1, 2 or 11, 12; 141 for 142. Four hours.

**143, 144 Organic Chemistry for Chemistry Majors (3-0)** Survey of principles and reactions of organic chemistry for chemistry majors. Concurrent enrollment in 145, 146 required. *Prerequisites:* 1, 2 or 11, 12. Three hours.

**145, 146 Organic Chemistry Laboratory (0-6)** Laboratory practice in separation, purification, synthesis, identification, spectroscopy, and physical organic techniques as applied to organic compounds. For Chemistry majors. Concurrent enrollment in 143, 144 or 141, 142 required. Two hours.

**160 Physical Chemistry for Biological Science Students** Aspects of physical chemistry most pertinent to work in biological sciences: acid-base equilibrium, theory of solutions, thermodynamics and kinetics. *Prerequisites:* 2, Physics 16. Three hours.

**162, 163 Physical Chemistry** Elementary quantum

chemistry, introduction to statistical mechanics, thermodynamics, properties of solutions and chemical kinetics. *Prerequisites:* 2 or 12, Physics 16 or 25, Math. 121 for 163. Three hours.

### 193, 194 College Honors

**195, 196 Intermediate Special Topics** Intermediate courses or seminars on topics beyond the scope of existing departmental offerings. See Schedule of Courses for specific titles.

**201 Advanced Chemistry Laboratory (1-6)** Laboratory and discussion only. Laboratory problems requiring modern analytical, physical, and inorganic synthetic techniques. *Prerequisites:* 146, 221, credit for or concurrent enrollment in 162 or 163. Three hours.

**202 Advanced Chemistry Laboratory (0-6)** Laboratory only. Laboratory problems requiring modern analytical, physical, and inorganic synthetic techniques. *Prerequisites:* 201. Two hours.

**211 Chemical Kinetics and Mechanism** Important aspects and applications of chemical kinetics. Theoretical and mathematical aspects covered at introductory level. Considerable emphasis on interpretation of experimental rate laws in terms of mechanistic hypotheses for selected reactions. *Prerequisites:* 142, 162, 163. Three hours. White.

**214 Polymer Chemistry** Polymer size and weight distributions. Synthesis and properties of organic and inorganic polymers. Kinetics of polymerization. Polymer characterization. Polymer formulation. *Prerequisites:* 144, 162. Three hours. Allen. Alternate years.

**221 Instrumental Analysis** Systematic survey of modern methods of chemical analysis. Fundamental principles and applications of spectroscopy, electrochemistry, and separation techniques. *Prerequisites:* Credit for or concurrent enrollment in 162 or 163. Three hours. Geiger, Goldberg.

**222 Advanced Analytical Chemistry** In-depth coverage of selected modern instrumental methods of chemical analysis, emphasizing most recent developments in spectroscopy, electrochemistry, and separation techniques. *Prerequisite:* 221. Three hours. Geiger, Goldberg.

**224 Chemical Separations** Theory and practice of chromatographic separations. Emphasis on gas-liquid, liquid-liquid, and liquid-solid chromatography. *Prerequisite:* 221. Three hours. Alternate years.

**225 Electroanalytical Chemistry** Principles of modern electrochemical analysis focusing mainly on finite current methods — voltammetry polarography, chronoamperometry, cyclic voltammetry, etc. Introductory to modern operational amplifier instrumentation. Double layer theory and electron transfer kinetics. *Prerequisite:* 163. Three hours. Geiger. Alternate years.

**226 Analytical Spectroscopy** Principles of optical spectroscopic methods of analysis. Emphasis on theory and practice of atomic spectroscopy and new molecular spectroscopic methods. *Prerequisite:* 221. Three hours. Geiger, Goldberg.

**227, 228 Special Topics in Analytical Chemistry** Selected topics of current interest in analytical chemistry. New techniques and methodologies, especially in chemical instrumentation, typically covered. Credit as arranged.

**231 Inorganic Chemistry** Fundamental concepts and facts of inorganic systems. Molecular symmetry, models for structure and bonding, acid-base chemistry, descriptive chemistry of ionic and covalent compounds, introductory crystal field theory, reaction mechanisms. *Prerequisite:* 162. Three hours. Allen, Hubbard.

**232 Advanced Inorganic Chemistry** Selected topics include applications of group theory to vibrational spectroscopy and electronic structure, multiple bonding in main group and transition metal compounds, electron-deficient bonding, bioinorganic chemistry. *Prerequisite:* 231. Three hours. Allen, Hubbard.

**234 Organometallic Chemistry** Systematic survey of syntheses, properties, structures, bonding, and reactions of both main group and transition series organometallic compounds. Variation of structure and metal-carbon bond stability throughout periodic system. *Prerequisite:* 231. Three hours. Allen, Hubbard. Alternate years.

**236 Physical Inorganic Chemistry** Fundamental physical basis for spectroscopic techniques and other observable phenomena important to field of inorganic chemistry. Topics include ligand field theory, magnetism, magnetic resonance, Mossbauer spectroscopy, and optical activity. *Prerequisites:* 163, 232. Three hours. Allen, Hubbard. Alternate years.

**237, 238 Special Topics in Inorganic Chemistry** Advanced theoretical treatment of bonding and of physical properties of transition metal complexes; detailed treatment of inorganic reaction mechanisms. Credit as arranged.

**241 Advanced Organic Chemistry** Stereochemistry, reactivity criteria, reaction mechanisms, and synthetic methods stressed. Reactive intermediates such as carbanions, carbocations, carbenes, and free radicals used to systemize mechanistic discussions. *Prerequisites:* 142, 162. Three hours. Krapcho, Kuehne, Strauss, White.

**242 Advanced Organic Chemistry** Detailed mechanistic descriptions of processes which may include enolate reactions and stereochemical considerations, addition processes such as halogenation, cycloadditions, hydroboration, hydride and metal-ammonia reductions, annulations such as biomimetic cyclizations, oxidation processes, rearrangements, eliminations, and examinations of approaches to multistep syntheses. *Prerequisite:* 241. Three hours. Krapcho, Kuehne, Strauss, White.

**251 Physical Organic Chemistry** Structure-reactivity relationships, molecular properties and their interpretation. Methods and results of investigations of mechanisms of common organic reactions. *Prerequisites:* 142, 162. Three hours. Bushweller, Krapcho, Strauss, White. Alternate years.

**257, 258 Special Topics in Organic Chemistry** Advanced level discussion of specific topics in organic chemistry of current interest such as photochemistry, carbenes, bioorganic chemistry, magnetic resonance, etc. Credit as arranged.

**262 Chemical Thermodynamics** Systematic study of application of thermodynamics to chemical problems. Concepts of statistical thermodynamics introduced. *Prerequisites:* 162, 163. Three hours. Flanagan. Alternate years.

**263 Introduction to Quantum Mechanics** General considerations of quantum mechanics. Development of techniques pertinent to application of quantum mechanics to chemical problems. *Prerequisites:* 162, 163. Three hours. Weltin. Alternate years.

**264 Fundamentals of Spectroscopy** General discussion of molecular spectroscopy, rotational and vibrational states of molecules, symmetry of vibrations; introduction to electronic spectra. *Prerequisites:* 162, 163, Math. 121. Three hours. Weltin, Leenstra. Alternate years.

**265 Statistical Mechanics** Development of statistical mechanics and its application to problems of chemical interest. *Prerequisites:* 162, 163; 263 recommended. Three hours. Flanagan. Alternate years.

**266 Molecular Orbital Theory** Introduction to Huckel molecular orbital method. Energy levels and orbitals, molecular properties and their interpretation. Effects of substituents on electronic structure. Extensions of Huckel method. *Prerequisites:* 142, 163. Three hours. Weltin. Alternate years.

**267, 268 Special Topics in Physical Chemistry** Advanced level discussion of specific topics in physical chemistry and chemical physics; group theory, solid state theory; irreversible thermodynamics, solution theory. Credit as arranged.

**282 Senior Seminar** Oral and written presentation of a subject of current chemical interest. *Prerequisite:* Audit of 381. One hour.

**291 Undergraduate Research** Special study in inorganic, analytical, physical, or organic chemistry with an assigned staff member. Findings submitted in written form. *Prerequisite:* Departmental permission. Credit as arranged with maximum of four hours per semester and 12 hours for the undergraduate program.

**295, 296 Advanced Special Topics** Advanced courses or seminars on topics beyond the scope of existing departmental offerings. See Schedule of Courses for specific titles.

## Chinese (CHIN)

### COLLEGE OF ARTS AND SCIENCES

*Assistant Professor Wu.*

**1, 2 Elementary Chinese** A study of Mandarin Chinese designed to give the beginning student the fundamental grammar and vocabulary for speaking, reading, and writing the modern national language. Four hours.

**51, 52 Intermediate Chinese** A continuation of 1, 2 designed to enable the student to converse in everyday Chinese, and to read and write simple texts. *Prerequisite:* 2 or equivalent. Four hours.

**101, 102 Advanced Chinese** Structured readings with emphasis on sentence structures, vocabulary expansion, and increased fluency in self-expression. *Prerequisite:* 52 or equivalent. Four hours.

## Civil Engineering (CE)

### COLLEGE OF ENGINEERING AND MATHEMATICS

*Professors Cassell, Dawson, Hemenway, Oppenlander; Associate Professors Beliveau, Downer, Laible, Olson; Assistant Professor Morris; Adjunct Professor Knight.*

**1 Statics (3-0)** Fundamentals of statics; composition and resolution of forces; the analysis of force systems in two and three dimensions; and centroids and moments of inertia. *Prerequisite:* Math. 22. Three hours.

**10 Surveying (3-4)** Fundamental surveying methods; propagation of errors as applied to surveying measurements; triangulation; control surveys; and traverse adjustments. *Prerequisites:* Math. 21, Computer Science 11. Four hours.

**11 Geometronics (2-4)** Selected items in analytical photogrammetry; celestial observations, elements of photo-interpretation; theory of curves; and digital terrain analysis. *Prerequisites:* 10 or 12, Math. 22. Three hours.

**12 Plane Surveying (3-4)** Fundamental surveying methods; elements of topographic surveying; and special problems according to student interest. For those not enrolled in CE. *Prerequisites:* Math. 2 and/or equivalent. Four hours.

**100 Mechanics of Materials I (3-0)** (Same as Mechanical Engineering 14.) Stress, strain, temperature relationships, torsion, bending stresses, and deflections. Columns, joints, thin-walled cylinders. Combined stresses and Mohr's circle. *Prerequisites:* 1, Math. 121, Mechanical Engineering 12 or concurrent enrollment. Three hours.

**101 Mechanics of Materials Laboratory (1-3)** Experimental stress analysis methods; fundamental properties of metals, plastics, and wood; effects of size, shape, method, speed of loading, and strain history on these properties. *Prerequisite:* 100. Two hours.

**125 Engineering Economy (3-0)** Comparison of alter-

natives to maximize the financial return on engineering decisions; project feasibility studies; design decision making; effect of taxes on engineering decisions; analysis of risk. *Prerequisite:* Junior standing. Three hours. Oppenlander.

**130 Engineering Planning (2-0)** Principles and techniques for determination of design loads on civil engineering systems; estimating concepts for point and interval forecasts; and stochastic and economic considerations. *Prerequisites:* Statistics 141, senior standing. Two hours.

**140 Transportation Planning (3-0)** Analysis of transportation systems; technological characteristics; the transportation planning process and techniques of travel modeling and forecasting for both urban and rural areas. *Prerequisite:* 10. Three hours.

**141 Traffic Operations and Design (3-0)** Characteristics of vehicular and pedestrian traffic; highway and intersection capacity; measurement and analysis of traffic characteristics; design and application of controls. *Prerequisite:* 140. Three hours. Oppenlander.

**142 Structural Roadway Design (3-0)** Properties of construction materials; design of mixes; analyses of pavement performance; structural design of pavements; highway earthwork, drainage, and construction techniques. *Prerequisites:* 141, 180. Three hours. Olson, Oppenlander.

**150 Environmental Engineering (3-0)** Basic phenomena and theoretical principles underlying water supply, air and water pollution control, and industrial hygiene. *Prerequisites:* Chemistry 1 or 5, Math. 22. Three hours. Hemenway.

**151 Water and Wastewater Engineering (2-3)** Functional design of water supply systems and wastewater management facilities; population projections, estimation of water and waste quantities, sewers, distribution systems, treatment facilities; governmental regulations. *Prerequisite:* 150. Three hours. Hemenway, Morris.

**160 Hydraulics (3-3)** Mechanics of incompressible fluids; flow meters; flow in closed conduits and open channels; elements of hydraulic machinery; laboratory studies of flow and hydraulic machinery. *Prerequisite:* Mechanical Engineering 12. Four hours. Downer.

**163 Principles of Hydrology (3-0)** Detailed discussion of occurrence, distribution, and movement of water in environment; precipitation, interception, evaporation, soil moisture, ground water, runoff, and methods of measurement. *Prerequisites:* Junior standing, one year of college science. Three hours. Downer.

**164 Fundamentals of Fluid Mechanics (3-0)** Basic principles of fluid mechanics applied to incompressible fluid statics, pipe flow, open channel flow, flow measurement and forces developed by fluids in motion. Not for credit for Engineering majors. *Prerequisites:* Math. 9, sophomore standing. Three hours. Downer.

**170 Structural Analysis I (3-3)** Analysis of statically determinate beams, frames, and trusses; expected loads; reactions; influence lines; moving loads; geometric methods for displacement calculations; introduction to matrix analysis for trusses. *Prerequisites:* 100, Computer Science 11. Four hours. Beliveau, Laible.

**171 Structural Analysis II (3-0)** Statically indeterminate structural analysis by consistent deformation and stiffness methods; determinations of deflections by energy methods; matrix analysis for frame structures and computer-aided analysis. *Prerequisites:* 170, Computer Science 11. Three hours. Beliveau, Laible.

**172 Advanced Structural Design (3-0)** Theory and design of steel structures including flexural members, axially loaded members and combined stress members; design of composite members; and plastic analysis and design. *Co-requisite:* 171. Three hours. Beliveau.

**173 Reinforced Concrete (3-0)** Analysis of stresses in

plain and reinforced concrete members; design of reinforced concrete structures; and theory of prestressed concrete. *Prerequisite:* 171. Three hours. Beliveau.

**180 Soil Mechanics (3-3)** (Same as Geology 180.) Identification, description, and physical properties of soils; characteristics of natural deposits; stress distribution, permeability, consolidation, shear strength, and stability of soils; laboratory testing of particulate systems. *Prerequisite:* 100. Four hours. Olson.

**181 Substructure Analysis and Design (3-3)** Evaluation of subsoil conditions and earth pressures; design of retaining walls, substructures for buildings and bridges, and cofferdams. *Prerequisite:* 180. Four hours. Olson.

**191, 192 Special Projects (3-0)** Investigation of special topic under guidance of faculty member. Library investigations, unique design problems, laboratory and field studies. *Prerequisites:* Senior standing, departmental permission. Three hours.

**193, 194 College Honors**

**195 Special Topics**

**210 Airphoto Interpretation (2-3)** Techniques in aerial photographic interpretation; features of stereoscopic viewing and identification of airphoto features related to landform, vegetation, drainage, soil color, topography, and cultural features. *Prerequisite:* Senior or graduate standing. Three hours. Olson.

**226 Civil Engineering Systems Analysis (3-0)** Graph theory, dynamic programming, linear programming, scheduling, resource allocation, simulation; applications to public works problems; comparison of solution models and selection of models for complex problems. *Prerequisite:* Senior or graduate standing. Three hours. Dawson.

**227 Discrete Simulation (3-0)** (Same as Business Administration 272.) Discrete simulation using monte-carlo techniques and the GPSS simulation processor; mathematical modeling of systems; control systems; validation and sensitivity analyses. *Prerequisites:* Statistics 111, 141 or 151, senior or graduate standing. Three hours. Dawson.

**230 Community Planning Techniques (3-0)** Size, spacing, and functions of cities; economic, social, and physical determinants of land-use elements; studies for urban planning; process of land use planning. *Prerequisite:* Senior or graduate standing. Three hours. Oppenlander.

**231 Community Planning Analysis (3-0)** History of urban planning; city design and appearance, quantitative methods, and social welfare planning; plan implementation; organization and administration of planning agencies; and financial planning. *Prerequisite:* Senior or graduate standing. Three hours. Downer, Oppenlander.

**232 Community Design (2-1)** Basic principles and methods of planning and designing the community; site selection; and elements such as subdivisions, industrial parks, new town, etc. *Prerequisite:* 230 or 231. Three hours. Downer, Oppenlander.

**233 Rural Planning** (See Resource Economics 233.)

**240 Traffic Engineering Characteristics (3-0)** Basic components of highway travel; traffic flow and intersection characteristics; highway and intersection capacities; performance of traffic systems; techniques for measuring traffic characteristics. *Prerequisites:* Statistics 141, senior or graduate standing. Three hours. Dawson, Oppenlander.

**241 Transportation Systems Engineering (3-0)** Interdisciplinary aspects of transportation systems; mathematical analysis and synthesis of system problems; economic considerations; fiscal studies and financial planning; administration of transportation systems. *Prerequisites:* Statistics 141, senior or graduate standing. Three hours. Dawson, Oppenlander.

**244 Urban Transportation Systems (3-0)** Transpor-



tation planning process for urban areas; inventory, use, and desire studies; travel forecasting and trip generation, distribution, and assignment; mass transit systems; terminal facilities. *Prerequisite:* Senior or graduate standing. Three hours. Oppenlander.

**249 Solid Wastes (3-0)** Significance of solid wastes from municipal, industrial, agricultural, mining; optimization and design of collection, disposal, recycle systems; sanitary landfills, incineration, composting, material recovery. *Prerequisites:* Chemistry 5, Physics 25. Three hours. Morris.

**250 Environmental Facilities Design—Water (2-3)** Design of water supply systems including source evaluation, transmission, distribution, water treatment plant design; equipment selection; wells. *Prerequisite:* 151. Three hours. Hemenway, Morris.

**251 Environmental Facilities Design—Wastewater (2-3)** Design of wastewater conveyance and treatment facilities; sewage treatment plant design; equipment selection. *Prerequisite:* 151. Three hours. Hemenway, Morris.

**252 Industrial Hygiene (3-2)** Industrial hygiene problems; effects of pollutants on health; threshold limit values; emphasis on the engineering evaluation of hazard and control techniques. *Prerequisites:* Chemistry 5, Physics 25. Three hours. Hemenway.

**253 Air Pollution (3-0)** Sources of air pollution, methods of measurement, standards, transport theory and control techniques used. Emphasis on source measurement and contaminant transport. *Prerequisites:* Chemistry 5, Math. 21. Three hours. Hemenway.

**254 Environmental Quantitative Analysis (3-3)** Chemistry and microbiology of water quality management; diffusion, equilibria, reaction kinetics, acids and bases, colloids, enzymes, bacterial physiology, pollution indicator organisms; laboratories demonstrate standard techniques. *Prerequisites:* Chemistry 1 or 5, Math. 22. Four hours. Hemenway.

**255 Water Renovation Processes – Chemical/Physical (2-3)** Theory of chemical/physical processes for treating waters and wastewaters; mass transfer, coagulation/precipitation, sedimentation, filtration, mixing, adsorption, ion exchange, membrane processes; pilot plant experimentation. *Prerequisites:* 150, 151 or graduate standing. Three hours. Morris.

**256 Water Renovation Processes – Biological (2-3)** Design theory of biological processes for treating waters and wastewaters; aerobic, anaerobic, photosynthetic processes; disinfection; pilot plant experimentation. *Prerequisites:* 150, 151 or graduate standing. Three hours. Morris.

**257 Analysis of Aquatic Systems (3-0)** Quantitative study of biological, chemical, and physical phenomena in lakes, streams, estuaries, and ground water; mathematical modeling applied to management of water quality. *Prerequisites:* 150, Math. 271 or 124 or permission of instructor. Three hours.

**258 Environmental Facilities Design – Air (2-3)** Advanced design principles for air pollution control equipment including scrubbers, precipitators, cyclones, and filters. *Prerequisites:* 150, 252 or 253. Three hours. Hemenway.

**259 Measurement of Airborne Contaminants (2-3)** Quantifying airborne contaminants from processes and ambient levels. Laboratories demonstrate calibration and measurement, stack sampling and ambient air monitoring, and specific contaminants. *Prerequisite:* 252 or 253. Three hours. Hemenway.

**260 Hydrology (3-0)** Theory of precipitation, run-off, infiltration, and ground water; precipitation and run-off data; and application of data for use in development of water resources. *Prerequisites:* 160, Statistics 141. Three hours. Downer.

**261 Open Channel Flow (3-0)** Application of the laws

of fluid mechanics to flow in open channels; design of channels and transition structures including riprap and culverts; gradually-varied flow problems. *Prerequisite:* 160. Three hours. Downer.

**263 Measurements in Applied Hydrology (2-3)** Design of hydrologic experiments; observational methods, and equipment; data reduction and handling techniques; application to the instrumentation and study of a small watershed. *Prerequisite:* 163 or 260. Three hours. Downer.

**265 Ground Water Hydrology (3-0)** Principles of groundwater hydraulics, well characteristics, aquifers, and use of numerical methods to solve ground water flow problems. *Prerequisites:* Calculus III and programming experience or permission of instructor; graduate standing or senior Civil Engineering standing. Three hours. Olson.

**270 Advanced Indeterminate Structures (3-0)** Matrix analysis of framed structures; finite element theory and application in structural mechanics and hydrodynamics; emphasis on computer applications and numerical analysis techniques. *Prerequisites:* 171, a basic knowledge of matrix algebra and computer programming. Three hours. Beliveau, Laible.

**280 Applied Soil Mechanics (3-0)** Use of soil mechanics in evaluation of building foundations, braced excavations, earth structures; lateral earth pressures, pile foundations, caisson foundations, slope stability, and construction problems. *Prerequisite:* 180. Three hours. Olson.

**282 Engineering Properties of Soils (2-3)** Soil properties that influence engineering behavior of soils including soil mineralogy, physiochemical concepts, plasticity properties, permeability, and compaction. *Prerequisite:* 180. Three hours. Olson.

**295 Special Topics** Content is dictated by expanding professional interest in newly developing, or recently developed, technical areas in which there is particular need or opportunity. Three hours. *Prerequisite:* Senior or graduate standing.

## Classics (CLAS)

### COLLEGE OF ARTS AND SCIENCES

*Professors Ambrose (Chairperson), Davison, Gilleland, Schlunk; Associate Professor B. Rodgers; Visiting Professor R. Rodgers.*

### GREEK (GRK)

There are no prerequisites to any Greek course. Students who have previously studied Greek should consult the department.

The first two semesters of a foreign language are excluded from the 45-hour limit on courses from a single department that can be counted toward the 122 hours required for the Bachelor of Arts degree.

**1, 2 Elementary Greek** Four hours. Ambrose.

**51, 52 Intermediate Greek** Review of syntax. Fall semester: Readings from Plato, Herodotus, and Euripides. Spring semester: Readings from Homer. Three hours each course. Davison, Schlunk.

**95, 96 Introductory Special Topics** Introductory courses or seminars on topics beyond the scope of existing departmental offerings. See Schedule of Courses for specific titles.

**111, 112 Greek Prose Style** Readings in literary prose analyzed stylistically and imitated in composition. Required of Greek majors. Three hours. B. Rodgers, Schlunk.

**193, 194 College Honors**

**195, 196 Intermediate Special Topics** Intermediate courses or seminars on topics beyond the scope of existing departmental offerings. See Schedule of Courses for specific titles.

**197, 198 Readings and Research**

**201 Greek Orators** Three hours. B. Rodgers. Alternate years, on demand.

**202 Greek Comedy** Three hours. Ambrose. Alternate years, 1988-89.

**203 Greek Historians** Three hours. Davison. Alternate years, on demand.

**204 Greek Tragedy** Three hours. Ambrose. Alternate years, 1988-89.

**205 Greek Philosophers** Three hours. B. Rodgers. Alternate years, on demand.

**206 Greek Epic** Three hours. Schlunk. Alternate years, on demand.

**295, 296 Advanced Special Topics** Advanced courses or seminars on topics beyond the scope of existing departmental offerings. See Schedule of Courses for specific titles.

### LATIN (LAT)

There are no prerequisites to any Latin course. Students who have had two years of high school Latin normally enroll in Latin 5 or Latin 51. Those who have had more normally enroll in Latin 101. Students with two years of high school Latin may take Latin 1 for credit only by departmental permission and only if the two years were taken two years prior to entrance into the University.

The first two semesters of a foreign language are excluded from the 45-hour limit on courses from a single department that can be counted toward the 122 hours required for the Bachelor of Arts degree.

**1, 2 Elementary Latin** For students who present less than two years of high school Latin. Four hours. Schlunk.

**5 Basic Latin Grammar Review** A complete survey of Latin grammar for students with one or two years of secondary school Latin. No credit with Latin 2. Three hours. Davison, Gilleland.

**51, 52 Intermediate Latin** Fall semester: Selections from Cicero and other prose authors. Spring semester: Selections from Vergil and Ovid. Three hours each course. Gilleland, Schlunk.

**95, 96 Introductory Special Topics** Introductory courses or seminars on topics beyond the scope of existing departmental offerings. See Schedule of Courses for specific titles.

**101, 102 Survey of Latin Literature** Selections from principal Roman authors. Three hours. Gilleland, Schlunk.

**111, 112 Latin Prose Style** Readings in literary prose analyzed stylistically and imitated in composition. Required of B.A. and B.Ed. Latin majors. Three hours. B. Rodgers, Gilleland.

#### 193, 194 College Honors

**195, 196 Intermediate Special Topics** Intermediate courses or seminars on topics beyond the scope of existing departmental offerings. See Schedule of Courses for specific titles.

#### 197, 198 Readings and Research

**203 Republican Prose** Three hours. B. Rodgers.

**204 Epic Poets** Three hours. Schlunk.

**227 Roman Lyric Poets** Three hours. Schlunk. Alternate years, on demand.

**251 Roman Letters** Three hours. B. Rodgers, Schlunk. Alternate years, on demand.

**252 Comedy** Three hours. Alternate years, on demand.

**253 Roman Oratory** Three hours. Gilleland. Alternate years, on demand.

**255 Historians of the Empire** Three hours. Davison. Alternate years, on demand.

**256 Satire** Three hours. Gilleland. Alternate years, on demand.

**271 Silver Latin** Three hours. Gilleland. Alternate years, on demand.

**295, 296 Advanced Special Topics** Advanced courses or seminars on topics beyond the scope of existing departmental offerings. See Schedule of Courses for specific titles.

### CLASSICS (CLAS)

*Courses entitled "Classics" are not foreign language courses. All readings are in English and no prior knowledge of Greek and/or Latin is required.*

**Classics 22 Etymology** Derivation of English words from Greek and Latin bases. Training in analysis of unfamiliar words, special attention to scientific vocabulary. Three hours.

**Classics 42 Mythology** Greek myth in literature, art, and music from antiquity to modern times. No prerequisites. Three hours. Spring semester. Ambrose.

**95, 96 Introductory Special Topics** Introductory courses or seminars on topics beyond the scope of existing departmental offerings. See Schedule of Courses for specific titles.

**Classics 153 Greek Drama** Three hours. Ambrose. Alternate years, 1988-89.

**Classics 154 Greek Historians** Three hours. B. Rodgers. Alternate years, 1988-89.

**Classics 155 Ancient Epic** Three hours. Davison. Alternate years, 1989-90.

**Classics 156 Greek and Roman Satiric Spirit** Three hours. Gilleland. Alternate years, 1989-90.

#### 193, 194 College Honors

**195, 196 Intermediate Special Topics** Intermediate courses or seminars on topics beyond the scope of existing departmental offerings. See Schedule of Courses for specific titles.

#### 197, 198 Readings and Research

**295, 296 Advanced Special Topics** Advanced courses or seminars on topics beyond the scope of existing departmental offerings. See Schedule of Courses for specific titles.

See also: Art 51 (Greek Art) and Art 52 (Roman Art); European Studies; General Literature 151 (Development of Prose Fiction); History 9 (Ancient Mediterranean Civilization), 105 (Ancient Near East), 106 (Greek History), and 107 (Roman History).

For The Teaching of Latin, see Secondary Education 179.

Prizes from endowed funds are awarded to outstanding graduating seniors and outstanding students in sophomore Latin.

## Communication Science and Disorders (CS&D)

### COLLEGE OF ARTS AND SCIENCES

*Professors Guitar, Lubker (Chairperson), Wilson; Assistant Professors McCauley, C. Smith; Lecturers Holmgren, Houghton.*

**10 Voice and Articulation** Principles of pronunciation, phonetic practice for the improvement of voice and diction in communication. Three hours.

**20 (F) Introduction to Disordered Communication** Survey of language, speech, and hearing disorders, emphasizing the importance of understanding such disorders as a part of the fuller understanding of human behavior. Three hours. Wilson.

**80 (F) Introduction to Speech and Hearing Sciences** Introduction to the process of normal human communication: current language theory, acoustics of speech, basic production systems, language development, and the evolution of language. Three hours. Lubker.

**90 (S) Phonetics** Linguistics, acoustics, and articulatory phonetics applied to the description of speech. Stresses use of the International Phonetic Alphabet with English, foreign languages, and disordered speech. Three hours.

**94 (S) Development of Spoken Language** Speech and language acquisition interpreted in light of current learning and cognitive theory, linguistic theory, and methods of linguistic analysis. Three hours.

**95, 96 Introductory Special Topics** Introductory courses or seminars on topics beyond the scope of existing departmental offerings. See Schedule of Courses for specific titles.

**101(F) Physiological Phonetics** Structure and function of the respiratory, phonatory, and articulation systems of the vocal tract utilized for production of speech. Models of speech production emphasized. *Prerequisites:* Nine hours of CS&D and psychology, including 80, 90. Three hours.

**105 Fundamentals of Hearing** Study of processes of human hearing emphasizing sound, acoustics, psychoacoustics, perception of speech, and the anatomy and physiology of the hearing mechanism. *Prerequisite:* 80 or permission. Three hours. Houghton, Lubker.

### 193, 194 College Honors

**195, 196 Intermediate Special Topics** Intermediate courses or seminars on topics beyond the scope of existing departmental offerings. See Schedule of Courses for specific titles.

### 197, 198 Readings and Research

**251 (F) Disorders of Speech** In-depth survey of speech disorders: articulation, fluency, voice, etc., including those with functional as well as organic etiology. Includes one hour laboratory for systematic observation and analysis of speech therapy. *Prerequisite:* 94. Four hours.

**261 (S) Disorders of Language** In-depth survey of language disorders including aspects of reception and expressive use of the language. Includes one hour laboratory as in 251. *Prerequisite:* 251. Four hours.

**262 (S) Measurement and Management of Communication Disorders** Study of the construction, application, interpretation, and implementation of tests of communicative functioning. *Prerequisite:* 251. Three hours.

**271 Audiological Assessment** Examination of basic parameters in measurement of hearing. Pure tone testing, masking, impedance, and speech evaluations. *Prerequisite:* 105 or permission of instructor. Three hours.

**272 Auditory Habilitation of Hearing Impaired Children** Survey of the handicapping effect of hearing disorders on the developing child and the principles of rehabilitation utilized for treatment of this disorder. *Prerequisites:* Fifteen credits in CS&D, including 94, 271. Three hours. Houghton.

**281 Neuroanatomical Bases of Speech and Hearing** The neuroanatomical structures which underlie the formulation, production, and perception of speech are examined and related to language and speech behavior. *Prerequisites:* Nine credits in CS&D at the 200 level. Three hours.

**287 Current Research in Language Acquisition** Recent advances in the study of child language. *Prerequisite:* 94. Three hours.

**290 Introduction to Research in Communication Science and Disorders** Study of hypothesis formation, review of research literature, and current research topics in Communication Science. Research project required. *Prerequisites:* At least nine credits at the 200 level. Three hours. (Not offered for graduate credit.)

**291, 292 Clinical Study** Supervised practicum experiences with children and adults presenting disorders of speech, hearing, and language. *Prerequisites:* 261, 262. Credit as arranged.

**293, 294 Seminar** *Prerequisite:* Permission of instructor. Variable credit.

**295, 296 Advanced Special Topics** Advanced courses or seminars on topics beyond the scope of existing departmental offerings. See Schedule of Courses for specific titles.

## Computer Science (CS)

### COLLEGE OF ENGINEERING AND MATHEMATICS

*Professors Absher, Dawson, Williams; Associate Professor Hegner; Assistant Professors Hartley, Murphy, Tehranipour, Train; Research Assistant Professor Barbour; Lecturers Douglas, Eppstein.*

**3 Computers and Their Application (2-2)** Introduction to computer systems, components, system software, editors, utilities and language processors, programming, problem solving, applications. Nonmajor credit. *Prerequisite:* Two years high school algebra. Three hours.

**11 Computer Programming I (2-2)** Structure of digital computers. Development of algorithms using flow-charting techniques. Implementation of algorithms utilizing a higher level language. *Prerequisites:* Math. 17 or 19 or concurrent enrollment in 21. Three hours.

**12 Computer Programming II (3-0)** Concepts of programming style. Continuation of programming concepts to include the development of program specifications, efficient organization and coding techniques, documentation, debugging, and testing. *Prerequisites:* 11, Math. 19, 21, or 23. Three hours.

**15 Survey of Business-Oriented Languages (3-0)** Survey course in methods of solving business problems on a computer. COBOL language, emphasizing file manipulation capabilities. Several applications problems studied. *Prerequisites:* 11 and 12, or permission of instructor. Three hours.

**101 Introduction to Computer Science (3-0)** Assembly language and machine structure. Debugging techniques. System services to include I/O services and trap handling. *Prerequisite:* 12. Three hours.

**102 Software Fundamentals (3-0)** An overview of design, concepts associated with assemblers, loaders, compilers, and operating systems. *Prerequisite:* 101. Three hours.

**103 Programming Languages (3-0)** Systematic treatment of principles underlying the features and implementation of programming languages. Contrast of traditional procedural languages and at least one nontraditional language. *Prerequisites:* 102, Math. 104. Three hours.

**104 Data Structures (3-0)** Lists, Strings, Arrays, Trees and Graphs. Storage systems and structures. Storage allocation and "garbage collection." Searching and sorting techniques. Generalized data management systems. *Prerequisites:* 103, Math. 104. Three hours.

**107 System Software Laboratory** Programming workshops and assignments that develop assemblers, loaders, compilers, and macro preprocessors. *Prerequisites:* Previous or concurrent enrollment in 102; permission of instructor. One hour.

### 193, 194 College Honors

**195 Special Topics** *Prerequisite:* Consent of instructor. Hours variable.

**200 Discrete Simulation (3-0)** (See Civil Engineering 227.) No CS graduate credit. Three hours.

**201 Operating Systems (3-0)** Supervisory and control software for multiprogrammed computer systems. Processes synchronization, interprocess communication, scheduling, memory management, resource allocation, performance evaluation, object-oriented systems, case studies. *Prerequisite:* 104. Three hours.

**202 Compiler Construction (3-0)** Practice in design and implementation of translators for ALGOL-like languages.

Regular and context-free grammars, parsing, code generation for stack and register machines. Interpreters. Run-time storage administration for block-structured languages. *Prerequisite:* 104. Three hours.

**203 Programming Languages II (3-0)** Formal specification and program correctness. Multitasking and parallelism. Object-oriented and applicative languages. Introduction to translator design. *Prerequisite:* 104. Three hours.

**207 Operating Systems Laboratory** Programming workshops and assignments that develop or modify various components of an operating system. *Prerequisites:* Previous or concurrent enrollment in 201; permission of instructor. One hour.

**222 Computer Architecture (3-0)** Architecture of computing systems. Control unit logic, input/output processors and devices, asynchronous processing, concurrency, parallelism, and memory hierarchies. *Prerequisites:* 102, Math. 104, Electrical Engineering 131. Three hours.

**223 Introduction to Formal Language Theory (3-0)** (Same as Math. 223.) Introduction to theory and applications of context-free languages. Phrase structure and context-free grammars, normal forms, pushdown automata, decision problems, power series in noncommuting variable, application to parsing. *Prerequisite:* Math. 104. CS 243 highly recommended. Three hours.

**224 Analysis of Algorithms (3-0)** (Same as Math. 224.) Introduction to both analytical and experimental techniques in algorithm analysis. Basic algorithm design strategies. Introduction to complexity theory. *Prerequisites:* 104, Math. 102 or 104, 121, 124, 173. Three hours.

**243 Introduction to Theoretical Computer Science (3-0)** (Same as Math. 243.) Introduction to theoretical foundations of computer science. Models of computation. Church's thesis and noncomputable problems. Formal languages and automata. Syntax and semantics. *Prerequisites:* 12, Math. 104. Three hours.

**294 Independent Study** Independent readings and investigation under the direction of a faculty member. *Prerequisite:* Consent of instructor. Three to six hours.

**295 Special Topics in Computer Science (3-0)** Lectures, reports, and directed readings on advanced topics. *Prerequisite:* Permission of instructor. Three hours.

## Dental Hygiene (DHYG)

### SCHOOL OF ALLIED HEALTH SCIENCES

*Associate Professors Farnham, Hill (Chairperson), Wootton; Assistant Professors Levi, Long; Instructors Grundler, McKechnie, Preston, Taoka, Venmar; Lecturers Briggs, Mercier, Rowell.*

**1 Introduction to Dental Hygiene** Principles of dental hygiene, orientation to clinical practice, and preclinical experience. Four hours. Wootton.

**2 Introduction to Clinical Dental Hygiene** A continuation of 1 with early clinical experience. *Prerequisites:* 1, Anatomy and Physiology 19. Two hours. Wootton.

**11 Oral Tissues I** Introduction to the morphology and physiology of the oral tissues. Three hours. Briggs.

**12 Oral Tissues II** Continuation of 11 emphasizing head and neck anatomy and oral embryology. *Prerequisites:* 11, Anatomy and Physiology 19. Three hours. Briggs.

**61 Radiography** Study, demonstration, and practice of fundamentals of intraoral radiographic technique. Recognition of radiographic appearance of common oral disorders. *Prerequisites:* 1, 11, Anatomy and Physiology 19 or permission. Two hours. Hill.

**62 Community Oral Health** Discussion and project participation in the planning, development, and implementation of dental health education, public health dentistry, and the private practice of dentistry. Three hours. Rowell, Long.

**91 Dental Materials** Study and manipulation of the materials commonly used in dental practice. *Prerequisites:* 2, 12 or permission. Two hours.

**141 Clinical Dental Pharmacology** Introduction to clinical pathology and pharmacological management in the treatment of dental patients. *Prerequisites:* 2, 12. Three hours. Hill, Mercier.

**143 Periodontics** Morphologic and functional aspects of the supporting structures, recognition and therapy for diseases of the periodontium. *Prerequisites:* 2, 12, Anatomy and Physiology 20. Three hours. Hill.

**146 Oral Pathology** Functional and organic diseases of the oral cavity and their clinical management. *Prerequisite:* 143 or permission. Two hours. Farnham, Mercier.

**181 Senior Clinic and Seminar** Clinical practice with patients from simple to more difficult cases both children and adults. *Prerequisites:* 2, 12, Anatomy and Physiology 20. Four hours.

**182 Senior Clinic and Seminar** Continuation of 181. *Prerequisites:* 143, 181. Four hours.

## Economics (ECON)

### COLLEGE OF ARTS AND SCIENCES

*Professors Alnasrawi, Bates, Campagna (Chairperson), Chase; Associate Professors Gedeon, Gibson, Woolf; Assistant Professors Boyd, Knodell, McCrate, Young; Instructors Ramagopal, Rizvi.*

**11 Principles of Economics** Introduction to economic concepts, institutions, and analysis, particularly as related to the macroeconomy. Open to freshman majors in economics. Sophomore standing required for nonmajors. Three hours.

**12 Principles of Economics** Study of individual economic units with particular emphasis on the tools of microeconomic analysis. For majors and others interested in more thorough understanding of economic analysis. *Prerequisite:* 11. Three hours.

**100 Statistical Methods for Economists** Data organization and presentation; construction and weighting of index numbers; analysis of central tendencies and probability; confidence intervals and hypothesis testing; measurement of correlation; simple linear regression with application to secular trend and seasonal variation of time series. Statistics 141 may be substituted for this course, but Statistics 111 may not. *Prerequisite:* 11; *Pre- or corequisite:* 12. Three hours.

**101 Macroeconomic Theory** Keynesian and post-Keynesian theories of economic development; government policies in relation to the problems of employment, stability, and growth in developed economies. *Prerequisite:* 12. Three hours.

**102 Microeconomic Theory** Analysis of consumer demand, supply, market price under competitive conditions and monopolistic influences, and the theory of income distribution. *Prerequisite:* 12. Three hours.

**111 Money and Banking** Commercial and central banking with special attention given to the Federal Reserve system, monetary theory and policy. *Prerequisite:* 101. Three hours.

**116 Public Policy** Revenues and expenditures of federal, state, and local governments and intergovernmental relationships; the effects of expenditures and taxation upon individuals, business institutions, and the national economy. *Prerequisite:* 102. Three hours.

**122 Industrial Organization** The structure, conduct, and performance of U.S. industry and appraisal of its economic efficiency and social impact, including governmental policies. *Prerequisite:* 102. Three hours.

**141 Labor Economics** Labor as an economic factor, the labor force, wages, productivity, and income. Wage and hour legislation, social security, and unemployment insurance. *Prerequisite:* 102. Three hours.

**150 International Trade and Finance** Theories of international values, adjustment of international balances, foreign exchange, international aspects of money and banking, and tariffs. *Prerequisite:* 102. Three hours.

**154 Economic Development** Theories of economics growth applied to developing countries of the contemporary world including the political and social determinants of economic progress. *Prerequisite:* 101. Three hours.

**170 Evolution of Capitalism** Origins and development of capitalism; their social-economic institutions and their transference from Western Europe to North America. *Prerequisite:* 12. Three hours.

**171 Survey of American Economic History** Survey of economic history of the U.S. from colonial origins through early 20th century, emphasizing economic and institutional changes and events promoting economic growth and development. *Prerequisite:* 12. Three hours.

**185 Comparative Economic Systems** Major economic systems of mixed capitalist and socialist variety, their theoretical models, basic institutions and policies from a comparative point of view. *Prerequisite:* 12. Three hours.

**193, 194 College Honors** Three hours.

**195, 196 Intermediate Special Topics** Intermediate courses or seminars on topics beyond the scope of existing departmental offerings. See Schedule of Courses for specific titles.

*All 200-level courses have minimum prerequisites of 101, 102, and Statistics 141. Any prerequisites noted in the following course descriptions are in addition to the noted minimum.*

*Note: No Economics courses are offered for graduate credit.*

**200 Econometrics** A combination of economic theory, mathematics, and statistics for testing of economic hypotheses and developing economic models. Three hours.

**201 Advanced Macro and Monetary Theory** Analysis of classical Keynesian and modern macroeconomic models; micro and macro demand for and supply of money; portfolio choice and the influence of financial intermediaries. Three hours.

**202 National Economic Policies** Macroeconomic problems faced by the U.S. economy from the Great Depression to the present and the policies proposed to solve them. Three hours.

**223 Antitrust and Regulation** Theories, history, and policies of government's role in U.S. economy, emphasizing antitrust laws and decisions and federal regulatory programs. Three hours. Alternate years.

**230 Mathematical Economics** Basic mathematical techniques employed by economists; use of maximum and minimum criteria and optimization problems; partial and general equilibrium analysis; comparative statics; some dynamic analysis. *Prerequisite:* Math. 19.

**241 Human Resources** Labor economics, economic demography, and economic history of female participation in household and market production. *Prerequisite:* 141. Three hours.

**242 Labor-Management Relations** Economic influences of unionization. The grievance process, arbitration, and labor relations laws. *Prerequisite:* 141. Three hours. Alternate years.

**254 Topics in Economic Development** Economic analysis of selected areas of the world, or selected topics in

economic development. *Prerequisite:* 155. Three hours.

**256 Problems of the International Economy** Examination of some of the stresses and strains of the world economy including inflation, growth, role of multinational corporations, external debt, and terms of trade. *Prerequisite:* 150. Three hours. Alternate years.

**260 Income, Wealth, and Welfare** Analysis of the distribution of income and wealth and policies which affect them. Three hours.

**265 Urban and Regional Economics** Economic analysis applied to the problems of cities, states, and regions. Three hours.

**268 Economics of Energy** International and domestic aspects of energy policies as they relate to output and prices. Three hours.

**271 Topics in American Economic History** In-depth analysis of selected historical topics, emphasizing the use of economic theory to understand and explain historical events. Three hours.

**275 Development of Economic Thought Through Keynes** Development of economic ideas. The Pre-Classical, Classical, Socialist, Neoclassical, Keynesian Schools, and individual theoreticians. Three hours. Alternate years.

**276 Development of Economic Thought After Keynes** Historical development of the mainstream Keynesian paradigm and its relationship to alternative frameworks of theory, method, analysis, and ideology. *Prerequisite:* 275 or 201. Three hours. Alternate years.

**277 Marxian Economic Theory** Examination of the economic method of Karl Marx concentrating on the labor theory of value, accumulation, crisis, and realization problems. Three hours.

**281 The Soviet and Eastern European Economies** Analysis of the economic development, structure, performance, and direction of the Soviet and related economies. Three hours.

**295, 296 Advanced Special Topics** Advanced courses or seminars on topics beyond the scope of existing departmental offerings. See Schedule of Courses for specific titles.

**297 Readings and Research** Independent study with permission of supervising professor prior to registration.

**299 Departmental Honors** By invitation only.

## Education (ED)

### COLLEGE OF EDUCATION AND SOCIAL SERVICES

*Professors Abruscato, Agne, Carlson, Conrad, Coward, Ducharme, Fox, Gobin, Grams, Hanley, Hunt, Leggett, McKenzie, Nash, Nevir, Peterson, Rath, Ripa, Shiman, Tesconi; Associate Professors Barbour, Burrell, Christensen, Erb, Fitzgerald, Goldhaber, Griffin, Hasazi, Holmes, Johnston, Lang, Larson, Letteri, Meyers, B. Nichols, Paolucci-Whitcomb, McNeil, Ponzo, Rathbone, E. Rathbone-McCuan, Sandoual, Shelton, Stevenson, Thompson, Williams; Assistant Professors Bright, Bryant, Chase, Clarke, Greig, Hood, Jameson, Lambert, Neito, Pahnos, Reagin, Roberts; Lecturers Burdett, Liggett, Watson; Extension Associate Professor E. Nichols.*

*Any information concerning course instructor may be obtained from department chairperson at the beginning of each semester.*

*The College of Education and Social Services offers the following courses on a program basis. Departmental permission is required for enrollment.*

**55 Special Topics I** Designed so that its content and

structure may accommodate special issues not especially appropriate within the boundaries of an existing course. Open to undergraduates. Two to six hours.

**154 Special Topics II** Lectures, readings, or projects relating to contemporary areas of study. Open to upperclassmen. Two to six hours.

**181 Student Teaching** Teaching in elementary or secondary schools under guidance of cooperating teachers, principals, and college supervisors. For most undergraduates this is a full-time, 16-week, 12-credit experience during a semester. *Prerequisites:* Acceptance in a teacher education program, acceptance by the Director of Field Experience. Variable credit, three to 12 hours.

**197 Readings and Research** Individual research problem or directed reading in an area of special interest to the student. *Prerequisite:* Permission of instructor. Variable credit, one to four hours. Course may be repeated up to eight hours.

**200 Contemporary Issues** Designed so that its content and structure may accommodate special issues not especially appropriate within boundaries of an existing course. *Prerequisite:* Twelve hours in education and related areas. Two to six hours.

**295 Laboratory Experience in Education** Supervised field work designed to give students experience in specialized areas for their professional development. *Prerequisite:* Permission of Coordinator of Professional Laboratory Experiences. Credit as arranged.

#### GENERAL EDUCATION — EDSS

**1 Schooling, Learning, and Society** Introduction to issues and problems in American education: schools and learning, professional careers, individuals in systems, characteristics of learners. Required readings and papers. Non-CESS students only. Three hours.

**2 An Introduction to Learning and Teaching in the School Context** The students develop an initial understanding of the educational profession through examination of its essential elements. Students analyze relationship between teaching and learning within culture of the school. *Prerequisite:* for EDSS 24 and 56. Three hours.

**24 Learners and the Learning Process** Distinctions among dominant theories of learning and development. Learning theories applied to selected issues derived from context of schools. Students work with individual learner in appropriate setting. *Prerequisite:* EDSS 2. Three hours.

**56 Teachers and the Teaching Process** Students examine lives of teachers, demands of the profession, and selected models of teaching. Student observation of teachers in appropriate settings and knowledge of learning and development. *Prerequisite:* EDSS 2; EDSS 24 recommended. Three hours.

**60 An Introduction to Helping Skills for the Educator** Examines phenomenon of "helping" in American society within its sociological, cultural, economic, political, and educational contexts. Emphasis on how helping professionals function both to help and to hinder clients in society. Three hours.

**193 Environmental Education** Philosophy, concepts, and teaching-learning strategies of environmental education. *Prerequisite:* Three hours in education or permission of instructor.

**207 The University and Third World Development** Examination of the role of educational policies on urbanization vs. ruralization in the human capital formation process of third world countries. *Prerequisites:* Six hours of political science, history, geography, or economics, or permission of instructor. Three hours. (Not offered for graduate credit.)

**208 Women and Their Critical Life Choices** An interdisciplinary examination of feminist thought and its relationship to the decision-making process for contemporary women. *Prerequisites:* Junior standing, six hours of course work in women's studies.

**211 Educational Measurements** Essential principles of measurement in education. Topics include validity, reliability, principles of test construction, item analysis, and analysis of standardized tests as they apply to classroom. *Prerequisite:* Twelve hours in education and related areas. Three hours.

**238 Teaching for Global Awareness** Important value issues — peace and prevention of war, social and economic justice, environmental harmony — and their relationship to global problems. Curriculum materials developed and shared. Ways of teaching about global issues. Links between local and global concerns. *Prerequisite:* Twelve hours of education and related areas. Three hours.

**248 Educational Media** Modern instructional aids, theory and practice; educational media related to psychology of teaching and learning. *Prerequisite:* Twelve hours in education and related areas. Three hours.

**261 Current Directions in Curriculum and Instruction** Current trends, issues, literature, programs, and organizational activities in fields of curriculum and instruction emphasizing areas of individual concern. Focus on elementary and secondary school levels. *Prerequisite:* Twelve hours in education or equivalent. Three hours.

#### LEARNING STUDIES — EDLS

**43, 44 Learning Theory** Studies in behavior emphasizing cognitive, emotional, and psychological development. Examination of views of learning styles and developmental processes. Non-CESS only. *Prerequisite:* Three hours in education or permission of instructor. Three hours.

**45, 46 Learning and Human Development** The developing individual; psychology of learning with particular application to human development; measurement and evaluation of learning and development; opportunities for related field experiences. *Prerequisite:* Three hours in education or permission of instructor, 45 for 46. Three hours.

**212 Child and Adolescent Psychology** Examination of children and adults as emerging individuals and impact of sociocultural ethics, values, and institutions on that individual. Themes include human needs, values, self concept, personal freedom, bureaucratic society, cross-cultural issues; as relative to children and youth. *Prerequisite:* Twelve hours in education and/or related areas. Three hours.

**237 The Middle School Child: Education and Social Implications** Intensive analysis of unique problems faced by middle school child. Middle school organization, curriculum, teaching procedures, and family life adjustments examined in depth. *Prerequisite:* Twelve hours of education or psychology or permission of instructor. Three hours. (Not offered for graduate credit.)

#### FOUNDATIONS — EDFS

**190 Approaches to Education** Senior Seminar. Ideas and values, historic and contemporary, emphasizing ideological bases of American education. Students develop new perspectives as guide toward resolving some crucial issues of our time. *Prerequisites:* Senior standing, three hours in education or permission of instructor. Three hours.

**204 Seminar in Educational History** Struggles for Freedom and Equality. Selected topics in history of education. Education in democratic and authoritarian social orders. Discussions and research around such topics as education of women, black heritage, American higher education in transition. *Prerequisite:* Twelve hours in education and related areas or permission of instructor. Three hours.

**205 History of American Education** Educational principles and practices in the U.S. as they relate to main currents of social history. Discussions focus on key ideas of historic and contemporary significance. *Prerequisite:* Twelve hours in education and related areas or permission of instructor. Three hours.

**206 Comparative Education** The study of educational policy and practice in selected countries. Focus on the making of citizens, the achievement of equity goals, and related development issues in countries such as China, USSR, Kenya/Tanzania. *Prerequisite:* Twelve hours in education and related areas. Three hours.

**209 Introduction to Research Methods in Education and Social Services** Seminars and research projects introduce students to methods of historical, descriptive, experimental, quasi-experimental, field studies, and survey research. Three hours.

**252 Seminar in Aesthetic Education** Critical examination of aesthetic values in contemporary society. The aesthetic quality of natural and built environments with implications for present and future educational practice given special attention. *Prerequisite:* Twelve hours in education and related areas. Three hours.

**255 School as a Social Institution** Examination of the school and related social institutions, with particular focus on: social class, race, and ethnicity, socialization, role of the family, management of knowledge, and social change. *Prerequisite:* Twelve hours in education and related areas. Three hours.

### ELEMENTARY EDUCATION — EDEL

**4 Child and Community** Supervised experiences with children's groups in the community. Students plan a schedule enabling them to have blocks of time, such as a morning or afternoon, free of regular classes. *Prerequisite:* Sophomore standing. Two hours.

**115 Analysis of American Primary Schools** Includes readings on the American school, observation in several schools, instruction work with children, and seminars about interns' experiences in the schools. *Prerequisite:* Three hours in education or permission of instructor. Three to six hours.

**121 Reading and Language Arts** Principles underlying teaching reading at elementary level. Materials and methods; reading readiness; development of vocabulary; word analysis and comprehension skills; reading in content area. *Prerequisites:* Elementary majors, junior standing. Three hours.

**122 Developmental Reading** Current practices and controversial issues relative to teaching reading. Study of recent innovations, methods, materials, and assessment techniques. *Prerequisites:* Elementary majors, 121, 134. Three hours.

**134 Children's Literature and Language Arts** Appreciation, evaluation, and selection of children's literature in the Language Arts program; development of oral and written expression. *Prerequisites:* Elementary majors, junior standing. Three hours.

**136 Introduction to Drama in Education** Workshop in dramatic activities for elementary children. Creative expression based on selections from children's literature as well as plays and vignettes written by class participants. *Prerequisite:* 134. Three hours.

**138 Analysis of Problems in Reading and Related Language Instruction** Introductory course in analysis and evaluation of reading and writing difficulties; critiquing assessment instruments; interpretation of test data; strategies for improvement. *Prerequisite:* 122. Three hours.

**139 Laboratory Experience in Reading and Related Language Instruction** Introductory course in prevention and correction of reading and writing difficulties; methods and materials for remediation. Involvement with students required. *Prerequisite:* 138 or permission of instructor. Three to six hours.

**144 Teaching Science and Social Studies** Teaching methods, curriculum planning in social studies and science for primary through middle school. Variety of nationally developed curriculum projects examined and micro-taught. Wide

variety of instructional activities and strategies considered. *Prerequisite:* Three hours in education or permission of instructor. Three hours.

**160 Teaching Mathematics and Critical Thinking in the Elementary School** Investigation of modern approach to mathematics emphasizing instructional strategies, curriculum resources, and problem solving. Emphasis on a manipulative approach to teaching mathematics in elementary school. *Prerequisites:* Math. 15 and 16 or permission of instructor. Three hours.

**186 Seminar for Teachers** Instructional support to interns during student teaching experience. Weekly meetings and personal conferences centering around difficulties and successes of student teaching held in various field sites. *Prerequisites:* Concurrent enrollment in Student Teaching. Three hours.

**222 Improvement of Reading Instruction in the Elementary School** Analysis of philosophies, program, and instructional practices for teaching reading. Examination and evaluation of basal textbook, individualized and specialized reading programs. *Prerequisites:* Twelve hours in education and/or related areas including introductory course in reading or permission of instructor. Three hours.

**234 Literature and Language for Children and Youth** Characteristics, interests, and reading habits of children and young people; criteria for selection and evaluation of literature: organizing book unit for teaching literature and for content areas emphasizing development of oral and written expression. *Prerequisite:* Twelve hours in education and related areas or consent of instructor. Three hours.

**241 Science for the Elementary School** Examines a number of elementary school science programs. Emphasis on methods and materials relating to construction and use of science units for children in grades K-6. *Prerequisite:* Twelve hours in education and related areas and permission of instructor. Three hours.

**244 Social Studies in the Elementary School** Study of literature, research, and problems in teaching social studies in the elementary school. *Prerequisite:* Twelve hours in education and related areas. Three hours.

**256 Methods and Materials in Elementary School Mathematics** Evolution of mathematical concepts and notations, meaning of numbers and number systems, theory underlying fundamental operations, metric measurement, analysis of modern approach to mathematics. Emphasis on manipulative approach to teaching mathematics in elementary school. *Prerequisite:* Twelve hours in education and related areas. Three hours.

**270 Kindergarten Methods and Organization** Objectives, organization, curriculum, methods and materials, and relationships of kindergarten to Head Start and other preschool experiences. *Prerequisite:* Twelve hours in education and related areas. Three hours.

**271 Kindergarten Education With Laboratory Experiences** To acquaint the prospective kindergarten teacher with educational research conducted by Piaget, Bruner, Montessori, and others with experiences provided for working with children of kindergarten age. *Prerequisite:* Twelve hours in education and related areas. Three hours.

### SECONDARY EDUCATION — EDSC

**6 Participation** Minimum of 30 clock hours of observation and participation in classroom work in formal learning environment. Weekly seminars on campus. Students plan schedule enabling them to have blocks of time, such as morning or afternoon, free of regular classes. *Prerequisites:* Sophomore standing, acceptance by Coordinator of Professional Laboratory Experiences. Two hours.

**67 Contemporary Secondary Schooling** Purposes, organization, curricular and instructional approaches, and his-



torical roots of secondary schools. Contrasting belief and value perspectives. Proposals for change. Developing one's own orientation and aims in secondary education. *Prerequisite:* EDSS 56 or permission. Three hours.

**137 Reading in the Secondary School** Principles underlying teaching of reading in content areas; materials of instruction; development of word recognition, vocabulary, comprehension, and study skills. *Prerequisite:* Junior standing. Three hours.

**138 Analysis of Problems in Reading and Related Language Instruction** Analysis and evaluation of reading and writing difficulties in content areas; critiquing tests and interpreting data, strategies for improvement. *Prerequisite:* 137. Three hours.

**178 Secondary Methods and Procedures** Prepares students for teaching in secondary school. Micro-teaching, role playing, classroom simulation, analysis of classroom behavior, and preparation of individualized materials. *Prerequisite:* Acceptance in a teacher education program. Three hours.

**179 Secondary Methods and Procedures in Special Subject Areas** (Latin, mathematics, romance languages, and social studies.) *Prerequisites:* Prior or simultaneous enrollment in 178, acceptance in a teacher education program. Variable credit, two or three hours; i.e. Latin, three hours; mathematics, three hours; romance language, three hours; social studies, three hours. (English majors enroll in 282.)

**217 Secondary School Curriculum** Principles and problems in curriculum development. Analysis of recent curricular innovations in American secondary schools. *Prerequisite:* Twelve hours in education and related areas. Three hours.

**223 Reading Programs in Secondary Schools and Colleges** Relationship of reading to learning; study of organization, instructional procedures, and materials for developing reading improvement programs for secondary and college students; reading in content areas. *Prerequisite:* Twelve hours in education and/or related areas or consent of instructor. Three hours. (Also offered for undergraduates under 137.)

**225 Teaching Social Studies in Secondary Schools** Multiple teaching modes, questioning techniques, micro-teaching laboratory, analysis of historical content to determine students' prerequisite cognitive skills and processes for construction of historical scenarios. *Prerequisite:* Twelve hours in education and related areas. Three hours.

**227 Teaching Science in Secondary Schools** Consideration of science curricula for grades 7-12. Teaching science as problem solving, research in science teaching, evaluation strategies, instructional techniques, and affective education through science. *Prerequisites:* Twelve hours in education and related areas, permission of instructor. Three hours.

#### AGRICULTURAL AND NATURAL RESOURCE EDUCATION

#### HOME ECONOMICS EDUCATION

#### INDUSTRIAL ARTS/TECHNOLOGY EDUCATION

#### TRADES AND INDUSTRY EDUCATION

Courses related to these four programs are offered through the Vocational Education and Technology Department and information about them can be found on pages 180-182.

#### ART EDUCATION — EDAR

**140 Foundation Studio for Elementary Education Majors** Students select a foundation studio course (Art 2,3 or 4) from those sections designated each semester on the course schedule. See course descriptions listed under Art. Three hours.

**141 Practicum in Field Experience** Student works as teaching assistant to faculty member in foundation, studio, advanced studio, art history, or museology depending on interest

and capabilities. *Prerequisites:* Senior standing, permission. Four hours.

**177 Curriculum and Practice in Elementary Art** Study and implementation of curriculum in elementary school. Students work directly in an elementary classroom. Lectures and discussions. *Prerequisites:* Eighteen hours studio art, junior standing. Four hours.

**183, 184 Seminar: Current Issues in Art and Education** Research and discussion of issues relevant to contemporary art and the teaching of art. *Prerequisite:* Senior standing or permission, 12 hours in art and/or related areas. Three hours.

#### MUSIC EDUCATION — EDMU

*The Music Department offers a number of pedagogy courses in specific musical areas. All are open to nonmajors by permission of the instructor. See Music course listings.*

**181 Music for Elementary Teachers** Development of musical skills, understandings, and attitudes pertinent to the teaching of music in elementary classroom. *Prerequisite:* Sophomore standing. Three hours.

**240 Musical Creativity in the General Music Class** Designing a course of study for the general music class. Developing musical concepts and perception through individual differences. Aural approach through class performance on recorders. *Prerequisite:* Undergraduate major in Music Education or permission of instructor. Three hours.

**243 Recent Trends in Music Education** Study of recent thought and practices in music education. Examination of current trends. *Prerequisite:* Undergraduate major in Music Education or permission of instructor. Credit variable, one to four hours.

**253 Practicum in Music Education** Current methodology in music education for music specialist and classroom teacher. Each year emphasis in a different area of concentration. *Prerequisites:* Undergraduate major in Music Education or Elementary Education and teaching experience or permission of instructor. Credit variable. Course may be taken for one to four hours each semester, may be repeated up to eight hours.

**281 Elementary Music Education Methods** Methods and materials in the teaching of vocal and instrumental music in elementary schools. *Prerequisite:* Music Education major status or instructor's permission. Three hours.

**282 Secondary Music Education Methods** Methods and materials in the teaching of vocal and instrumental music in secondary schools. *Prerequisite:* Junior standing in Music Education. Three hours.

**290 Basic Concepts in Music Education** Disciplinary backgrounds; historical and philosophical foundations; fundamental considerations of the functions of music in the schools; development of a personal philosophy. Three hours.

#### SPECIAL EDUCATION-RESPONSIVE TEACHER PROGRAM — EDRT

**3 Introduction to Special Education** Overview of causes, behaviors, and educational programs of those with psychological and educational needs different from those of the general population. Three hours.

**53 Providing for Exceptional Individuals** Public Law 94-142, Education for all Handicapped Children Act (1975), and its implications for classroom teachers. Review of components of Individualized Education Program (IEP) required for every child receiving special education. Required practicum in neighboring school. Three hours.

**100 Specifying Minimum Objectives for Basic Skills** Concept of minimum instructional objectives and their use for developing language, arithmetic, and social interaction curricula. Observation of selected public school classrooms using



basic skills minimum objectives. *Prerequisite:* Three hours in education or permission of instructor. Three hours.

**150 Classroom Management Procedures** Survey of researched procedures for managing children eligible for special education services within regular and special classrooms, and home and institutional environments. Students develop, apply, and evaluate specific procedures in simulated and classroom environments. *Prerequisite:* Three hours in education or permission of instructor. Three hours.

**151 Special Education Methods I** Modules introduce students to historical issues and current trends in special education, concept of minimum instructional objectives and use for developing language, arithmetic, and social interaction curricula; analysis of specific teachers' and childrens' behavior in classroom setting. *Prerequisite:* Acceptance into Responsive Teacher Program. Credit variable, three to six hours.

**152 Special Education Methods II** Modules facilitate the Responsive Teacher Practicum. Procedures for dealing with special education children; measurement systems to assess pupil progress; peer tutoring techniques; program development for children with learning deficits; norm and criterion reference testing; evaluation of learning environments. *Prerequisites:* Acceptance into Responsive Teacher Program, concurrent enrollment in 160. Credit variable, three to six hours.

**155 Measurement and Implementation of Minimum Objectives for Basic Skills** Specification and implementation of measurement system to assess pupil progress in language, arithmetic, and social interaction curricula. Practicum applications of measurement system required for at least one child eligible for special education services in regular or special classroom. *Prerequisite:* 100. Three hours.

**160 Responsive Teacher Practicum** Practicum in public school or institution designed to provide opportunities for application of data-based model of education to serve children eligible for special education services. Time required: four hours, Monday through Thursday mornings, plus travel time. *Prerequisites:* Acceptance into Responsive Teacher Program, concurrent registration in 152. Six hours.

**165 Seminar in Special Education** Students develop personal vitae and materials describing experiences and achievements during college career. Interviews with school administrators, classroom teachers, and peers provide opportunities to survey positions and careers in special education. *Prerequisites:* Acceptance into Responsive Teacher Program or permission of instructor. Seniors. One hour.

**201 Foundations of Special Education** Examination of historical and current trends in treatment of handicapped individuals, including effects of litigation, legislation, and economic considerations on educational and residential service delivery systems. *Prerequisite:* Twelve hours in education and related areas or permission of instructor. Three hours.

**216 Instruction for Mildly Handicapped Individuals I** Introduction to curriculum for instruction of children with learning disabilities, mental retardation, and behavior disorders emphasizing objectives, assessment, task analysis, curriculum, and evaluation. *Prerequisite:* Permission of instructor. Three hours.

**224 Introduction to Behavioral Principles of Education** Analysis of specific teachers' and childrens' behavior in classroom setting that function to facilitate or impede attainment of educational goals. Emphasis on application of basic behavioral principles in regular class setting that improve student's academic and social behaviors. *Prerequisites:* Twelve hours in education and related areas, permission of instructor. Juniors and seniors. Three hours.

## EARLY CHILDHOOD AND HUMAN DEVELOPMENT — ECHD

### 3 Introduction to Early Childhood and Human De-

**velopment I** First of three seminars designed to introduce students to the concepts and practices of the discipline. Emphasis on methods of studying individuals and families. *Prerequisite:* Majors only. Two hours.

**4 Introduction to Early Childhood and Human Development II** Second of three seminars designed to introduce students to the concepts and practices of the discipline. Emphasis on the applications of research findings. *Prerequisites:* 3 or permission. Two hours.

**7 Introduction to Field Work in Early Childhood and Human Development** Third of three seminars introducing concepts and practices of the discipline. Emphasizes supervised field experience in a child and/or adult developmental service setting. *Prerequisite:* 4. One hour.

**20 Aging: Change and Adaptation** (Same as Nursing 20 and Sociology 20.) Individual and social meanings of aging and old age; physical, physiological, psychological, and sociological changes accompanying aging; individual, family, community, and societal adaptations to aging. Three hours. Brown, Cutler.

**60, 61 The Context of Human Development** The impact of the family, community, and various agencies, systems, and conditions within society upon the developing individual. Three to four hours.

**62 Adolescent Development** Physical growth, physiological, psychological, and social development in adolescence. Emphasis on interrelationships of these processes and the developing personality. *Prerequisites:* Sophomore standing, Psychology 1. Three hours. Shelton.

**63 Child Development** The biological, psychological, and social growth and development of children and their relationships with family, peers, and institutions. *Prerequisites:* Sophomore standing, Psychology 1. Three hours. Goldhaber, Jameson, Shelton.

**64 Maturing and Aging** Physical change, physiological, social development during the maturing years and older age. Interrelationships between these processes stressed. *Prerequisites:* Sophomore standing, Psychology 1. Three hours. Grams.

**65 Human Relationships and Sexuality** Sexual responsibility and the biological, social, psychological growth, and development of human beings in terms of sex role identity. Three hours. Barbour.

**80, 81 Human Development** A two-semester comprehensive survey of development across the life cycle. Three hours lecture and one hour optional discussion each semester. *Prerequisite:* 80 for 81. Six to eight hours. Goldhaber, Shelton.

**82 Creative Curriculum Activities for the Early Childhood Years I** Planning interdisciplinary program materials for children on an individual and group basis using movement, graphic, plastic, language arts. *Prerequisite:* Permission of instructor. Three hours.

**83 Creative Curriculum Activities for the Early Childhood Years II** Planning interdisciplinary program materials for children on an individual and group basis emphasizing mathematics, the natural ecology, and general sciences. *Prerequisite:* 82 in preceding semester or permission of instructor. Three hours.

**163 The Emerging Family** Development of parents and children in various stages of the family life cycle and various emerging family forms. *Prerequisite:* Sophomore standing. Three hours.

**164 Parent-Child Relations** Interpersonal relations of adults and children and the application of underlying principles in parent education and family consulting. *Prerequisite:* 63 or consent of instructor. Three hours. Jameson, Nichols.

**165 Practicum: Facilitating Human Sexuality Discussion Groups** Designed to train participants to become effective facilitators of discussion groups dealing with human

relationships and sexuality. *Prerequisites:* 65, sophomore standing, permission. Three hours. Barbour.

**184 Early Childhood Programs** An active examination of present day early childhood programs in relationship to their historical development from early history. Three hours. Jameson.

**185 Cognitive and Personality Development in Aging** Perception, memory, learning, and creativity in old age. Continuity and change in personality during the later years. *Prerequisite:* 80, 81 or 20 or permission of instructor. Three hours. Grams.

**187 Field Practicum** Supervised teaching in accredited early childhood facilities licensed or approved by responsible boards. *Prerequisite:* Permission. Eight hours. Jameson.

**188 Prepracticum Internship** Administration and planning for an early childhood development center. *Prerequisites:* Early Childhood major, permission. Three hours.

**189 Early Childhood Practices** Supervised planning and conducting the Early Childhood Laboratory Center. Integrated Readings and Research, Early Childhood Seminar, and Curriculum Workshop. *Prerequisite:* Permission. Fifteen hours. Goldhaber.

**195 Special Topics** Lectures, laboratories, readings, or projects relating to contemporary areas of study. Enrollment may be more than once, accumulation up to 12 hours. *Prerequisite:* Varies with course.

**260 Family Ecosystem** Family viewed in and as an environment for human development. The family ecological approach applied to practical family concerns. *Prerequisite:* Senior standing or permission of instructor. Three hours. Nichols.

**263 Advanced Child Development** Survey of professional literature in child development with special emphasis on influence of early life experiences throughout the life cycle. *Prerequisite:* 80, 81 or equivalent. Three hours. Goldhaber.

**264 Contemporary Issues in Parenting** Contemporary cultural factors that influence adult lifestyles and their relationship to successful parenting. *Prerequisite:* Nine hours in human development or permission of instructor. Three hours.

**265 Teaching Human Development** Designed for individuals who teach or plan to teach human development. Emphasis on group-building skills and interpersonal relationships. *Prerequisites:* Six hours in human development, permission of instructor. Three hours. Barbour.

**266 Seminar in Human Development** Intensive study of issues in human development and their application in a wide variety of professional areas. May be taken more than once up to a maximum of 12 hours. *Prerequisites:* Junior standing, nine hours of human development or equivalent. Three hours.

**281 Infancy** Development and rearing from conception to 18 months and their relationship to subsequent development. *Prerequisites:* Nine hours in human development, nutrition, and physiology or biology or permission of instructor. Three hours. Shelton.

**282 Seminar in Physical Development and Health in Later Life** Physical manifestations of senescence, anatomical and physiological development, longevity, vitality, health care, nutrition, chronic conditions and disability. *Prerequisite:* 185 or permission. Three hours. Grams.

**283 Personal and Family Development in Later Life** Cognitive development, intellectual performance, work and achievement, retirement and leisure, personal development, self-esteem, coping mechanisms, dying, couples, intergenerational and kinship issues. *Prerequisite:* 185 or permission. Three hours. Grams.

**284 Public Policy and Programs for Elders** Demography of aging, social institutions and roles, policy and program implementation, income maintenance, housing, health

care, social services, transportation, legal and political issues. *Prerequisite:* 185 or permission. Three hours. Grams.

**291 Special Problems** Reading, discussion, and special field and/or laboratory investigations. *Prerequisite:* Departmental permission. Students may enroll more than once up to 12 hours. One to six hours.

**295 Special Topics** Lectures, laboratories, readings, or projects relating to contemporary areas of study. Enrollment may be more than once, accumulation up to 12 hours. *Prerequisite:* Departmental permission.

**296 Field Experience** Professionally-oriented field experience under joint supervision by faculty and community representative, credit arranged up to 15 hours. *Prerequisite:* Departmental permission.

## PHYSICAL EDUCATION — EDPE

**21 Foundations of Physical Education** Review of historical, philosophical, and scientific foundations as a basis for physical education. Study of vocational opportunities associated with physical education as a profession. Three hours.

**23 Advanced First Aid and Emergency Care** To meet the needs of individuals who are in a position to provide first aid and emergency care frequently. Red Cross certification for successful performance in Advanced First Aid Emergency Care. *Prerequisite:* Permission of instructor. Three hours.

**26 Water Safety Instructor** Advanced performance skills in swimming, diving, survival, and rescue techniques. Theory and practice in techniques of teaching aquatic skills. Red Cross certification as Water Safety Instructor or Instructor for Beginning Swimming. *Prerequisite:* Current Red Cross Life-saving Certificate. Two hours.

**32 Recreational Sports Officiating** Basic techniques and skills of rule interpretation for officiating recreational sport competition. Two hours.

**54 History, Philosophy, and Trends in Recreation** Review of chronological history of evolution of recreation movement; examination of past and emerging theories and philosophies of recreation and leisure; exploration of trends in recreation and leisure and probable impact on our life styles. Three hours.

**100 Teaching Physical Education in the Elementary School** Planning, organization, and practice skills appropriate for teaching movement patterns to children aged 4-12. *Prerequisite:* Six credits in elementary education. Three hours.

**104, 105 Physical Education Teaching Experience (Petex)** Experience-based course sequence emphasizing relationship of motor development to learning. Includes age level needs and appropriate physical education activity sequences. First semester: grades K-3; second semester (105): grades 4-6. *Prerequisites:* 23 or 157, junior standing. Five hours.

**122 Coaching Basketball** Experiences include theory and technique in coaching basketball, as well as the organization and conduct of a basketball program, defensive and offensive strategies. *Prerequisite:* Skill competency in basketball, sophomore standing or permission of instructor. Three hours.

**123 Coaching Baseball/Softball** Theory and technique of coaching interscholastic baseball and softball. Includes practice, game, and schedule organizations. *Prerequisites:* Skill competency in baseball/softball, sophomore standing or permission of instructor. Two hours.

**124 Coaching Track** Analysis and practice of the skills, techniques, and knowledge involved in coaching interscholastic track. *Prerequisites:* Skill competency in track, sophomore standing or permission of instructor. Two hours.

**125 Coaching Soccer** Theory and technique of coaching interscholastic soccer. Includes practice, game and schedule organization. *Prerequisites:* Skill competency in soccer, sophomore standing or permission of instructor. Two hours.

**126 Coaching Gymnastics** Analysis and practice of skills, techniques, and knowledge involved in teaching and coaching gymnastics. *Prerequisites:* Skill competency in gymnastics and aquatics, sophomore standing. Two hours.

**127 Coaching Swimming** Knowledge, analysis, and practice of skills and techniques involved in coaching swimming. *Prerequisite:* Skill competency in swimming, sophomore standing or permission of instructor. Two hours.

**128 Coaching Field Hockey** Theory and technique of coaching interscholastic field hockey. Includes skill and game analysis; practice, game, and schedule organization; and development of a coaching philosophy. *Prerequisite:* Skill competency in field hockey. Two hours.

**129 Coaching Volleyball** Theory and techniques of coaching volleyball. Includes skill and game analysis, practice, game and schedule organization. *Prerequisite:* Skill competency in volleyball, sophomore standing or permission of instructor. Two hours.

**130 Coaching Tennis** Analysis and practice of skills, techniques, and knowledge essential for teaching/coaching tennis. Methodology for individual and large group instruction. *Prerequisite:* Skill competency in tennis, sophomore standing or permission of instructor. Two hours.

**131 Coaching Lacrosse** Theory and techniques of coaching lacrosse. Includes skill and game analysis, practice, game and schedule organization. *Prerequisite:* Skill competency in lacrosse, sophomore standing or permission of instructor. Two hours.

**135 Adaptive Aquatics** Skills and techniques for teaching the handicapped to swim. Prepares instructors to deal with a full range of physical, mental, and emotional handicapping conditions in an aquatic setting. *Prerequisite:* 26 or permission of instructor. Two hours.

**140 Seminar in Physical Education** Strategy, analysis, techniques, and contemporary issues in selected areas of physical education. Variable credit based upon nature of semester topic selection, one to three hours.

**141 Alternative Careers in Physical Education and Sport** Analysis of nonteaching employment opportunities, career options related to sport within a broad range of school and nonschool settings. *Prerequisite:* Sophomore standing. Three hours.

**145 Seminar in Athletics** Contemporary issues, strategy, analysis, and problem areas related to selected comparative sports. Variable credit. One to four hours.

**155 Physical Education in the Secondary School** Theories of teaching which include unit plan development, classification and grouping of students for instruction, and a variety of teaching methods. Laboratory experience in teaching activity skills to youth aged 12-18. *Prerequisite:* Junior standing. Three credits.

**157 Care and Prevention of Athletic Injuries** Prevention, recognition, and care of injuries related to school physical education and athletic programs. Two hours.

**158 Organization and Administration of Physical Education** Organization and administration of instructional programs, intramurals, interscholastic athletics, school recreational programs, schedules, personnel, budgets, equipment, records, tests, and public relations. Three hours.

**166 Kinesiology** Designed for the teacher/coach to analyze factors of peak physical performance. Muscle actions, mechanical principles, related factors enhancing movement are emphasized. *Prerequisite:* One year of biological science. Three hours.

**167 Sports Physiology** Analysis of responses on circulatory, respiratory, and other body systems to vigorous activity. Comprehensive aspects of conditioning, fatigue, heat, altitude, nutrition, energy continuum, ergogenic aids, aging also examined. Three hours.

**168 Tests and Measurements in Physical Education and Health** Principles and techniques in evaluation of instruction. Emphasis given to test selection, administration, construction, application of statistical procedures, and development and interpretation of research data. *Prerequisites:* Six hours in EDPE or health education, junior standing. Three hours.

**172 Psychology of Coaching** Application of psychological subdisciplines to coaching. Learning, motivation, transfer, retention, emotion, and personality variables discussed with implications for the coach. *Prerequisites:* Psychology 1, junior standing. Three hours.

**173 Practicum in Field Experience** Individually prescribed teaching experience involving work with youth groups in activities related to physical education, health, or recreation. Responsibilities approximate those commonly associated with student teaching. *Prerequisite:* 104, 105, or 155 or permission of instructor. Variable credit, two to four hours.

**185 Advanced Athletic Training** Advanced concepts and skills in screening tests for injuries, rehabilitation, athletic fitness and conditioning programs, injury recognition and treatment, the use of drugs in athletics, and pathology. *Prerequisites:* 157, permission of instructor. Three hours.

**186 Advanced Athletic Training II** Emphasis upon use of modalities and techniques of rehabilitation in treatment of athletic injuries. *Prerequisites:* 157, 185. Three hours.

**192 Recreational Sports Programming I** Exploration and examination of the philosophy, science, and communications within a recreational sports setting. Three hours.

**193 Recreational Sports Programming II** Exploration, examination, and development of skills in programming techniques, governance procedures, and facility maintenance operations in recreational sports. *Prerequisite:* 192 or permission. Three hours.

**195 Recreation Leadership and Programming** Practical approach to significance, theories, and characteristics of leadership content, and methods of program planning. Field work practice in planning and leadership techniques. *Prerequisite:* 54. Three hours.

**201 Administration of Athletic Programs** Designed to provide athletic director, school administrator, and teacher-coach with background for effective administration of athletic program of schools. Scheduling, budgeting, management, equipment, policy, public relations, and educational justification. *Prerequisite:* Twelve hours in education and psychology. Three hours.

**203 Principles of Physical Education** Principles basic to sound philosophy of physical education for appraisal of historical development; relationship to health education, recreation and other areas; foundation and functions of physical education in contemporary society. *Prerequisites:* Admission to the program, junior standing. Three hours.

**230 Philosophy of Coaching** In-depth study of over 100 major philosophical coaching considerations. Lectures by visiting coaches. Study in areas of need and interest. Three hours.

**240 Principles of Motor Learning and Human Performance** Study of nature of motor learning; factors affecting motor learning, such as motivation, emotion, and stress; concepts of transfer and retention; alternatives in teaching and coaching methodologies based upon applied principles in motor learning. *Prerequisites:* 166, EDSS 145 or 146. Three hours.

**241 Seminar in Physical Education and Athletics** Examination and analysis of contemporary issues and trends in physical education and athletics not especially appropriate within boundaries of an existing course. *Prerequisite:* Twelve hours in physical education and related areas. Variable credit, two to four hours.

**253 Curriculum Design in Health and Physical Education** Philosophy and techniques of curriculum innovation in health and physical education. Emphasis upon inter-relationships between student needs and interests, teaching methodology, evaluative procedures, community involvement, and administrative organization patterns. *Prerequisites:* Junior standing, 104, 105, 46 or 155. Three hours.

**260 Adaptive Physical Education** Recognition, prevention, and correction of functional and structural deviations from normal body mechanics. Organization of programs adapted to needs of handicapped individuals in both special class and mainstreamed settings. *Prerequisites:* 155, 104, 105 or equivalent teaching experience. Three hours.

#### HEALTH EDUCATION — EDHE

**46 Personal Health** Concepts of personal health related to problems of daily living. Mental health, sex education, nutrition and weight control, fatigue and relaxation, chronic and communicable disease, stimulants and depressants. Three hours.

**150 Seminar in Health Education** Research, discussion, and critical examination of selected topics and special issues in health not currently covered in existing courses. *Prerequisite:* Six hours in health education or permission of instructor. Variable credit, one to four hours.

**173 Practicum in Field Experience** Individually prescribed teaching experience involving work with health agencies, both public and private. Responsibilities approximate those commonly associated with student teaching. *Prerequisite:* Permission. Variable credit, one to four hours.

**182 Health Methods and Materials** Fundamental methods of teaching health as applied to school and public health education. Consideration of materials applicable to health education, evaluation techniques, preparation of teaching units and bibliographies. *Prerequisite:* 46. Three hours.

**208 School Health Programs** Organization of total school health program. Problems and administration in area of school environment, health services, health education, and school-community relationship. *Prerequisite:* 46 or equivalent. Three hours.

**211 Community Health Education** Governmental and voluntary agencies' sociological, historical, educational, environmental, and medical influences. Role of community health educator in these influences and major American health concerns. *Prerequisite:* 46. Three hours. (Graduate credit pending.)

**220 Stress Management for Health Professionals** Physiological, psychological, and sociological aspects of stress. Theory, practices, teaching techniques, and application relevant to teaching students and/or clients. *Prerequisite:* 46. Three hours. (Graduate credit pending.)

#### LIBRARY SCIENCE — EDLI

**272 Public and School Library Services** *Prerequisite:* Twelve hours in education and related areas or permission of instructor. Three hours.

**273 Cataloging and Classification** *Prerequisite:* 272 or equivalent. Three hours.

**274 Reference Materials and Teaching the Use of Libraries** *Prerequisite:* 272 or equivalent. Three hours.

**275 Selection of Books and Materials for Young Adults** *Prerequisite:* 272 or equivalent. Three hours.

**276 Reference Sources and Services** *Prerequisite:* 274. Three hours.

**277 Library Materials and Services for Media Personnel** *Prerequisites:* 272, 273. Three hours.

**278 Cataloging and Organization of Media Materials** *Prerequisite:* 273. Three hours.

**279 Selection of Library Materials for Children** *Prerequisite:* 272 or equivalent. Three hours.

#### HUMAN SERVICES — EDHS

**209 Introduction to Research Methods in Education and Social Services** Seminars and research projects introduce students to methods of historical, descriptive, experimental, quasi-experimental, field studies, and survey research. Three hours.

**258 Community Organizations and Resources** Introduction to range of clients served by human service agencies and response patterns typically initiated. Survey of facilities and services available. *Prerequisite:* Permission of instructor. Three hours.

**291 Special Topics in Organizational and Human Resource Development** Designed to accommodate various special issues in counseling, administration and planning, social work, or higher education not appropriate to content of an existing course. Courses reflect the social services orientation of OCFS. Variable hours.

#### SPECIAL EDUCATION — EDSP

**5 Mental Retardation and Related Disabilities** Open to all University students who wish an introduction to mental retardation and related disabilities — cerebral palsy, epilepsy, autism, and others. Includes field trips which may involve lab fee. Three hours.

**201 Foundations of Special Education** Examination of historical and current trends in treatment of handicapped individuals, including effects of litigation, legislation, and economic considerations on educational and residential service delivery systems. *Prerequisite:* Twelve hours in education and related areas or permission of instructor. Three hours.

**207 Cooperative Learning** Theoretical and experiential instruction in procedures to increase social acceptance and academic achievement of exceptional learners in mainstream settings through cooperative learning. *Prerequisite:* Permission of instructor. Three hours.

**216 Instruction for Mildly Handicapped Individuals** Introduction to curriculum for instruction of children with learning disabilities, mental retardation, and behavior disorders emphasizing objectives, assessment, task analysis, curriculum, and evaluation. *Prerequisite:* Permission of instructor. Three hours.

**217 Instruction for Severely Handicapped Individuals** Individualized instruction for severely handicapped learners emphasizing objectives, assessment, task analysis, curriculum, and evaluation. *Prerequisite:* Permission of instructor. Three hours.

**224 Instruction for Mildly Handicapped Individuals** Students apply principles of behavior analysis to improve academic and social skills of individuals with learning disabilities, mental retardation, and behavior disorders. *Prerequisite:* Permission of instructor. Three hours.

**228 Instruction for Severely Handicapped Individuals** Students apply principles of behavior analysis to improve skills in learners severely handicapped in motor, social, communication, or self-care areas. *Prerequisite:* Permission of instructor. Three hours.

**275 Developing Vocational Instruction for Students With Special Needs** (See Vocational Education and Technology 275.)

**290 Curriculum for Handicapped Individuals** Intensive study of aspect of curriculum that constitutes basic skills and knowledge learned at a given instructional level. Curriculum specified in terms of instructional objectives. Evaluation system developed to measure each learner's achievement. *Prerequisite:* Permission of instructor. Credit as arranged.

**296 Special Education Practica For Classroom Teachers** Credit as arranged.

**297 Curriculum for Handicapped Individuals** Students develop and implement an objectives-based curriculum for learners with learning disabilities, mental retardation, behavior disorders, and/or multihandicaps. *Prerequisite:* Permission of instructor. Credit as arranged.

**298 Special Education Practicum** Students provide direct instruction for six learners with learning disabilities, mental retardation, behavior disorders, and/or multihandicaps. *Prerequisite:* Permission of instructor. Credit as arranged.

#### ADMINISTRATION AND PLANNING — EDAP

**264 Evaluation in Education and Social Services** To acquaint educational and social service personnel with overview of state-of-the-art evaluation, emerging concepts, related models, and potential applications to settings requiring data to be systematically analyzed. *Prerequisite:* Twelve hours in education or permission of instructor. Three hours.

**266 Educational Finance** Consideration of national and state statutes and practices in educational finance and taxation; local practices in taxation; other revenue sources; methods for school budgeting; financial expenditure procedures. *Prerequisite:* Twelve hours in education or permission of instructor. Two to three hours.

**268 Educational Law** Survey of the legal basis for education. Investigations of state and federal statutes; related court cases; Attorney General opinions; special education procedures; Vermont State Board and State Education Department policies and regulations. *Prerequisite:* Twelve hours in education or permission of instructor. Two to three hours.

**291 Special Topics in Organizational and Human Resource Development** To accommodate various special issues in counseling, administration and planning, social work, or higher education not appropriate to content of an existing course. Courses reflect social services orientation of OCFS. Variable hours.

#### HIGHER EDUCATION — EDHI

**202 Human Relations in University Residence Halls** Emphasis on human relations, group dynamics, advising models, student development theory, organizational development, and contemporary student issues in a residential environment. *Prerequisite:* Residence Hall staff. One hour. (Not offered for graduate credit.)

**213 Leadership: Theories, Styles, and Realities** Introductory course in leadership development designed for student leaders. Includes study of planning, time management, organizational theory, communication skills, group process, team building. Two hours. (Not offered for graduate credit.)

**214 Advanced Seminar in Leadership** Advanced courses in leadership development for experienced student leaders. Emphasizes moral and ethical responsibilities of leaders and organizational theory. *Prerequisite:* 213. Two hours. (Not offered for graduate credit.)

**232 Adult Development and Education** Critical examination of research on adult education, adult learning, development theory, reentry issues facing older students. Analysis and preparation of proposals for new adult-oriented educational programs. *Prerequisite:* Twelve hours in education or permission of instructor. Three hours.

**291 Special Topics in Organizational and Human Resource Development** To accommodate various special issues in counseling, administration and planning, social work, or higher education not appropriate to content of an existing course. Courses reflect social services orientation of OCFS. Variable hours.

#### COUNSELING — EDCO

**220 Developmental Perspectives in Counseling**

Approaches to understanding human behavior in applied settings. Emphasis on behavior development as an interpersonal process. *Prerequisite:* Twelve hours in education and psychology. Three hours.

**274 Counseling Theory and Practice** A theoretical and practical approach to understanding dynamics of counseling process. Emphasis upon refinement of a personal philosophy and theory of counseling and implementation of it in practice. *Prerequisites:* Twelve hours in education and/or psychology, permission of instructor. Three hours.

**285 Sexuality Counseling and Therapy** Facilitation of the transfer of general counseling and psychotherapy skills to work with sexual issues. Study and practice over both remediation and prevention. *Prerequisites:* Eighteen graduate hours in counseling or psychology, or permission of instructor. Three hours.

**291 Special Topics in Counseling** Special issues in counseling, administration and planning, social work, or higher education not appropriate to content of an existing course. Courses reflect social services orientation of OCFS. Variable hours.

**293 Group Dynamics: Theory and Experience** Encounter group experience for prospective counselors geared to provide increased awareness of self and of modes of relating to others. Study of theory and practice of group dynamics. *Prerequisites:* Twelve hours in education and psychology, permission of instructor. Three credits.

#### PHYSICAL EDUCATION — PEAC

*Physical Education Activities. Two or three hours weekly. One-half or one credit.*

*Two hours of physical education activities are required of undergraduate students (see page 35). The program is centered around the physical needs, abilities, and interests of young adults. The aims are to help all to improve and maintain physical fitness; to provide opportunity to establish skills in a variety of movement activities; to bring performance in elected physical activities to a high level of satisfying proficiency; to find enjoyment in physical activity and lasting interest in continuing voluntary participation. Classes are coeducational unless indicated for men or women only.*

Advanced Life Saving	Running for Fitness
Aerobics	SCUBA Diving
Archery	Ski Instructors
Badminton	Soccer
Body Building	Social Dance
Conditioning	Squash
Cross Country Skiing	Stretch and Relaxation
Fencing	Swimming
Fitness Assessment	Tap Dance
Folk and Square Dance	Tennis
Golf	Track and Field
Gymnastics	Volleyball
Handball	Weight Reduction
Modern Dance	Weight Training
Racquetball	Yoga

*The following activities require special fees for transportation and/or instruction. The student must also provide special attire and/or equipment in skiing, ice skating, and karate:*

Ballet	Ice Skating
Bowling	Judo
Downhill Skiing	Karate, Korean
Figure Skating	Modern Jazz
Horseback Riding	

*The following activities, co-offered by the Physical Education*

and ROTC Departments, may be counted toward the physical education requirements:

- Orienteering
- Rappelling
- Wilderness Survival

Activities are offered at various levels of instruction and numbered as follows:

- Level 1. Beginner, very first experience with an activity.
- Level 2. Beginning mastery of basic skills and knowledges, equivalent to seven weeks of previous instruction.
- Level 3. Intermediate; equivalent of 14 weeks of instruction.
- Level 4. Intermediate-Advanced; introduction to more complex skills and strategy.
- Level 5. Advanced.

### OTHER COURSES IN EDUCATION

In addition to the courses previously described, the following courses are also offered, usually in the Summer Session and Evening Division.

- 172 The Creative Process Through Art** Three hours.
- 209 Education of Teachers of the Mentally Retarded I — Early Years** Three to six hours.
- 210 Education of Teachers of the Mentally Retarded II — Later Years** Three to six hours.
- 214 The Slow Learner (Education of the Exceptional Child)** Three to six hours.
- 215 The Gifted Child** Three hours.
- 219 Workshop in Economic Education** One to four hours.
- 229 Communicative Arts in Secondary Schools (Teaching English in Secondary Schools)** Three hours.
- 257 Teaching Mathematics in Secondary Schools** Three hours.
- 259 Teaching Foreign Language in the Elementary (Secondary) School** Three hours.
- 261 Seminar in Business Education** Three hours.
- 282 Seminar for Prospective Teachers of English** Three hours.
- 291 Psychology of Music** Three hours.
- 294 Seminar for Prospective Teachers of Communication** Three hours.

## Electrical Engineering (EE)

### COLLEGE OF ENGINEERING AND MATHEMATICS

Professors Absher, Anderson, Evering, Golden (Chairperson), Mirchandani, Rush, Williams; Associate Professor Oughstun; Assistant Professors Fuhr, Schwartz, Titcomb; Adjunct Professor Pricer.

### UNDERGRADUATE COURSES

- 3 Engineering Analysis I (3-0)** Circuit elements, laws, and basic techniques of circuit analysis. Network principles and theorems. Energy-storage elements. Transient analysis and time-constants. Sinusoids and phasors. Sinusoidal steady-state response and steady-state power. *Prerequisite:* Math. 21. Three hours.
- 4 Engineering Analysis II (3-0)** Complex frequency and network functions. Resonance. Magnetically coupled circuits. Two-port networks. Application of Fourier series and Fourier transforms in circuit and systems analysis. Laplace transform techniques. *Prerequisite:* 3. Three hours.

**94 Bioengineering Applications of Physical Principles II (3-3)** Application of principles of electromagnetism and electrical engineering to an understanding of the structure and function of the human body and to diagnostic and therapeutic instrumentation. Four hours.

**100 Electrical Engineering Concepts I (3-3)** Introduction to analog and digital electrical measurements and circuits; introduction to microprocessors. Restricted to non-majors. *Prerequisite:* Physics 42 with 22 or 125. Four hours.

**101 Electrical Engineering Concepts II (3-3)** Microprocessor applications; power systems. Restricted to non-majors. *Prerequisite:* 100. Four hours.

**110 Control Systems (3-0)** Analysis and design of continuous and discrete-time control systems; stability, signal flow, performance criteria, classical and state variable methods, simulation design tools, computer-based realizations. *Prerequisite:* 172. Three hours.

**113 Electromechanical Energy Generation and Distribution (3-0)** Principles basic to electromechanical energy conversion devices and systems. Energy interchange among magnetic and mechanical circuit elements. Continuous energy conversion in ideal and practical rotating machines. *Prerequisite:* 141. Three hours.

**114 Electric Energy Conversion Systems (3-0)** Systems for energy conversion to electricity, primarily. Emphasis on systems (e.g. fossil fuel, hydro, fission, solar, wind, etc.), their technical operation characteristics, economics, and environmental impact. Designed for engineers and scientists. *Prerequisite:* Physics 125. Three hours.

**120 Electronics I (3-0)** Properties of semiconductors. PN junctions. Application of diodes. Circuit models for transistors, and other active devices. Biasing techniques and regions of operation. *Prerequisite:* 4. Three hours.

**121 Electronics II (3-0)** Properties of amplifiers. Amplifier design. Feedback in electronic circuits. High-frequency circuit models and limitations. Operational amplifiers. *Prerequisite:* 120. Three hours.

**122 Electronics III (3-0)** Analysis of pulse and digital circuits. Design of transistor logic gates, multivibrators, and blocking oscillators. *Prerequisite:* 121. Three hours.

**131,132 Fundamentals of Digital Computer Design (3-0) (3-0)** Fundamentals of design of combinational and sequential logic circuits. Logic circuits implemented with MSI and LSI. Register transfer logic. Memory systems. Instruction codes. Processor and control logic design. Introduction to system design for computers and microcomputers. *Prerequisites:* Computer Science 11 or equivalent, 131 for 132. Three hours.

**134 Fundamentals of Microcomputer Based Systems (3-2)** Introduction to digital computers. Hardware and software structure. Techniques of interfacing. *Prerequisite:* 100, Computer Science 11, or permission of instructor. Four hours.

**140, 141 Electromagnetic Field Theory (3-0) (3-0)** Basic laws and elementary applications of electromagnetic fields; electrostatics, magnetostatics, Faraday's law, Maxwell's equations, plane waves, transmission lines, waveguides, and antennas. *Prerequisites:* 4 or Physics 125 for 140; 140 or Physics 213 for 141. Three hours.

**146 Wave and Diffusion Analogies (3-0)** Electromagnetic waves on lines and in space. Vibration of strings and membranes. Mechanical waves in fluids and solids. Electro-mechanical transducers. Thermal waves. Diffusion process. *Prerequisite:* 141. Three hours.

**163 Solid State Physical Electronics I (3-0)** Physical principles of operation of common semiconductor devices. Detailed models of p-n junctions, bipolar junction transistors, Schottky barriers, and field-effect transistors. *Prerequisite:* Physics 42 with 22 or 128. Three hours.

**164 Solid State Physical Electronics II (3-0)** Phys-

ical principles of electronic materials. Atomic and electronic structure of solids, energy band theory, carrier transport. Semiconductor, dielectric, magnetic, and superconducting materials. *Prerequisites:* 163, Physics 128. Three hours.

**171, 172 Signals and Systems (4-0) (4-0)** Continuous and discrete-time signals and systems. Convolution, Fourier, Laplace, and z-transforms and transfer functions. Elements of analog and digital filters, modulation, control, and application. *Prerequisites:* 4, 171 for 172, Math. 121. Four hours.

**174 Introduction to Communication Systems (3-0)** General background. Coding and error correcting codes. Noise and topics in statistical communications. Data, computer, and secure communications. *Prerequisite:* 172. Three hours.

**195 Special Topics.** *Prerequisite:* Departmental permission. Variable credit.

### LABORATORIES

**81 Sophomore Laboratory I (1-3)** Electrical instruments; oscilloscope measurements; resistive, capacitive, and inductive components; nonlinear resistive elements; binary concepts and digital logic; transient response of RC circuits; three terminal networks. *Prerequisite:* Sophomore standing in EE. Two hours.

**82 Sophomore Laboratory II (1-3)** Transients in RLC circuits; steady state response in RLC circuits; network theorems, bridge measurement circuits; mutual inductance; spectrum analysis; diode circuits; DC power supply design. *Prerequisite:* 81. Two hours.

**183 Junior Laboratory I (1-3)** Characteristics of active devices; BJT and JFET amplifiers; MOSFET, UJT, and SCR applications; applications of operational amplifiers; semiconductor diode characteristics. *Prerequisite:* Junior standing in EE. Two hours.

**184 Junior Laboratory II (1-3)** Dielectric materials; current flow in volume conductors; photovoltaic cells; passive, active, and digital filters. *Prerequisite:* 183. Two hours.

**185 Senior Laboratory I (0-3)** AC and DC machines; power transformers; A/D and D/A conversion; design and construction of multivibrator and Schmitt trigger circuits; design project. *Prerequisite:* Senior standing in EE. One hour.

**186 Senior Laboratory II (0-3)** Open and closed loop control systems; electromagnetic waves on transmission lines; time domain reflectometry; microwaves; special topics; design project. *Prerequisite:* 185. One hour.

**187 Senior Project** Experimental or theoretical design project conducted under faculty supervision. Variable credit, usually three hours.

### 193, 194 College Honors

### ADVANCED UNDERGRADUATE AND GRADUATE COURSES

**201 Linear System Theory (3-0)** Analysis of systems and application to problems in electrical engineering. Modeling and analysis of both discrete and continuous-time linear systems. Continuous and discrete time Fourier transforms. Approximation and model reduction using state-space methods. *Prerequisite:* Graduate standing in EE or permission of instructor. Three hours.

**202 Network Analysis (3-0)** Characterization of and computational methods for analysis of linear and nonlinear circuits emphasizing large-scale circuits. State variable, modified nodal and sparse tableau formulations. Detailed transistor modeling for D.C., transient, and steady-state analysis. Methods for determining sensitivity. *Prerequisites:* 171, Math. 124 or equivalent background. Three hours.

**209 Transient Phenomena (3-0)** Study of complex variable basis of Laplace and Fourier Transforms; applications to transient behavior of lumped and distributed parameter sys-

tems, root locus. Nyquist criterion and two-dimensional field problems. *Prerequisite:* 4. Three hours.

**220 Electronic Instrumentation for Scientists (3-3)** Introduction to electrical components and circuit theory, electrical measurements, oscilloscopes, power supplies, amplification, oscillators, measurements, servos, operational amplifiers, electronic switching, timing and digital counting circuits. Not for credit for students in EE. *Prerequisites:* College physics, calculus or permission of instructor. Four hours.

**221 Principles of VLSI Digital Circuit Design (2-3)** The design, layout, and simulation of VLSI digital circuits. Emphasis on custom, laboratory design; typical topics will include memory, PLA, ALU, and elemental arithmetic circuits. *Prerequisites:* 131, 163, 121. Three hours.

**231, 232 Digital Computer Design (3-0) (3-0)** Hardware components design, organization, realization. Design concepts and procedures illustrated through design of small instructional computer. Microprogrammed control units, memory organization, hardware realization of high-speed arithmetic operations. Interrupt and I/O systems, interfacing and inter-system communications. *Prerequisite:* Departmental permission. Three hours.

**233, 234 Microprocessor-Based Systems and Applications (3-3) (3-3)** Basic principles of mini/microcomputers; A/D; D/A; channels, magnetic devices, display devices, mechanical devices; interface designs of analog systems to mini/microcomputers; principles of microprogramming; bit-slice-based microcomputers. *Prerequisite:* Departmental permission, Computer Science 101 desirable, 233 for 234. Four hours.

**240 Boundary Value Problems in Electromagnetism (3-0)** Solution of classical problems of electromagnetism using images, conformal mapping, and separation of variables methods. *Prerequisite:* 141. Three hours.

**242 Theory and Applications of Time-Varying Fields (3-0)** Maxwell's Equations and boundary conditions for time varying systems. Propagation and reflection of electromagnetic waves, guided electromagnetic waves, resonant cavities, and microwave networks. *Prerequisite:* 240 or departmental permission. Three hours.

**245 Electro-Optical Devices (3-0)** A theoretical description of light-matter interactions in photon emitting resonant cavities and a practical understanding of laser design and operation. *Prerequisites:* 141, Physics 128, permission of instructor. Three hours.

**261 Semiconductor Materials and Devices I (3-0)** Introduction to energy band theory and the effective mass concept. Effect of band structure on electronic properties of semiconductors. Transport of electrons and holes in bulk materials and across potential barriers. Homojunctions, heterojunctions, and Schottky barriers. *Prerequisites:* Physics 128, Math. 121. Three hours.

**262 Semiconductor Materials and Devices II (3-0)** Operating principles of bipolar junction transistors and field effect transistors. Derivation of equivalent circuits. Applications to integrated circuits, charge-transfer devices, integrated logic. *Prerequisite:* 261. Three hours.

**266 Science and Technology of Integrated Circuits (3-0)** Science and technology of silicon monolithic integrated circuit processing and the interactions of the processing steps with the electrical circuit properties are investigated. *Prerequisites:* 163 or 261, concurrent registration in 164 or 262. Three hours.

**270 Signal Analysis (3-0)** General signal concepts. Random signals. Correlation techniques. Noise in linear systems. Wiener and Kalman filters for data smoothing and prediction. Spectral estimation. *Prerequisite:* 171 or equivalent. Three hours.

**271 Signal Processing: Detection and Estimation**



**(3-0) Principles of detection and estimation.** Detection of signals in noise. Estimation of signal waveforms and signal spectra. Wiener and Kalman filters. Applications to communication and radar systems, pattern recognition, and biomedical signal analysis. *Prerequisites:* 270. Three hours.

**272 Information Theory (3-0)** Introduction to probability concepts of information theory; entropy of probability models; theoretical derivations of channel capacity; coding methods and theorems, sampling theorems. *Prerequisite:* Statistics 151. Three hours.

**275 Digital Signal Processing and Filtering (3-3)** Sampling, aliasing, and windowing. FIR and IIR filters. DFT and FFT. Linear predictive coding. Vocoders. Digital simulation and implementation using real-time processors and evaluation modules. *Prerequisites:* 171, permission of instructor. Four hours.

**276 Image Processing and Filtering (3-3)** Image sampling, quantization, and reconstruction. Discrete two-dimensional transforms and linear processing techniques. Image enhancement and restoration methods. Lab includes real-time and interactive image processing. *Prerequisite:* 275. Four hours.

**277 Image Analysis and Pattern Recognition (3-0).** Image, shape, and texture analysis. Statistical pattern recognition methods. Pattern recognition and computer vision techniques for machine parts recognition and automatic visual inspection. *Prerequisite:* 276. Three hours.

**281 through 284 Seminars (1-0)** Presentation and discussion of advanced electrical engineering problems and current developments. *Prerequisite:* Senior or graduate engineering enrollment. One hour.

**285 Creative Engineering (3-0)** Creative techniques applied to problems in process control, biomedical engineering, communications, circuit design. *Prerequisite:* Graduate standing in EE or departmental permission. Three hours.

**295 Special Topics (3-0)** Formulation and solution of theoretical and practical problems dealing with electrical circuits, apparatus, machines, or systems. *Prerequisite:* 4. Three hours.

## English (ENGL)

### COLLEGE OF ARTS AND SCIENCES

*Professors Bradley, Broughton, Clark (Chairperson), Cochran, Eschholz, Fulwiler, Howe, Huddle, Manchel, Orth, Poger, Rosa, Rothwell, Shepherd, Thompson; Associate Professors A. I. Dickerson, Edwards, Gutman, Hall, Simone, Stanton, Stephany; Assistant Professors Biddle, Holstun, Magistrate, Sweterlitsch, Warhol; Lecturers M. J. Dickerson, Moore.*

*Unless otherwise indicated, all courses in the Department of English carry three hours of credit.*

**1 Written Expression** A course in writing with some selected readings as examples of style and writing strategies.

**4 English for International Students** Review of English grammar, practice in expository writing, vocabulary building, and improvement of speaking and listening skills. *Prerequisite:* Instructor permission. Fall only. Martenis.

*Courses numbered 11-26 are introductory literature courses. They are appropriate preparation for reading and writing about literature. Prospective English majors, see also English 81, 82.*

**11 Types of Literature** Introduction to fiction, poetry, and drama — past and present, British and American.

**12 Genre: Drama** Approach to the play as a work of literature and as a dramatic experience. Continental, British, and American drama, drawn from all ages.

**13 Genre: Fiction** Exploration of variety of fictional forms, including the short story, the novella, and the novel.

**14 Genre: Poetry** Examination of the forms of poetry, past and present, British and American. Provides a wide variety of perspectives on the poem.

**17, 18 Freshman Seminar** An accelerated course in which students' reading, writing, and research will be more demanding than in typical introductory-level courses. Topics vary by semester with instructor. *Prerequisite:* Departmental approval and permission of instructor.

**21, 22 British Literature** Survey of major figures in British literature such as Chaucer, Milton, Swift, Wordsworth, and Shaw.

**23, 24 American Literature** Survey of major American writers from the beginning of the 19th century to the present, such as Hawthorne, Melville, Twain, Hemingway, and Faulkner.

**25, 26 World Literature** Survey in comparative literature dealing with the great writers of the world, to include Virgil, Dante, Goethe, and similar major figures.

**27, 28 Literature of Western Tradition: Integrated Humanities** Study of primary authors in the Western cultural tradition from Homer to the modern period with particular reference to history, religion, and philosophy. *Prerequisites:* Concurrent enrollment in Religion 27, 28 and History 27, 28. Concurrent enrollment in Integrated Humanities Program. Three hours. Simone.

**30 Introduction to the English Language** Topics include consideration of language as a part of human behavior, history of the language, dialects of American English, lexicography, and the new analyses of English. Sweterlitsch.

*Courses numbered in the 40's and 60's are open to freshmen but will not count as prerequisites for 100-level English courses.*

**40 Science Fiction and Fantasy Literature** Representative modern works of fantasy and science fiction, including works by Asimov, Tolkien, and Clarke. I, II. Stanton.

**41 Detective Fiction** A study of the historical development of American and British detective fiction from Poe to the present. Three hours. Poger.

**42 Women in Literature** Consideration of the changing roles of women through examination of the images, archetypes, and stereotypes of women characters in selected literary works. Clark, Thompson.

**50 Expository Writing** Writing and analysis of expository (nonfiction) essays. *Prerequisite:* Sophomore standing. Biddle, Edwards, Eschholz, Howe, Moore, Rosa, Rothwell, Sweterlitsch, Warhol.

**53 Writing: Poetry and Fiction** Introductory course in techniques of writing poetry and short prose fiction. Classes organized around discussion of student work; weekly writing assignments. *Prerequisite:* Sophomore standing. Broughton, M. J. Dickerson, Edwards, Huddle.

**62 Bible as Literature** Jewish and Christian scripture analyzed as literary documents. Stephany.

**65 Survey of Folklore** Basic concepts of folklore; development of the discipline; defining the major genres; role of folklore in modern society. Sweterlitsch.

**81, 82 Survey of British and American Literature** Study of literary movements, themes, and backgrounds as illustrated in selected representative texts. No prerequisite, but recommended only for students with sophomore standing, or freshmen with Advanced Placement. Required of all English majors.

**95, 96 Introductory Special Topics** Introductory

courses or seminars on topics beyond the scope of existing departmental offerings. See Schedule of Courses for specific titles.

*The prerequisites for courses numbered 100-199 are three hours in English courses numbered 11-26, or 81, or 82, and sophomore standing.*

*Unless otherwise indicated, 100-level courses will be offered every year. Occasionally a 200-level seminar will replace a specialized 100-level course.*

**101 Structure of the English Language** Descriptive study of modern American English. I, II. Clark.

**102 History of the English Language** Principles of historical linguistics and their application to English. Clark. Alternate years, 1989-90.

**108 Dante's Comedy** (Same as General Literature 173.) A study of Dante's *Comedy* in Modern English translation. Stephany. Alternate years, 1989-90.

**110 Old English** The sounds, words, and structure of Old English; simple prose texts and selections from *Beowulf*. A. I. Dickerson. Alternate years, 1989-90.

**111 Chaucer** Study of the principal works of Chaucer, emphasizing Chaucer's literary scope, talents, and position in medieval literature. A. I. Dickerson, Stephany.

**112 Medieval Literature** Major works of medieval literature in translation, with some principal non-Chaucerian works in Middle English. Works by Dante and works in the Arthurian tradition will be included. A. I. Dickerson. Alternate years, 1988-89.

**115, 116 Shakespeare** Howe, Rothwell, Simone.

**118 Milton** *Paradise Lost*, *Paradise Regained*, *Samson Agonistes*, some minor poems, and selected prose works. Holstun.

**119 16th Century English Literature** A survey of 16th century lyric, dramatic, and narrative genres, emphasizing the rise of a national literary culture. Holstun. Alternate years, 1988-89.

**120 English Literature: 1603-1660** A survey of lyric, dramatic, and narrative genres of early Stuart and Commonwealth England, emphasizing the intersection of religion, literature, and politics. Holstun. Alternate years, 1989-90.

**121 Restoration and 18th Century Prose, Poetry, and Drama** Significant writers and dramatists from Dryden to Sheridan and Johnson. Stanton. Alternate years, 1989-90.

**123 18th Century English Novel** English fiction from its origin through the 18th century. Hall, Stanton, Warhol.

**124 19th Century English Novel** English fiction of the 19th century. Hall, Stanton, Warhol.

**125 Romantic Period I** Development of the Romantic Movement through Wordsworth and Coleridge. Jones, Stanton.

**126 Romantic Period II** Development of the Romantic Movement through Byron, Shelley, Keats, and other Romantic poets and prose writers. Jones, Stanton.

**127 Victorian Literature** Significant writers, exclusive of novelists, from 1832 to 1900. Stanton. Alternate years, 1989-90.

**128 Folktale and Ballad** Traditional folktales and ballads viewed from literary, cultural, structural, and psychological perspectives. Relationship of both forms to 19th and 20th century literature explored in detail. Sweterlitsch.

**131 Modern British Drama** British and continental plays of the 19th and 20th centuries, including plays by Ibsen, Pinter, and Beckett. Simone.

**132 Modern British Novel** Bradley.

**134 Modern Irish Literature** Irish literature from 1890 to the present, emphasizing Joyce and Yeats. Bradley.

**135 Canadian Literature** The development of a na-

tional literature. Required of students in the Canadian Area Studies Program. Thompson.

**136 Contemporary Canadian Literature.** Thompson.

**140 Modern Poetry** Survey of poetry from beginning of modern period to end of World War II, emphasizing poetry of Yeats, Eliot, Stevens, Auden, Frost, Williams, and others. Edwards, Gutman, Poger.

**141 19th Century American Novel** The flowering of the novel in the U.S. Hawthorne, Melville, Twain, Howells, James, and others. Biddle, Cochran, Shepherd.

**144 American Poetry to World War I** Major American poets to 1917, including Poe, Whitman, Dickinson, and others. Gutman.

**145 The Literature of Vermont** An exploration of Vermont writing from the narratives of the Allen brothers to the poetry and fiction of today. Normally offered in summers only. Biddle, Eschholz.

**150 Modern Short Fiction. I, II.** Cochran, M. J. Dickerson, Huddle, Magistrale, Shepherd.

**151 Modern American Novel** American novelists from 1915 to 1945. Cochran, Shepherd.

**152 Modern American Drama** Recent and contemporary, including plays by O'Neill, Miller, and Williams. Orth.

**153 Contemporary American Poetry** American Poetry since 1950. Edwards, Gutman.

**154 Contemporary American Novel** Significant American novelists since 1945. Cochran, Shepherd.

**155 Literature of Black America** Poetry, fiction, and drama by black writers since the turn of the century. M. J. Dickerson, Magistrale. Alternate years, 1989-90.

**171 Writing Literary Criticism** Introduction to theory and practice of literary criticism. Students read and write about literary theories representing various approaches to selected works of literature. Holstun, Warhol.

**172 Personal Voice** Intensive examination of writing from the first-person point of view. Theory and practice in personal writing and analysis of published writing in this mode. *Prerequisite:* 50 or 53. Fulwiler.

**173 The Composing Process** Exploration of the process by which writers produce texts. Students study their own writing, the writing and reflections of established authors, and current research. *Prerequisite:* 50 or 53. Eschholz.

**177, 178 Advanced Writing** Students follow their own interests in the writing of poetry, fiction, and nonfiction. Permission of instructor required. *Prerequisite:* 53 for poetry and fiction, 50 for nonfiction. No more than six credit hours of English 177, 178 Advanced Writing or 179 Writer's Workshop, will count toward fulfillment of major requirements. Broughton, M.J. Dickerson, Fulwiler, Huddle.

**179 Writers' Workshop** An intensive two-week workshop with assignments designed to emphasize autobiographical aspects of poetry and fiction writing. Summer only. *Prerequisite:* 53, permission of instructor. Broughton, Engels, Huddle.

**191, 192 Internship** May not be used to satisfy major requirements. *Prerequisites:* Consent of instructor, junior or senior standing. One to six hours.

**193, 194 College Honors** Departmental permission required. Not to exceed three hours per semester.

**195, 196 Intermediate Special Topics** Intermediate courses or seminars on topics beyond the scope of existing departmental offerings. See Schedule of Courses for specific titles.

**197, 198 Reading and Research** Departmental permission required. Not to exceed three hours per semester.

*The prerequisite for courses numbered 200-262 is 81, 82, and six hours at the intermediate level (100-199). Seminar instruc-*

tors may specify particular intermediate courses as prerequisite to their seminars.

**201, 202 Seminar in Language, Criticism, and Rhetoric**

**211, 212 Seminar in British Literature to 1660**

**221, 222 Seminar in British Literature, 1660-1900**

**231, 232 Seminar in Modern British Literature**

**241, 242 Seminar in American Literature to 1900**

**251, 252 Seminar in Modern American Literature**

**261, 262 Seminar in Literary Themes, Genres, and Folklore**

**282 Seminar for Prospective Teachers of English** Grammar and language; literary interpretation and criticism; allied problems useful to teachers of English. This course does not satisfy the requirement for English majors of one 200-level seminar. *Prerequisites:* 50, 81, 82, 101, and one additional English course at the intermediate level. Biddle, Eschholz.

**295, 296 Advanced Special Topics** Advanced courses or seminars on topics beyond the scope of existing departmental offerings. See Schedule of Courses for specific titles. *Prerequisites:* Graduate or advanced undergraduate standing; permission of instructor.

### FILM (FILM)

*Film courses may not be used to satisfy requirements for the major in English.*

**5 Development of the Motion Picture I** An overview of the technological, artistic, economic, and sociological history of the cinema from its inception through the 1920's.

**6 Development of the Motion Picture II** An overview of the cinema's technological, artistic, economic, and sociological history from 1929-1960.

**107 Film Criticism** Intensive analysis of films to develop appropriate critical methods and standards. Possible approaches are sociological, psychological, aesthetic, and journalistic. Organized either historically or topically. *Prerequisite:* 5 or 6.

**161 Contemporary Cinema** A survey of the artistic trends, important personalities, economic and social factors that have shaped the past 25 years of narrative feature film history. *Prerequisite:* 5 or 6.

**162 American Film Genres** An investigation of the circumstances surrounding the production of American film genres, especially between the years 1930-1960. *Prerequisite:* 5 or 6.

**195, 196 Intermediate Special Topics** Intermediate courses or seminars on topics beyond the scope of existing departmental offerings. See Schedule of Courses for specific titles.

**271, 272 Seminar in Film** Selected topics in film. May be repeated with departmental permission. *Prerequisite:* Six hours of film courses, including 107.

## Environmental Studies (ENVS)

COLLEGE OF AGRICULTURE AND LIFE SCIENCES  
COLLEGE OF EDUCATION AND SOCIAL SERVICES  
SCHOOL OF NATURAL RESOURCES

*Professors Reidel (Director), Worley (Assistant Director); Associate Professors Flack (Assistant Director), Hudspeth; Assistant Professor King; Lecturers McKnight, Mixer, Paradise, Parsons; Adjunct Associate Professors Eddy, Hollister.*

**1 Introduction to Environmental Studies** Survey of environmental studies examining ecological, socioeconomic, aesthetic, and technological influences determining quality of

life on earth. *Prerequisite:* Freshman or sophomore standing or permission of instructor. Four hours. Flack, Reidel.

**2 International Environmental Studies** A multidisciplinary analysis of the interaction of global and local variables in understanding and solving pervasive environmental problems. *Prerequisite:* Freshman or sophomore standing. Four hours. King.

### 95, 96 Introductory Special Topics

**100 Environmental Theory** Comparative analysis of emerging concepts of human/environment relationships; the history, philosophy, and theoretical framework of environmental studies. *Prerequisites:* 1, 2. Three hours. Worley.

**151 Intermediate Environmental Studies** Analysis of environmental problems and issues from the perspective of various academic disciplines and professional fields, emphasizing interdisciplinary scholarship and research. *Prerequisites:* Major in Environmental Studies; 1, 2. Three hours. Reidel, Worley.

**178 Environmental Ethics** Critical examination of contemporary environmental moral problems; metaethical and normative analyses of issues including animal rights, earth duties, war, deep ecology, ecosophy, and alternative ethics. *Prerequisites:* One course in environmental studies, junior standing. Three hours. Worley.

**191 Environmental Practicum** Individual readings and research, internship, or field-based learning experience under direction of a faculty member or environmental practitioner. Credit arranged. *Prerequisite:* Permission of course coordinator. Reidel.

**195, 196 Special Topics** Special topics courses taught by Program faculty and community environmental practitioners which vary from semester to semester. Topics in the past have included environmental health, energy, regional planning, international studies, perspectives on war and peace.

**201 Research Methods** Planning, design, and methods of research for the study of environmental problems. *Prerequisite:* 151, junior standing, major in Environmental Studies. Three hours. Flack. (Not offered for graduate credit.)

**202 Senior Project and Thesis** Individual research under staff direction. *Prerequisites:* 201, permission of Environmental Program, major in Environmental Studies. Credit arranged. King. (Not offered for graduate credit.)

### 203 Senior Project and Thesis (Honors)

**204 Seminar in Environmental Studies** Review and discussion of current environmental research and literature. *Prerequisites:* 100, senior standing, major, coordinate major, or minor in Environmental Studies. Three hours. Hudspeth. (Not offered for graduate credit.)

**289 Environmental Economics** Application of economic theory and methods to environmental problems and policies. Includes cost-benefit analysis and economic incentives as tools for environmental problem solving. *Prerequisites:* 1, three hours intermediate economics. For students in Arts and Sciences: Economics 11-12, intermediate course in ENV. Three hours. King. (Not offered for graduate credit.)

### 291 Special Topics

**293 Environmental Law** Principles of environmental law, including legal research methods, threshold issues, case law, trial procedure, and international comparisons in aspects of air, land, and water law. *Prerequisite:* Junior standing. Three hours. Flack.

**294 Environmental Education** Philosophy, concepts, and strategies of environmental education, emphasizing integration of environmental concerns into formal and nonformal educational programs for youth and adults. *Prerequisite:* Six hours of intermediate or advanced courses in environmental studies, natural resources, or related areas. Three hours. Hudspeth.

### 295 Advanced Seminar

## Extra-Departmental Courses

### COLLEGE OF AGRICULTURE AND LIFE SCIENCES

#### AGRICULTURE (AGRI)

**99 Beginnings** Nine-week introduction to campus resources, identification of students' interests, goals, skills, and values to provide better understanding of themselves in relation to their program. Required for all freshmen in College of Agriculture and Life Sciences. One hour.

**195, 196 Special Topics** Appropriate for interdepartmental and interdisciplinary topics in Agriculture and Life Sciences. Permission of Dean's Office. Credit as arranged.

#### BIOLOGICAL SCIENCE (BSC)

**195, 196 Biological Sciences Seminar** Presentations and discussion of selected topics by students, staff, and invited guests. Suggested attendance for all seniors in Biological Science for one semester. One hour.

**197, 198 Undergraduate Research** Special study and research activity under direction of qualified staff member. Requires written proposal and final project report. *Prerequisites:* Junior/senior standing, research advisor and program chairperson approval. Credit as approved with maximum of six hours for undergraduate program.

### COLLEGE OF ARTS AND SCIENCES

#### GENERAL LITERATURE (GLIT)

**72 Romance Literature in Translation** Selected topics in romance literature. No knowledge of romance languages required. *Prerequisite:* One year course in any literature. Three hours.

**151, 152 Development of Prose Fiction** First semester: Latin, Spanish, French. Second semester: 1700 to present; French, Russian, English, and/or German. *Prerequisite:* Sophomore standing. Three hours.

**153 Greek Drama** Three hours. Ambrose. Alternate years, 1988-89.

**154 Greek Historians** Three hours. B. Rodgers. Alternate years, on demand.

**155 Ancient Epic** Three hours. Davison. Alternate years, on demand.

**156 Greek and Roman Satiric Spirit** Three hours. Gilleland. Alternate years, 1988-89.

**161, 162 German Literature in Translation** Lectures on the development of German literature; readings and discussion of representative works in English translations. No knowledge of German required. *Prerequisites:* Sophomore standing, one year course in any literature. Three hours. Mahoney, Richel, Scrase.

**173 Dante's Comedy** (Same as English 108.) A study of Dante's *Comedy* in Modern English translation. Three hours. Stephany. Alternate years, 1989-90.

**181, 182 Russian Literature in Translation** First semester: Russian masters of the 19th century. Second semester: 20th century writers from symbolists to present. *Prerequisites:* Sophomore standing, one year course in any literature. Three hours. McKenna.

**251, 252 Study of Movement, Genre, or Topic** Precise content of course announced before registration period, chosen from among the following (or similar) topics: Women in Literature; The Comic Spirit; The Grotesque in Modern Literature; Politics in Modern Literature; Existentialism; The Enlightenment. *Prerequisite:* Any 100-level literature course in any of the cooperating departments. Three hours.

#### LINGUISTICS (LING)

**101, 102** Introductory course to acquaint student with the

methods and theory of systematic observation and explanation of language phenomena (linguistics). *Prerequisite:* 101 for 102. Three hours. Clark, Woolfson. (Not offered 1988-89.)

### COLLEGE OF ENGINEERING AND MATHEMATICS

Technology—see page 179.

## Forestry (FOR)

### SCHOOL OF NATURAL RESOURCES

*Professors Hannah, Reidel, Whitmore (Program Chair); Associate Professors Armstrong, Bergdahl, DeHayes, Donnelly, Forcier, Newton; Assistant Professor Clausen; Extension Associate Professor Bousquet, McEvoy; Lecturer Turner; Adjunct Associate Professors Gregory, Sendak.*

**1 American Forestry** Forests and our quality of life; forest conservation eras; forest ownership; the profession of forestry; ethics; aspects of forest biology and basic forest measurements. Three hours. Armstrong.

**3 North American Trees (2-3)** Survey of principal forest trees of North America; their identification, silvics, and major uses. Primary emphasis directed toward trees of eastern U.S. (Not open to Forestry majors). Three hours.

**21 Dendrology (3-4)** Classification, silvical characteristics, and identification features of native and introduced trees and shrubs. Four hours. Hannah.

**73 Small Woodland Management (2-4)** Concepts of forest ecology, resource inventory, cultural practices, and multiple use management for small woodland areas. Three hours. Turner.

**120 Forest Ecology (2-4)** Forest environment and its effects on the development and distribution of forest communities. Introduction to population dynamics, systems and analysis, diversity, stability, ecosystem disturbances, and succession. *Prerequisites:* 21, Plant and Soil Science 161. Four hours. Donnelly, Hirth.

**122 Forest Ecosystem Analysis** An integrated field course to investigate, through quantification and interpretation, the flora, fauna, and abiotic components (soils, physiography, water, and microclimate) of a selected forest ecosystem. *Prerequisite:* Knowledge of plant identification, land measurements, and statistics recommended. Twenty days during summer session. Four hours. Donnelly, Turner.

**123 Silviculture (3-4)** Principles of regeneration, production, and culture of forest stands. *Prerequisites:* 120, Natural Resources 25. Four hours. Hannah. (Not offered 1988-89.)

**124 Forest Genetics** Concepts in general, population, and quantitative forest genetics and its application to the improvement of trees for artificial regeneration purposes. *Prerequisites:* Botany 4, junior standing. Three hours. DeHayes. Alternate years, 1988-89.

**126 Forest Ecology Field Trip** Assessment of southeastern forest ecosystems including Smoky Mountain communities, and upland and bottomland forests of the Georgia Piedmont and South Carolina Coastal Plain. Field trip at end of spring semester. *Prerequisites:* A course in plant identification, a course in ecology, permission of instructor. Two hours. Donnelly, DeHayes.

**132 Forest Fire Behavior and Management** Forest fire ecology and behavior; fire weather; causes and effects; danger measurement; prevention and management; prescribed fire in forest management; smoke management; fire simulation. *Prerequisite:* 120 or concurrent enrollment. Three hours. Bergdahl.

**133 Forest Entomology** (See Plant and Soil Science 107.) Three hours. Parker.

**134 Forest Pathology (2-4)** A survey of principal diseases of forest and shade trees emphasizing identification, morphology, ecology, epidemiology, and integrated disease management. *Prerequisites:* Botany 4, Zoology 9, or Biology 1, 2. Four hours. Bergdahl.

**140 Forest Biometry I (3-4)** Introductory concepts in forest biometry. Measurement of trees and forest products; forest sampling and inventory with application in multiple-use management. *Prerequisites:* Math. 19, Statistics 141. Four hours. Newton.

**146 Remote Sensing of Forest Resources (2-3)** Identification, interpretation, measurement, and mapping of forest resources from aerial photographs and other remote sensing devices. *Prerequisites:* Junior standing; a course in tree identification. Three hours. Whitmore.

**153 Forest Finance** Forestry investment analyses. Return on investment, net present value, land expectation value, sinking funds, and amortization schedules. Valuation based on anticipated net incomes. Managerial accounting. *Prerequisite:* A course in economics. One hour. Armstrong.

**155 Forest Taxation** Federal, state, and local taxation of forest properties. Income taxes, capital gains, and property taxes including various state laws on taxation based on current-use assessment. *Prerequisite:* A course in economics. One hour. Armstrong.

**157 Trade and Marketing of Forest Products** World trade and marketing of forest products. Consumer behavior, employment and productivity in forest products, appraisal of standing timber, marketing standing timber, and commodity markets. *Prerequisite:* A course in economics. One hour. Armstrong.

**162 Properties and Uses of Wood (2-4)** Properties, uses, and identification of commercial woods of the U.S. Manufacture of major wood products. *Prerequisite:* A course in tree identification. Three hours. Bousquet, Whitmore.

**163 Timber Harvesting (2-4)** Methods of harvesting timber under different forest conditions and silvicultural treatments; organization and costs of logging operations. *Prerequisites:* Junior standing, two courses in forestry. Three hours. Turner. Alternate years, 1989-90.

**176 Urban Forestry (2-4)** Value of trees in the urban environment; selecting, planting, and maintaining landscape trees; diagnosis and control of disease, insect, and injury problems. *Prerequisite:* A course in tree identification. Three hours. Hannah. Alternate years, 1989-90.

**185 Special Topics** Readings, investigations, and lectures in selected forest resource subjects. *Prerequisite:* Permission of instructor. Credit arranged.

**191 Forestry Practicum** Supervised work experience in forest resource area. *Prerequisite:* Permission of instructor. Credit arranged.

**205 Mineral Nutrition of Plants** (See Botany 205.) Three hours.

**221 Forest Soils and Site Relations (2-4)** Forest soils from an ecological perspective. Profile development, physical properties, roots, water relations, nutrient cycling, topographic factors, site quality, and the potential to produce biomass. *Prerequisites:* 120, Plant and Soil Science 161, permission. Three hours. Hannah. Alternate years, 1990-91.

**222 Advanced Silviculture (2-4)** Scientific basis and contemporary status of silvicultural practices. *Prerequisites:* 123, permission. Three hours. Hannah. Alternate years, 1989-90.

**225 Tree Structure and Function** The anatomy and physiology of woody plants with particular emphasis on those facets unique to trees. *Prerequisite:* Junior standing in a plant science curriculum. Three hours. Donnelly. Alternate years, 1988-89.

**229 Water Relations of Plants** Soil-plant water rela-

tions. Terminology and measurement of soil moisture. Absorption, transport, and transpiration by plants. Effects of water excesses and deficits. *Prerequisite:* Permission. Three hours. Donnelly, Klein. Alternate years, 1988-89.

**231 Integrated Forest Protection** Integration of concepts of forest protection using a holistic ecological approach to forest pest management. Detection, population dynamics, evaluation, prediction, and pest management considerations. *Prerequisites:* 133, 134 or permission of instructor. Three hours. Bergdahl. Alternate years, 1989-90.

**242 Advanced Forest Biometry (2-4)** Advanced principles of estimation, prediction, inventory, and evaluation of forest resources. Use of system analysis techniques in natural resource management. *Prerequisite:* 140 or permission. Three hours. Newton. Alternate years, 1989-90.

**244 Quantitative Assessments of Natural Resources** (See Natural Resources 244.) Three hours. Newton.

**251 Forest Policy and Administration** History of natural resource use and management in the U.S.; analysis of contemporary forest policy; organizational administration of forestry and related natural resource instructions. *Prerequisites:* Senior standing in Natural Resources or permission. Three hours. Reidel. (Not offered for graduate credit.)

**252 Forest Valuation** Appraisal of forests and associated real estate. Forest real estate principles. *Prerequisite:* 151 or six hours of economics. Two hours. (Associated one-hour project may be elected concurrently.) Armstrong.

**254 Advanced Natural Resource Policy** Advanced seminar in natural resource policy, emphasizing current issues in forest policy. *Prerequisites:* Graduate or advanced undergraduate standing; 251 or permission of instructor. Three hours. Reidel. Alternate years, 1988-89.

**271 Forestry Operations Research** Operations research procedures in forest management. Microcomputer approaches to queuing applications, replacement, inventory, linear programming, and simulation. *Prerequisite:* Computer Science, Math. 19, a 100-level course in Natural Resources, or permission. Three hours.

**272 Forest Management (2-2)** The planning and organization of forests for multiple-use sustained yield production: environmental impact statements. *Prerequisites:* 123, 140. Three hours. Armstrong, Newton. (Not offered for graduate credit.)

**275 Forest Watershed Management (2-4)** Concepts of forest hydrology and forest watershed management; emphasis on natural processes and impacts of quantity, quality, and seasonal distribution of flow from watersheds. *Prerequisite:* Natural Resources 102, junior standing or permission. Three hours. Clausen. Alternate years, 1989-90.

**285 Advanced Special Topics** Advanced special topics or seminars in forestry beyond the scope of existing formal courses. *Prerequisites:* Graduate or advanced undergraduate standing, permission of instructor. Credit as arranged.

**291, 292 Senior Research** Work on research problem under direction of a staff member. Findings submitted in written form as prescribed by department. *Prerequisites:* Senior standing, permission. Three hours. (Not offered for graduate credit.)

## Geography (GEOG)

### COLLEGE OF ARTS AND SCIENCES

*Professors Gade, Meeks, Miles, VanderMeer; Associate Professors Barnum, Bodman (Chairperson), Lind; Assistant Professor DeCola.*

*Note: The normal introductory sequence is 1, 2 although 3,2 is*

a recommended alternative especially for students in *Economics and Business Administration*.

**1 Introduction to Geography** Basic geographic concepts. The cultural diversity among people as it affects the organization and use of the environment. Three hours. I, II.

**2 World Natural Environments** The patterns of man's natural environment with particular attention to landforms, climate, soil, vegetation, and water resources. Three hours. I, II.

**3 Introduction to Economic Geography** Elementary spatial models of economic patterns, processes, and relationships. Three hours. Bodman, DeCola.

**16 Human Role in Changing the Face of the Earth** Geography and ecology of the human modification of the world's major regions. Three hours. Gade.

**17 Introduction to Urban and Regional Planning** Spatial, social, and economic patterns in contemporary cities and the planning problems these raise. Focus on Burlington metropolitan area. Three hours. Bodman.

**43 Weather and Climate** Elements of weather and climate and their interaction to produce world climate patterns. Daily weather analysis to facilitate understanding of various climatic systems. Three hours. Lind, Meeks.

**51 to 58** The regional courses numbered 51 to 58 listed below each concern the character and development of the contemporary cultural, economic, and political patterns of the area against the background of its physical and resource base. Three hours each.

**51 Africa** DeCola, Miles.

**52 Canada** Miles.

**53 The Soviet Union** Meeks.

**55 Europe** Barnum.

**56 Latin America** Gade.

**57 The United States** Meeks.

**58 China and Japan** VanderMeer.

**61 Vermont in New England** Physical, economic, and cultural patterns of Vermont in the context of New England. Evolution of the Vermont landscape; problems of land use planning and development. Three hours. Meeks.

**62 Geography of Place Names** Investigation and interpretation of the names found on maps of Vermont, North America, and Europe. Three hours. Barnum.

**74 Geography of Wine** Spatial and environmental aspects of wine production and consumption; types of wine and wine regions of the world. *Prerequisite:* Junior or senior standing. Three hours. Gade.

**81 Introduction to Cartography** Maps and map preparation, principles of map construction, information suitable for map presentation, techniques of map drawing, methods of map reproduction, graphs and frequency distributions. *Prerequisite:* Permission of instructor. Three hours. I, II. Barnum.

**85 Introduction to Remote Sensing** Geographic analysis and evaluation of aerial imagery produced by remote sensors and its relationship to environmental problems in the social and physical sciences. Three hours. Lind.

**95, 96 Introductory Special Topics** Introductory courses or seminars on topics beyond the scope of existing departmental offerings. See Schedule of Courses for specific titles.

**142 Physical Geography** Patterns and processes in the interactions between the earth, atmosphere, hydrosphere, and biosphere; effects of human intervention in environmental systems. *Prerequisite:* 2. Three hours. Lind.

**143 Climatology** Analysis of regional and local climatic data with special reference to climatic controls; special laboratory projects. *Prerequisite:* 43. Three hours. Lind.

**146 North American Resources** Identification and analysis of natural regions as they reflect elements of the physi-

cal environment. Emphasis on distributional patterns and resource significance. *Prerequisite:* 1, 2, 3, or 57. Three hours. Meeks.

**155 Historical Geography of Europe** (Same as History 155.) European geography within a framework of past times; the historical development and distribution of settlement, economic, and political patterns. *Prerequisite:* 55 or History 5, 6, 15, or 16. Three hours. Barnum.

**170 Historical Geography of the U.S.** (Same as History 170.) Physical setting of American historical development emphasizing the sequence of peoples and cultures which have occupied the land and their varied appreciation of its resources. *Prerequisite:* 57 or History 7 or 8. Three hours. Miles.

**171 Cultural Geography** Concepts and theories of cultural ecology, culture area, culture history, and the cultural landscape. *Prerequisites:* 1 or Anthropology 21, three additional hours in geography or anthropology. Three hours. Gade.

**173 Industrial Location and Regional Development** Classical and contemporary theories of location and measurement of spatial change. Locational planning in developed and developing areas. Problems of regional disequilibrium and growth strategies. *Prerequisite:* 3 or Economics 11. Three hours. Bodman.

**174 Agricultural Geography** World, national, and local rural land use patterns. Landscape elements as they reflect prevailing and historic agricultural patterns. Ecological and social problems of modern agriculture. *Prerequisite:* 1, 2, or 3, or Agricultural and Resource Economics 2 or 61, or Plant and Soil Science 11. Three hours. Meeks, VanderMeer.

**175 Urban Geography** Analysis of the morphology and function of cities. Consideration of urban growth and development, methods of classification, distribution, and theories of location. *Prerequisite:* 1, 3, or 17. Three hours. Barnum, Bodman.

**177 Political Geography** (Same as Political Science 177.) Location, resources, and distributional relationships of the variety of human factors as they bear on the structure and functioning of political units. Relationship between geopolitics and political geography. *Prerequisite:* 1 or 3, or Political Science 21, 51, or 71. Three hours. Miles.

**179 Cultural Ecology** (Same as Anthropology 179.) Interrelationships of social groups and their natural environments and resource bases, with primary emphasis on non-industrial cultures, examined from the perspectives of anthropology and geography. *Prerequisite:* 1 or 16 or Anthropology 21. Three hours. S. Pastner (Anthropology), Gade.

**181 Computer Cartography** Computer graphics as an alternative and supplement to manual cartography; advanced concepts in cartographic design; applications of computer mapping in planning and resource management. *Prerequisite:* 81. Three hours.

**183 Geography and Public Policy** Critical perspectives on the locational aspects of planning at a variety of geographic scales. *Prerequisite:* 3 or 17. Three hours. Bodman.

**191 Geography Internship** Supervised internship in applied geography working with a local public agency or private firm. Individually arranged. *Prerequisites:* Junior or senior standing, permission of department. One to six hours. Bodman, Meeks.

**193, 194 College Honors**

**195, 196 Intermediate Special Topics** Intermediate courses or seminars on topics beyond the scope of existing departmental offerings. See Schedule of Courses for specific titles.

**197, 198 Readings and Research**

**201 Perspectives on Geography** Geographic concepts and research methodology; the formulation, conduct, and presentation of a research effort. *Prerequisite:* Junior,

senior, or graduate standing with at least 12 hours in geography. Three hours.

**210 Special Topics in Regional Geography** Specialized study of a particular region. *Prerequisites:* Junior, senior, or graduate standing with at least 12 hours in geography, permission of instructor. Three hours.

**216 Biogeography** Processes and patterns of distribution, domestication, and human utility of plant and animal species and communities in varying environmental and historical contexts. *Prerequisite:* Nine hours in geography or biology. Three hours. Gade.

**233 Rural Planning** (See Agricultural and Resource Economics 233.)

**242 Problems in Physical Geography** *Prerequisite:* Senior or graduate standing with at least 12 hours in geography. Three hours. Gade, Lind, Meeks.

**261 Problems in Vermont Geography** *Prerequisite:* Senior or graduate standing with at least 12 hours in geography. Three hours.

**270 Problems in Human Geography** *Prerequisite:* Senior or graduate standing with at least 12 hours in geography. Three hours. Barnum, Bodman, Gade, Meeks, Miles, VanderMeer.

**281 Problems in Cartography** Special laboratory projects. *Prerequisites:* 81, junior, senior, or graduate standing with at least 12 hours in geography. Three hours. Barnum.

**285 Remote Sensing and Environmental Problems** (Same as Geology 274.) Research projects in remote sensing; application of multispectral data for environmental studies. *Prerequisite:* 85, Civil Engineering 210, or Forestry 146. Three hours. Lind.

**287 Spatial Analysis** Analysis of spatial pattern and interaction through quantitative models; introduction to measurement, sampling, and covariation in a spatial framework. *Prerequisite:* Junior, senior, or graduate standing with at least 12 hours in geography or graduate standing in planning. Three hours. Bodman.

### 297, 298 Readings and Research

## Geology (GEOL)

### COLLEGE OF ARTS AND SCIENCES

*Professors* Hunt (Chairperson), Stanley; *Associate Professors* Bucke, Doolan, Drake, Hannah, Mehrtens; *Adjunct Professors* Hatch, Ratte.

**1 Introductory Geology (3-3)** Process, agents, and their effects on materials, structures, and morphology of earth's crust. Laboratory includes field trips, study and interpretation of rocks, minerals, and maps. Four hours. Bucke.

**10 Geological Oceanography** Characteristics and development of the oceans, their basins and shorelines. Plate tectonics and related investigations. *Prerequisite:* 1 or introductory science course. Three hours. Bucke, Hunt.

**41 Plate Tectonics and Earth History (3-3)** Introduces students to the concepts of the new global tectonics and its role in shaping earth history. Labs stress graphical solutions to plate movements. Four hours. Doolan, Mehrtens.

**95, 96 Introductory Special Topics** Introductory courses or seminars on topics beyond the scope of existing departmental offerings. See Schedule of Courses for specific titles.

**101 Field Geology (0-12)** Geological evolution of western Vermont as seen through actual field mapping in the Burlington area. Specifically designed for sophomores majoring or minoring in geology or related sciences. *Prerequisite:* 1 or instructor permission. Four hours.

**110 Mineralogy and Optical Crystallography (3-3)** A study of the chemistry, crystallography, and optical properties of common rock-forming minerals. Laboratory includes use of petrographic microscopes in addition to hand specimen identification. *Prerequisite:* 1. Four hours. Drake.

**121 Geologic History of Life (2-3)** Survey of origin, preservation, and diversification of ancient life. Interaction of organisms with their environment and the effect that organisms have had on the evolution of earth. *Prerequisite:* 1, 10, or Biology 1, or equivalent. Senior Biology majors by permission only. Three hours. Hunt.

**131 Petrology (3-3)** Description, classification, and genesis of igneous, sedimentary, and metamorphic rocks, emphasizing field and petrographic evidence for petrogenetic and tectonic models. *Prerequisite:* 110. Four hours. Drake, Hannah, Mehrtens.

**151 Geomorphology** Examination and interpretation of landforms resulting from the action of rivers, glaciers, waves, and the wind. Emphasis on processes. *Prerequisite:* 1 or instructor permission. Three hours. Bucke.

**153 Stratigraphy and Sedimentation** Discussion of three major topics: (a) properties of physical sedimentology; (b) principles of stratigraphy and basin analysis; (c) comparison of modern and ancient environments. *Prerequisite:* 131 or concurrent enrollment. Three hours. Mehrtens.

**170 Geophysics** The structure of the solid earth, using seismic, magnetic, and gravitational methods. *Prerequisites:* Math. 20, Physics 16. Three hours. Detenbeck (Physics), Doolan.

**180 Soil Mechanics** (See Civil Engineering 180.) Four hours. Olsen.

### 193, 194 College Honors

**195, 196 Intermediate Special Topics** Intermediate courses or seminars on topics beyond the scope of existing departmental offerings. See Schedule of Courses for specific titles.

**197, 198 Research in Geology** Supervised research and readings in a selected field of geology. Students from allied sciences, mathematics, and engineering may elect a research problem that combines their major field of study and geology. *Prerequisite:* Consultation with staff. Three hours.

**201 Advanced Field Geology (1-6)** Advanced field mapping techniques, analysis of field data, preparation of geological maps and reports. *Prerequisite:* 260. Three hours. Doolan, Hannah, Mehrtens, Stanley.

**211 Advanced Mineralogy (2-3)** Crystallographic, chemical, and physical properties of minerals. Lab stresses advanced determinative techniques. *Prerequisite:* 110. Three hours. Drake.

**212 Clay Mineralogy (2-3)** Structure, composition, properties, occurrence, origin, distribution, and environmental significance of clay minerals. Laboratory techniques in the identification of clay minerals and measurement of their physical and chemical properties. *Prerequisite:* 110 or instructor permission. Three hours. Bucke.

**220 Invertebrate Paleontology (2-3)** Classification, geological distribution, evolution, paleoecology, and morphology of major invertebrate fossil groups. *Prerequisites:* 121, Biology 1, or equivalent. Three hours. Hunt.

**230 Advanced Igneous and Metamorphic Petrology** Application of phase equilibria, elemental and isotopic data, and textural interpretations to problems in igneous and metamorphic petrology, stressing modern theories of tectonics and petrogenesis. *Prerequisite:* 131. Four hours. Doolan, Hannah.

**235 Geochemistry** Application of basic concepts in chemistry to geological problems including solution geochemistry, mineral stability, and phase equilibria. *Prerequisites:* 131, Chemistry 1, 2. Three hours. Drake.



**237 Economic Geology** Distribution and mode of occurrence of principal metallic ores; geochemical methods used to develop models of ore genesis. *Prerequisites:* 101, 131. Three hours. Hannah.

**241 Clastic Depositional Systems** Selected readings and field studies emphasizing the interpretation of clastic sedimentary deposits including transportation, processes of sedimentation, and geomorphology of ancient and recent sedimentary environments. *Prerequisite:* 153. Three hours. Mehrtens. Alternate years.

**243 Clastic Petrology Laboratory** Study of clastic rocks in hand specimen and thin section. *Prerequisite:* Concurrent enrollment in 241. One hour. Mehrtens.

**245 Carbonate Depositional Environments** Paleoenvironmental analysis of carbonate rocks including selected readings, field investigations, and petrographic studies. *Prerequisite:* 153. Three hours. Mehrtens. Alternate years.

**247 Carbonate Petrology Laboratory** Study of carbonate rocks in hand specimen and thin section. *Prerequisite:* Concurrent enrollment in 245. One hour. Mehrtens.

**251 Recent Sedimentation (1-6)** Investigation of recent sedimentary environments using geolimnological and oceanographic techniques. Group and individual projects. *Prerequisite:* 153 or equivalent. Three hours. Hunt.

**252 Soil Classification and Land Use** (See Plant and Soil Science 261.) Three hours. Bartlett.

**256 Geology of Oil and Gas (2-3)** Origin, migration, and entrapment of petroleum. Geology and classification of source and reservoir rocks and traps. Methods of subsurface basin analysis. *Prerequisite:* 153. Three hours. Bucke.

**260 Structural Geology (3-3)** Rock deformation, description, and geometry of structural types, and the interpretation of structures of all sizes in terms of finite strain and causal stress fields. *Prerequisites:* 101, 110, Physics 31. Four hours. Stanley.

**270 Plate Tectonics** Development and current status of plate tectonic concepts with applications to selected parts of the globe. *Prerequisite:* 260. Three hours.

**272 a, b Regional Geology 272a** (1 hour) Discussion of the geology of a selected region of North America; **272b** (3 hours) A four-week summer field trip to the area in question. *Prerequisites:* 101, 110; 272a for 272b. Four hours.

**273 Geology of the Appalachians** Origin of mountain belts; the Appalachian mountain system discussed in terms of tectonics and geologic processes active in modern continental margins. *Prerequisites:* 101, 131. Three hours. Doolan.

**274 Remote Sensing of the Environment** (See Geography 285.) Three hours.

**295, 296 Advanced Special Topics** Advanced courses or seminars on topics beyond the scope of existing departmental offerings. See Schedule of Courses for specific titles.

## German (GERM)

### COLLEGE OF ARTS AND SCIENCES

*Professor Mieder (Chairperson); Associate Professors Mahoney, Richel, Scrase; Assistant Professor Schreckenberger.*

The first two semesters of a foreign language are excluded from the 45-hour limit on courses from a single department that can be counted toward the 122 hours required for the Bachelor of Arts degree.

**1, 2 Elementary German** Four hours.

**21, 22 German for Reading Knowledge** To develop reading proficiency in German for research or graduate study.

Does not fulfill distribution requirements. Credit not granted for both German 1, 2 and 21, 22. Freshmen and sophomores by permission only. Four hours.

**51, 52 Intermediate German** Composition and conversation. Guided conversation, discussion, and written work leading to free composition and oral presentations. Grammar review. *Prerequisites:* 1, 2 or equivalent for 51; 51 for 52. Three hours.

**95, 96 Introductory Special Topics** Introductory courses or seminars on topics beyond the scope of existing departmental offerings. See Schedule of Courses for specific titles.

**101, 102 Introduction to German Literature** Survey of German literature from the beginnings to the 20th century. *Prerequisite:* 52 or equivalent. Three hours. Mahoney, Richel, Schreckenberger, Scrase.

**121, 122 German Culture and Civilization** Emphasis on increasing oral and written command of the language. Class discussions focus on German history and culture. *Prerequisite:* 52 or equivalent. Three hours. Mahoney, Richel, Schreckenberger.

**193, 194 College Honors**

**195, 196 Intermediate Special Topics** Intermediate courses or seminars on topics beyond the scope of existing departmental offerings. See Schedule of Courses for specific titles.

**197, 198 Readings and Research**

**201 Proseminar: Methods of Research and Bibliography** Introduction to tools and methods of research. *Prerequisite:* 101 or equivalent. Three hours. Mieder.

**203 Development of German Intellectual Movements** A comprehensive survey of the history of ideas as a framework for the study of German literature. *Prerequisite:* 101, 102 or equivalent. Three hours. Mahoney.

**204 Courtly Epic and Minnesang** Cultural background and major works of medieval classicism. *Prerequisite:* 101, 102 or equivalent. Three hours. Mieder.

**205, 206 Goethe and Schiller and Their Time** Origin, development, characteristics and criticism of German Classicism. *Prerequisite:* 101, 102 or equivalent. Three hours. Mahoney, Richel, Scrase.

**207 19th Century Prose** Narrative prose of representative authors such as Kleist, Drost-Hülshoff, Stifter, Storm, and Keller. *Prerequisite:* 101, 102 or equivalent. Three hours. Mieder.

**208 19th Century Drama** Works by Kleist, Büchner, Grillparzer, Hebbel, Wagner, and the early Hauptmann. *Prerequisite:* 101, 102 or equivalent. Three hours. Richel.

**209, 210 The 20th Century** Selected works in poetry, prose, and drama by Brecht, George, Hauptmann, Hofmannsthal, Kafka, Thomas Mann, Rilke, and others. *Prerequisite:* 101, 102 or equivalent. Three hours. Schreckenberger, Scrase.

**221, 222 Advanced Composition and Conversation** Oral and written practice in German of advanced difficulty with emphasis on stylistics. *Prerequisite:* 121, 122 or equivalent. Three hours. Mieder, Schreckenberger.

**232 History of the German Language** Historical linguistic development of the German language from earliest times to the present. No knowledge of the older stages of the language is presupposed or required. *Prerequisite:* 121, 122 or equivalent. Three hours. Mieder.

**281, 282 Senior Seminar** Readings and research. Required of all senior concentrators. Three hours.

**295, 296 Advanced Special Topics** Advanced courses or seminars on topics beyond the scope of existing departmental offerings. See Schedule of Courses for specific titles.

### GENERAL LITERATURE

**161, 162 German Literature in Translation** (See course description under Extra-Departmental Courses.)

## Hebrew (HEBR)

### COLLEGE OF ARTS AND SCIENCES

Lecturer Lewin.

**1, 2 Elementary Hebrew** The spoken language of everyday use with oral, aural, and written practice in speaking, reading, and comprehension. Four hours. Lewin.

**51, 52 Intermediate Hebrew** Reading, translation, and discussion in Hebrew of texts selected to show the development of Hebrew culture from Biblical times to the present. Three hours. Lewin.

## Historic Preservation (HP)

### COLLEGE OF ARTS AND SCIENCES

**201 Architecture, Landscape, and History** (Same as Art 201 and History 201.) An examination of methods for deciphering the underlying cultural and environmental forces that have shaped the nation's buildings, towns, cities, and rural landscapes. *Prerequisites:* One advanced course in one of the following areas: American history, architectural history, historical or cultural geography, archaeology or by permission. Three hours. Liebs.

**202 Historic Preservation** Special topics. Current offerings include: Conservation Techniques for Historic Structures, Historic Preservation, Development Economics, Historic Preservation Law. Three hours.

**203 Conservation Techniques for Historic Structures** An overview of historic building technology including basic techniques of scientific field and laboratory investigations; seminars and demonstrations on preserving wood, plaster, paint, and masonry by nationally-recognized architectural and conservation specialists. *Prerequisites:* 201, familiarity with the building trade. Three hours. Visser.

**204 Historic Preservation: Development Economics** Survey of economic, financial aspects of real estate development pertaining to preservation and adaptive use of historic buildings (market studies, pro-formas). Field trips. Actual proposal development for underutilized properties. *Prerequisite:* 201. Three hours. Lang.

**205 Historic Preservation Law** Legal issues in conservation of the built environment. Basic legal techniques for protection of historic structures (historic districts, protective legislation, easements, covenants). Study of significant court decisions. *Prerequisite:* 201. Three hours. Kellogg.

## History (HIST)

### COLLEGE OF ARTS AND SCIENCES

Professors Andrea, Davison, Felt, Hand, Hutton, Liebs, Metcalfe, Overfield (Chairperson), Schmokel, Seybolt, Spinner, Stefens, Stoler, Stout; Associate Professors McGovern (Director of Graduate Studies), True; Assistant Professors Rodgers, See, Wu, Youngblood; Adjunct Professor Morrissey; Lecturer Visser.

History course numbers are designed to indicate method of instruction and expected preparation level of students, as follows:

**1-20 Civilization Surveys** Open to freshmen and sophomores, but primarily designed for freshmen. Generally emphasize the textbook-lecture-exam approach.

**21-99 Specialized Introductory Courses** Designed for sophomores and juniors, open to all except graduate stu-

dents. Generally the format emphasizes lectures and discussion. Short papers, book reviews, etc., will be required in addition to exams. No prerequisites.

**100-199 Advanced Intermediate Courses** Intended primarily for juniors and seniors with specific prerequisites. Discussion-lecture, with some seminar type work. Evaluation methods tend to emphasize written work other than exams.

**200-299 Advanced (Seminar) Courses** Advanced work in interpretation, research, and writing. Seminar format, limited enrollment. Primarily for students majoring in history (or related disciplines) and graduate students. Substantial prerequisites.

**1 World History to 1500** Survey of global history from humanity's earliest civilizations to the age of European overseas expansion. Three hours. Andrea.

**2 World History Since 1500** Character, development, and emerging interdependence of the world's major civilizations since 1500, emphasizing the impact of Europe on the non-European world. Three hours. Overfield.

**5 European Civilization to 1815** Introduction to political, social, and intellectual movements which have shaped the foundations of Western civilization: from the Renaissance to the French Revolution. Three hours.

**6 European Civilization, 1815 to 1945** Survey emphasizing ideas and institutions which have helped shape Western society and culture from the Napoleonic Era to the end of the Second World War. Three hours.

**7, 8 History of the U.S.** Survey from the pre-Revolutionary period to the present. Three hours.

**9 Ancient Mediterranean Civilization** Detailed study of Athens in the 5th century B.C., continuing to the rise of Rome through the first century A.D. (Students who have already taken 106 may not take 9.) Three hours. Rodgers.

**15 The Birth of Europe** Survey of history of Western Europe from the late Roman Empire to the stabilization of Medieval Civilization. Three hours. Andrea.

**16 The High and Later Middle Ages** Western Europe from the Age of the Crusades to the Renaissance. Three hours. Andrea.

**20 The Study of History** Introduction to methods of studying the past. Use of works of major historians as means of investigating the ways in which historians think and write history. Three hours.

**21, 22 History of Science** Survey of the history of the physical and biological sciences from antiquity to the present. Stresses science as an intellectual activity, within the contemporary context of philosophy, religion, and social organization. Three hours. Steffens.

**25 Biography** Readings in the history and criticism of biography, the role of the individual in history, and biographies of individuals. Three hours.

**27, 28 Ideas in the Western Tradition: Integrated Humanities** Great books of Western civilization in their historical setting. First semester: Greece and Rome. Second semester: Renaissance to Existentialism. *Prerequisites:* Concurrent enrollment in English 27, 28 and Religion 27, 28. Concurrent enrollment in Integrated Humanities Program. Three hours. Hutton.

**31 Traditional Chinese Civilization** Historical examination of the thought, social structure, politics, economics, science, literature, art, and music of traditional China. Three hours. Seybolt.

**32 History of Japan** Survey of Japanese political, social, economic, and aesthetic thought and institutions from 600 A.D. to the present. Three hours. Seybolt.

**33 Introduction to the Modern History of Latin America** Lecture survey of Latin American history which concentrates on the post-independence period. Selected national histories studied. Three hours. True.

**36 The Modern Middle East** Major historical developments in the Middle East from the late 18th century to the present. Three hours.

**37 Introduction to African History** Lecture survey: traditional Africa, the European impact, colonial rule, African nationalism and independence. Three hours. Schmokel.

**40, 41 World History Since 1945** First semester: The Soviet Union, Eastern Europe, Western Europe, and the U.S. Second semester: Asia, Africa, and Latin America. Three hours. Schmokel, Seybolt, Spinner.

**50, 51 English History** Political and social history of England. First semester: Middle Ages and Tudor-Stuart. Second semester: 1715 to the present. Three hours. Metcalfe, Spinner.

**52 Modern Germany and its Historical Background** Lecture survey of German history from 1871, including consideration of major events and forces which shaped German society and politics from the Reformation to the 19th century. Three hours. Schmokel.

**53 French History** Survey of the major historical forces which have shaped modern French civilization (1700-1871). Principal themes: Absolutism, Enlightenment, French Revolution, 19th Century Society and Culture. Lectures and discussions. Three hours. Hutton.

**54 History of Russia and Eastern Europe** Broad survey from the Middle Ages to the present time, emphasizing political history since 1815. Three hours. Youngblood.

**55 Modern Irish History** Ireland 1600 to present. English subjugation of Ireland, Anglo-Irish, emergence of Irish nationalism, Irish Literary Renaissance, Irish Free State, and ongoing problem of Northern Ireland. Three hours. Spinner.

**56 Introduction to Scandinavia.** History, culture, and contemporary life of Scandinavia (including Finland), emphasizing an area rather than a country-by-country approach. Basic historical turning points, examples of literary and artistic expression, and the region's efforts to solve problems of modern society. Some comparisons with social reform efforts of U.S. Three hours. Felt.

**70 Black History** Economic, social, political, and intellectual developments in U.S. history as they have affected and been affected by the Black American; emphasis on the period since 1865. Three hours.

**71 Vermont History** Survey of Vermont history from early times to the present. Three hours. Hand.

**72 History of Women in the U.S.** Survey of the origins and changes in images, status, and roles of women in American society since the colonial period. Three hours. McGovern.

**75, 76 Canadian History** Introduction to history of Canada, from earliest French exploration and settlement to present, concentrating on New France, British North America, achievement of self-government, international relations, and issues of cultural diversity. First semester: To 1867. Second semester: 1867-present. Three hours. See.

**79 Rural America** Survey of rural-agrarian side of American history from colonial times to present. Topics include history of farming methods from medieval Europe to age of agribusiness, Frontier Thesis, agrarian protest movements, and culture of rural America. Three hours. Stout.

**80 U.S. Military History** Development of the American military establishment within the framework of American history from the colonial era to the present. Three hours. Stoler.

**95, 96 Introductory Special Topics** Introductory courses or seminars on topics beyond the scope of existing departmental offerings. See Schedule of Courses for specific titles.

**105 Archaeology and History of the Ancient Near East** Survey of primary civilizations of Egypt and Mesopotamia and the secondary cultures of Anatolia, Syria-Palestine, Assyria, and Iran, with major emphasis on archaeological

evidence. *Prerequisite:* 1 or 9 or appropriate work in Classics. Three hours. Davison.

**106 History of Greece** Survey of history of ancient Greece from prehistoric times (emphasizing the Minoan and Mycenaean cultures) to the Hellenistic Age. *Prerequisite:* 1 or 9 or appropriate work in Classics. Three hours. Davison.

**107 History of Rome** Survey of history of ancient Italy from prehistoric times (emphasizing the Italic peoples, the Etruscans, and Greek colonization) to the age of Justinian. *Prerequisite:* 1 or 9 or appropriate work in Classics. Three hours. Davison, Rodgers.

**111 The Renaissance** European society from the 14th to early 16th century, emphasizing the transition from medieval to "modern" society and the roots of Renaissance Italy's cultural and artistic brilliance. *Prerequisite:* 5 or 16. Three hours. Overfield.

**112 The Reformation** European society from the Renaissance to mid-17th century. Emphasis on religious struggles growing out of Protestant Reformation and their impact on the social, political, economic, and cultural movements of era. *Prerequisite:* 5 or 16. Three hours. Overfield.

**116 The Crusades: 1095-1291** The evolution of western Europe's crusading ideal and the impact of the movement on Latin, Byzantine, Muslim, and Jewish societies. *Prerequisite:* One of the following: 1, 5, 15, 16. Three hours. Andrea.

**120 Special Methods in Secondary Education for the Social Studies** (Same as Education 179.) Social studies curricula and selected social studies topics. (Not acceptable toward fulfilling Arts and Sciences College major requirements.) *Prerequisite:* Acceptance in teacher certification program. Three hours. True.

**121 Quantitative Methods in Historical Research** Applications of quantitative methods to selection and analysis of historical materials. Emphasis on history of the family in Vermont compared to assessments of the American family by other social historians. Use of University's computer facilities. *Prerequisite:* Statistics 111 or permission of instructor. Three hours. McGovern, See.

**122 Philosophy of History** (Same as Philosophy 132.) Investigation of theories of history from perspectives of both historians and philosophers. *Prerequisites:* Six hours of history or philosophy. Three hours. Steffens.

**123 American Biography** Investigation and portrayal of personalities; the uses of biography in the study of American history. Subjects selected to represent a variety of vocations and aspects of history. *Prerequisite:* 7 or 8. Three hours.

**124, 125 Intellectual History of Modern Europe** Emphasis upon ideas in their relation to major political and social movements. First semester: Humanism, the Scientific Revolution, and the Enlightenment (1500-1800). Second semester: The Modern Era. *Prerequisites:* For 124, 5; for 125, 6. Three hours. Hutton, Overfield.

**126, 127 Intellectual History of the U.S.** An examination of the interaction between intellectuals, the public, and social institutions as a means to understanding how ideas relate to the social and institutional needs of particular historical periods. The effects of movements such as Puritanism, democracy, Darwinism, progressivism, and the search for self on past and present discussed. *Prerequisites:* For 126, 7; for 127, 8. Three hours. Felt.

**128 Science and Culture** Study of science as integral part of culture of our age, emphasizing published works of leading scientists, mathematicians, and "humanists" of 20th century. *Prerequisite:* 22, or six hours of European History or Philosophy 112 or science major. Three hours. Steffens.

**129 The Scientific Revolution** Interrelationship between scientific activity and social change during 16th and 17th centuries in Europe. Study of early stages of "Scientific Revolution," emphasizing lives and works of Copernicus, Kepler, Galileo, Newton. Special emphasis on broad philoso-

phical, religious, artistic, and social context of their times. *Prerequisite:* 21 or six hours of European History or Philosophy 112 or junior/senior majors in science. Three hours. Steffens.

**131 Modern China** Examination of Chinese history from 1800 to 1949, including discussion of Western imperialism, breakdown of the Confucian order, and 20th century struggle to find a viable alternative, culminating in Communist victory of 1949. *Prerequisite:* Six hours of history; 31 recommended. Three hours. Seybolt.

**132 People's Republic of China** Examination of domestic and foreign affairs of China from 1949 to the present. *Prerequisite:* Six hours of history; 31 recommended. Three hours. Seybolt.

**133 Topics in the History of Modern Latin America** Topics include plantation economy, slavery, race relations, immigration, militarism, economic development, *indigenismo*, and influence of U.S. Students encouraged to do independent research and study on Latin American topics of their choice. Classroom emphasis on dialogue and question-asking rather than lecture and recitation. *Prerequisite:* 33. Three hours. True.

**134 History of Mexico** Reading knowledge of Spanish strongly recommended. *Prerequisite:* 33. Three hours. True.

**137 Problems in the History of Modern Africa** Topics include African response to European penetration (collaboration vs. resistance), theories and practices of colonial rule, ideologies and organizational forms of African nationalism, and problem of development in present-day Africa. *Prerequisite:* 37. Three hours. Schmokel.

**150 Tudor-Stuart England** England from 1485 to 1660, emphasizing the period from the 1530's to the 1640's (the Henrician Reformation to the Revolution). *Prerequisite:* 5 or 50. Three hours. Metcalfe.

**151 Victorian England** Selected topics in the 19th century English history, emphasizing "industry and empire," changing class relationships, and the growth and development of political parties. *Prerequisite:* 6 or 51. Three hours. Spinner.

**152 Political and Social History of Modern Germany** Political development and changing social and economic structure of Germany during the Bismarckian empire, the Weimar Republic, the Nazi dictatorship, and the post-war period. *Prerequisite:* 52. Three hours. Schmokel.

**153 France in the Contemporary World** French history since 1870; the Commune and the decline of the revolutionary movement; emergence of mass politics; art and society of the "Belle Epoque;" French Fascism; Vichy; French Communism; Religious Renewal; Existentialism; demise of the French colonial empire; de Gaulle; student protest of 1960's; the "American challenge." *Prerequisite:* 53. Three hours. Hutton.

**154 The Russian Revolution and the Soviet Regime** Detailed study of the revolutionary movement, the revolutions of 1917, Marxism, Leninism, and the evolution of the Soviet Regime to 1939. *Prerequisite:* 54. Three hours. Youngblood.

**155 Historical Geography of Europe** (Same as Geography 155.) Three hours.

**158 Modern Spain** (Same as Spanish 158.)

**170 Historical Geography of the U.S.** (Same as Geography 170.) Three hours.

**171, 172 Social History of the U.S.** Selected topics in history of American society, including community structures, family life, work patterns, value systems, social class and mobility. *Prerequisites:* For 171, 7 or 72; for 172, 8 or 72. Three hours. McGovern.

**173, 174 History of U.S. Foreign Relations** First semester: 1763-1900. Second semester: 1900-present. *Prerequisites:* For 173, 7; for 174, 8. Three hours. Stoler.

**175 Canadian-American Relations** Historical examination of Canada's relationship with the U.S. from settlement to the present, with particular emphasis on diplomacy in the

19th and 20th centuries. *Prerequisites:* Three hours in U.S. or Canadian history. Three hours. See.

**176 History of Quebec** French-speaking Canada from New France to the Parti Quebecois. Examines Canada's political, economic, and cultural duality. *Prerequisite:* Three hours in Canadian History or Canadian Studies. Three hours. See.

**181 Colonial America, 1607-1791** Survey of colonial period of U.S. history from earliest settlements through establishment of the Constitution. *Prerequisite:* for any seminar course in the Colonial period and American Revolution. *Prerequisite:* Six hours of history or other social science, of which History 5 is highly recommended. Three hours.

**182 The Early National Period** Chronological survey of U.S. history from 1790 to 1847. *Prerequisite:* 7. Three hours. True.

**183 U.S. History 1847-1876** History of the U.S., 1847-1876, emphasizing the sectional conflict of the 1850's, the Civil War, the life of Lincoln, and Reconstruction. *Prerequisite:* 7. Three hours.

**184 The U.S. in the Age of Industrialization** Chronological survey of U.S. history from 1876 to 1914. *Prerequisite:* 8. Three hours.

**185 The U.S. as a World Power** History of the U.S. from 1914 to 1945. *Prerequisite:* 8. Three hours. Stoler.

**186 American History Since 1945** Topical review of U.S. history since 1945 emphasizing problems of interpreting and reconstructing the recent past. *Prerequisite:* 8. Three hours. Hand.

**191 Internship in History** Supervised cooperative internship work in history in archives, museums, libraries, etc. To be individually arranged for each student. *Prerequisites:* Junior or senior standing, permission of department. Three to six hours.

**193, 194 College Honors**

**195, 196 Intermediate Special Topics** Intermediate courses or seminars on topics beyond the scope of existing departmental offerings. See Schedule of Courses for specific titles. *Prerequisites:* Junior or senior standing, six hours of history. Three hours.

**197, 198 Readings and Research** *Prerequisites:* May be prescribed by an individual instructor, junior or senior standing. Three hours.

*Prerequisites for Seminar Courses (all following courses): Enrollment limited to juniors, seniors, and graduate students who have taken at least 12 hours of previous work in history. Individual instructors will prescribe specific prerequisites appropriate for their seminars. Students who wish to enroll in seminars should check the current Schedule of Courses for these prerequisites.*

**203 Colonial Origins of American Society** An examination of how, in 17th and 18th century America, European patterns of life and systems of belief eroded and were replaced with a distinctly American society. *Prerequisites:* Four courses in the social sciences including at least two in history (5 and 7 plus one at the 100 level recommended), and at least one in anthropology, economics, geography, religion, or sociology. Three hours. Stout.

**204 Colonial Origins of American Government** Evolution of American government (local to national levels) from the English background through the establishment of the U.S. Constitution. Emphasis on the political and constitutional aspects of the American Revolution. *Prerequisites:* Four courses in the social sciences including at least two in history (at least one above 100, 203 recommended) and one in political science. Three hours. Stout.

**210, 211 Seminar in History of Traditional Societies** Three hours.

**220, 221 Seminar in Historical Methods, Historiography, History of Ideas** Three hours.

- 222 Seminar in Comparative History** Three hours.
- 230, 231 Seminar in Third World History** Three hours.
- 250, 251 Seminar in Modern Europe** Three hours.
- 261 Seminar in Vermont History** Topical approach to the Vermont experience through original research utilizing primary sources available at the University of Vermont, the Vermont Historical Society, and the Vermont State Library. *Prerequisites:* 71, permission of instructor. Three hours.
- 270, 271 Seminar in American Statesmen** Thought and practical politics of American statesmen. First semester: 1783-1865. Second semester: Since 1865. Three hours.
- 278 Seminar in Foreign Policy of the USSR** (Same as Political Science 278.) Historical topical study of Soviet foreign relations since 1917, including the international Communist movement and ideological, economic, and strategic aspects. Three hours.
- 280, 281 Seminar in Early American History** Three hours.
- 282, 283 Seminar in Modern American History** Three hours.
- 284 Seminar in Canadian History** Three hours.
- 285 Seminar in Quebec History** Three hours.

## Mathematics (MATH)

### COLLEGE OF ENGINEERING AND MATHEMATICS

*Professors Ashikaga, Chamberlain, Cooke, Haugh, Moser (Chairperson), Wright; Associate Professors Archdeacon, Burgmeier, Costanza, Dinitz, Foote; Assistant Professors Dummit, Hamdy, Mickey, Sands, Son, Wilson, Zwick; Lecturers Ellis-Monaghan, Johansson, Karstens, Kost, Lacey, Lawlor, MacPherson, Morency, Puterbaugh; Research Associate Professors Aleong, McAuliffe; Research Assistant Professor Fenwick.*

*The Mathematics Department provides instruction for students throughout the University. The following lists of courses, grouped according to their prerequisites, are provided for the information of students seeking a first course in mathematics. Consultation is available at the Department Office.*

*Minimal background one year of high school algebra:*

*Math. 1, Elementary College Algebra (evenings and summers only)*

*Two years of high school algebra and one year of geometry:*

*Math. 2, Plane Trigonometry*

*Math. 9, College Algebra*

*Math. 10, Precalculus Mathematics*

*Math. 17, Applied Finite Mathematics*

*Math. 19, Fundamentals of Calculus I*

*Four years or more of college preparatory mathematics in high school:*

*Math. 17, Applied Finite Mathematics*

*Math. 19, Fundamentals of Calculus I*

*Math. 21, Analytic Geometry and Calculus I*

*Students entering with Advanced Placement in Calculus may take Math. 20, 22, or 121 as their first mathematics course at UVM.*

**1 Elementary College Algebra** Review of fundamental operations and a more extensive study of fractions, exponents, radicals, linear, and quadratic equations, ratio, proportion, variation, progressions, and the binomial theorem. Covers topics normally included in intermediate algebra in high school. Students who have satisfactorily completed two years of high school algebra, or the equivalent, will receive no credit for this course. Offered only in Evening Division and

Summer Session. *Prerequisite:* One year of high school algebra. Three hours.

**2 Plane Trigonometry** Trigonometric functions, their graphs and other properties, solution of triangles, trigonometric equations and identities, and inverse trigonometric functions. May not be taken for credit concurrently with, or following receipt of, credit for any mathematics course numbered 20 or above. Credit not given for both 2 and 10. *Prerequisite:* 1 or 9. Three hours. Offered only in Evening Division and Summer Session.

**9 College Algebra** Sets, relations, and functions with particular attention to properties of algebraic, exponential, and logarithmic functions, their graphs and applications. May not be taken for credit concurrently with, or following receipt of, credit for any mathematics course numbered 18 or above. Credit not given for both 9 and 10. *Prerequisites:* Two years of secondary school algebra, one year of secondary school geometry. Three hours.

**10 Precalculus Mathematics** Skills in working with numerical, algebraic, and trigonometric expressions are developed in preparation for 21. May not be taken for credit concurrently with, or following receipt of, credit for any mathematics course numbered 19 or above. Credit not given for both 2 and 10 nor 9 and 10. *Prerequisites:* Two years of secondary school algebra, a good background in geometry and trigonometry. Three hours.

**15, 16 Fundamental Concepts of Elementary School Mathematics** Comprehension of operations with counting numbers and natural numbers, measurements, and informal geometry provide background for algebra, statistics, and probability. Open only to students in elementary education. *Prerequisites:* 15 for 16. Three hours.

**17 Applied Finite Mathematics** Elementary matrix operations, graphing, simple linear programming, probability and the mathematics of finance with many practical applications. *Prerequisites:* Two years of secondary school algebra or 9 or 10. Three hours.

**19 Fundamentals of Calculus I** Introduction to limits and differential calculus with a wide variety of applications. Students interested in intensive use of mathematics should take 21. Credit not given for more than one of the courses 19, 21. *Prerequisite:* 9, 10, or sufficiently strong background in secondary school algebra and trigonometry. Three hours.

**20 Fundamentals of Calculus II** Introduction to integral calculus and linear algebra with a wide variety of applications. A student who completes 20 may be admitted to 22. *Prerequisite:* 19.\* Three hours.

**21\*\* Calculus I** Introduction to calculus of functions of one variable including: limits, continuity, techniques, and applications of differentiation and integration. Credit not given for more than one course in the pair 19, 21. *Prerequisites:* 10; or 9 and 2; or strong background in secondary school algebra and trigonometry. Four hours.

\*Math. 21 may be accepted as the prerequisite for Math. 20 with permission of department.

\*\*Those who are deficient in high school mathematics for their chosen curriculum are urged to attend summer school prior to their first semester in college.

**22 Calculus II** Logarithmic, exponential, and trigonometric functions. Further techniques and applications of integration. Taylor polynomials, sequences and series, power series. *Prerequisite:* 21. Four hours.

**31 Elementary Numerical Methods** Computer-aided problem-solving techniques including root-finding, interpolation, approximation, numerical integration, and systems of equations. *Prerequisite:* Computer Science 11. *Corequisite:* Math. 22. Not applicable toward the requirements for a major in mathematics. Three hours.

**102 Fundamentals of Mathematics** Topics include logic and proofs, set theory relations and functions. Credit not

given for both 102 and 104. *Prerequisite:* Math. 22. Three hours.

**104 Fundamentals of Mathematics of Computation** Introduction to mathematical theory and techniques underlying computer science. Set theory, graph theory, Markov chains, game theory, semi-groups, free monoids, finite groups, and wreath products. *Prerequisite:* 22, Statistics 151 desirable. Three hours.

**121 Calculus III** Polar coordinates. Vectors; vector-valued functions. Calculus of functions of several variables: partial derivatives, gradient, divergence, curl, multiple integrals, line integrals, Stokes' and Green's Theorems. *Prerequisite:* 22. Four hours.

**124 Linear Algebra** Matrices, linear dependence, vector spaces, linear transformations, characteristic equations and applications. *Corequisite:* Math. 121. Three hours.

**162 Geometry for Elementary and Middle School Teachers** An informal, investigative approach to geometry. Extensive use of discovery experiences inductive procedures as opposed to the traditional emphasis on deductive process found in high school geometry. Credit not given for Engineering and Math. curriculum. *Prerequisite:* 15 or a teaching certificate. Three hours. Alternate years, 1988-89.

**173 Basic Combinatorial Theory** Introduction to basic combinatorial principles emphasizing problem-solving techniques. Enumeration, Generating Functions, Fibonacci Numbers, Pigeonhole Principle, and Graph Theory included. *Prerequisite:* 102 or 104. Three hours.

**179 Teaching Secondary School Mathematics** Contemporary secondary school mathematics curricula, their content from an advanced standpoint, unifying mathematical concepts and their implications at various levels, and introduction of selected mathematical topics. Intended only for students with an interest in teaching secondary school mathematics. Not acceptable as part of any mathematics requirement for a degree. *Prerequisites:* Education 178, acceptance to teacher education, or permission of instructor. Three hours.

**191, 192 Special Project** An approved project under guidance of a staff member and culminating in a written report. Involvement with off-campus groups permitted. *Prerequisites:* Junior or senior standing, approval of department chairperson. One to three hours as arranged.

**193, 194 College Honors**

**195 Special Topics**

**207 Probability Theory** (Same as Statistics 251.)

**221 Deterministic Models in Operations Research** Techniques of linear and dynamic programming and game theory. Graphs and tree models. Classical problems discussed, problem formulation stressed. *Prerequisites:* 124; 121 desirable. Three hours. Alternate years, 1988-89.

**222 Stochastic Models in Operations Research** Stochastic processes and their use in analysis of industrial problems. Markov chains, queueing theory, linear and dynamic programming under uncertainty. *Prerequisites:* 207 or Statistics 151. Three hours. Alternate years, 1988-89.

**223 Introduction to Formal Language Theory** (Same as Computer Science 223.) Introduction to theory and applications of context-free languages. Phrase structure and context free grammars, normal forms, pushdown automata, decision problems, power series in noncommuting variable, applications to parsing. *Prerequisites:* 104, 217 and/or 218 highly recommended. Three hours.

**224 Analysis of Algorithms** (Same as Computer Science 224.) Introduction to both analytical and experimental techniques in algorithm analysis. Basic algorithm design strategies. Introduction to complexity theory. *Prerequisites:* 102 or 104; 121; 124; 173; Computer Science 104. Three hours.,

**230 Ordinary Differential Equations** Solutions of linear ordinary differential equations, the Laplace transforma-

tion, and series solutions of differential equations. *Prerequisite:* 121. *Corequisite:* 124. Credit will not be granted for more than one of the courses Math. 230 and Math. 271.

**236 Calculus of Variations** Necessary conditions of Euler, Legendre, Weierstrass, and Jacobi for minimizing integrals. Sufficiency proofs. Variation and eigenvalue problems. Hamilton-Jacobi equations. *Prerequisite:* 230. Three hours. Alternate years, 1989-90.

**237 Introduction to Numerical Analysis** Error analysis, root-finding, interpolation, least squares, quadrature, linear equations, numerical solution of ordinary differential equations. *Prerequisites:* 121; 124 or 271; knowledge of computer programming. Three hours.

**238 Numerical Differential Equations** Numerical solution of differential equations: initial-value and boundary-value problems; finite difference and finite element methods. *Prerequisite:* 237, either 230 or 271 recommended. Three hours.

**240 Operational Mathematics** Fourier series, orthogonal functions, transforms and boundary value problems. *Prerequisite:* 230 or 271. Three hours.

**241 Real Analysis I** Topology of Euclidean  $n$ -space, compactness, connectedness, limits and continuity; pointwise and uniform convergence, differentiation and integration of sequences and series of functions. *Prerequisites:* 102, 121, 124. Three hours.

**242 Real Analysis II** Differentiation, Taylor series, Riemann integration and change of coordinates in several variables. Inverse and Implicit Function Theorems. *Prerequisite:* 241. Three hours.

**243 Introduction to Theoretical Computer Science** (Same as Computer Science 243.)

**251 Abstract Algebra I** Basic theory of groups, rings, modules, fields, vector spaces, homomorphisms, and isomorphisms. *Prerequisites:* 102 or 104. Three hours.

**252 Abstract Algebra II** Finite fields and field extensions, Galois theory leading to the insolvability of quintic equations, linear transformations, rational and Jordan canonical forms. *Prerequisite:* 251. Three hours. Alternate years, 1989-90.

**253, 254 Topology** The elements of point set topology; closed sets and open sets in metric spaces, continuous mappings, connection, Peano curves, separation theorems and homotopy. *Prerequisites:* 102 or 104, 253 for 254. Three hours. Alternate years, 1989-90.

**255 Elementary Number Theory** Divisibility, prime numbers, Diophantine equations, congruence of numbers, and methods of solving congruences. *Prerequisite:* 102 or 104. Three hours.

**257 Topics in Group Theory** Topics may include abstract group theory, representation theory, classical groups, Lie groups. *Prerequisite:* 251. Three hours. Alternate years, 1987-88.

**260 Foundations of Geometry** Geometry as an axiomatic science; various non-Euclidean geometries; relationships existing between Euclidean plane geometry and other geometries; invariant properties. *Prerequisite:* One year of calculus. Three hours.

**261 The Development of Mathematics** Historical development of mathematical sciences emphasizing interrelations among them. Individual assignments correspond to background and interests of students. *Prerequisite:* Nine hours of college mathematics. Three hours.

**264 Vector Analysis** Gradient, curl and divergence, Green, Gauss, and Stokes Theorems, applications to physics, tensor analysis. *Prerequisite:* 121. Three hours. Alternate years, 1989-90.

**271 Applied Mathematics for Engineers and Scientists** Matrix Theory, Vector Analysis, Linear Ordinary Differ-

ential Equations. Emphasis on methods of solution, including numerical methods. *Prerequisite:* 121. Three hours. No credit for mathematics majors. For a mathematics concentration, a sequence beginning with 230 is advised. Credit not granted for more than one of the courses Math. 230 and Math. 271.

**272 Applied Analysis** Partial Differential Equations of Mathematical Physics, Calculus of Variations, Functions of a Complex Variable, Cauchy's Theorem, integral formula. Conformal mapping. *Prerequisite:* 230 or 271. Three hours.

**273 Topics in Combinatorics** Topics will vary according to instructor and may include graph theory, coding theory, Latin squares and combinatorial designs. *Prerequisite:* 102 or 104. Three hours. Alternate years, 1988-89.

**274 Numerical Linear Algebra** Direct and iterative methods for solving linear equations, least square factorization methods, eigenvalue computations, ill-conditioning and stability. *Prerequisite:* 237. Three hours.

**283 Junior-Senior Seminar** Students required to give presentations on selected topics. *Prerequisite:* Permission of instructor. One hour.

**293, 294 Undergraduate Honors Thesis** Program of reading and research culminating in written thesis and oral presentation. Honors notation appears on transcript and Commencement Program. Contact Mathematics Department Chairperson for procedures. Six to eight hours. (Not offered for graduate credit.)

**295 Special Topics** For advanced students in the indicated fields. Lectures, reports, and directed readings on advanced topics. *Prerequisite:* Consent of instructor. Credit as arranged. Offered as occasion warrants.

## Mechanical Engineering (ME)

### COLLEGE OF ENGINEERING AND MATHEMATICS

*Professors Flanagan, Francis, Hermance (Chairperson), Hundal, Outwater, Pope, von Turkovich; Assistant Professors Beaty, Huston; Lecturer Brown; Adjunct Professor Ferris-Prabhu.*

**2 Graphical Communication (1-2)** Orthographic and isometric views, dimensioning, sketching, surface layout, graphs. *Prerequisite:* Enrollment in, or application for admission to, engineering. Two hours.

**12 Dynamics (3-0)** Kinematics and kinetics of particles and rigid bodies in two and three dimensions. Computer-aided analysis. *Prerequisites:* Civil Engineering 1, Math. 121. Three hours.

**14 Mechanics of Solids (3-0)** (Same as Civil Engineering 100.) Stress, strain, temperature relationships, torsion, bending stresses and deflections. Columns, joints, thin-walled cylinders. Combined stresses and Mohr's circle. *Prerequisites:* Civil Engineering 1, Math. 121, ME 12 or concurrent enrollment. Three hours.

**41 Thermodynamics and Heat Transfer (3-2)** Principles of engineering thermodynamics; applications of these principles to thermodynamic cycles; introduction to heat transfer. *Prerequisites:* Physics 31 with 21, Math. 22. Four hours.

**42 Engineering Thermodynamics (3-0)** Properties and processes of fluids; the perfect gas, and approximate relationships for real gases; application of thermodynamics principles to areas such as combustion, mixtures, power cycles, gas compression, and refrigeration. *Prerequisite:* 41. Three hours.

**93 Bioengineering Applications of Physical Principles I (3-3)** Applications of the principles of mechanics, thermodynamics, and mechanical engineering to an understanding of the structure and function of the human body and to diagnostic and therapeutic instrumentation. Four hours.

**101 Engineering Materials (3-0)** Physical and mechanical metallurgy, structures, atomic, crystalline, amorphous;

thermodynamics, multicomponent systems, phase equilibria; diffusion; electronic; structural changes, microplasticity, dislocations; fracture. *Prerequisite:* 14. Three hours.

**102 Materials II (3-0)** Mechanical behavior: elastic, plastic. Testing: tensile, compression, impact, fatigue, creep. Failure: fracture, fatigue, corrosion. Modification of properties; polymers, ferrous and nonferrous metals, ceramics. *Prerequisite:* 101. Three hours.

**111 System Dynamics (3-0)** Modeling of systems with mechanical, electrical, fluid, and thermal elements. Linear systems analysis. Response of vibratory and feedback systems. Computer simulation. *Prerequisite:* Junior standing in engineering. Three hours.

**123, 124 Junior Laboratory (0-3), (0-3)** Engineering measurements, data analysis and theory of experimentation. Experiments with fluids and material testing machines and instrumentation for dynamic measurements. *Prerequisites:* Junior standing in ME. One hour.

**143 Fluid Mechanics (3-0)** Dynamics of an ideal fluid; energy and momentum relationships; similitude; flow in conduits; boundary layer mechanics; compressibility phenomena; wing theory; hydrodynamic lubrication; fluid machines and controls. *Prerequisites:* 14. Three hours.

**144 Heat and Mass Transfer (4-0)** Principles of heat transfer; conduction, convection, radiation; steady and unsteady state; the electric analogy; diffusion and mass transfer; applications to heat and mass transfer problems. *Prerequisite:* 143. Four hours. Hermance.

**150 The Engineering Profession (3-0)** Professional practice of engineering. Laws, ethics, engineering economy, liability, insurance, and contracts. *Prerequisites:* Senior standing or permission of instructor. Three hours.

**152 Safety Engineering (2-0)** (Same as Business Administration 171.) Safety management and standards, recognition and control of environmental, mechanical, electrical, and chemical hazards, fire prevention, personal protective equipment. *Prerequisite:* Senior standing in engineering or business administration or permission of instructor. Two hours.

**161 Manufacturing Engineering I (3-0)** Mechanical and thermal processing of metallic and nonmetallic materials; casting, forming, cutting, grinding, joining, high energy forming, EDM, ECM, Laser, and ultrasonic. *Prerequisite:* Senior ME standing. Three hours.

**162 Manufacturing Engineering II (3-2)** Machine tools engineering. Flexible manufacturing systems. Robotics in manufacturing, automatic factory, computer-aided manufacturing. *Prerequisite:* Senior engineering standing. Four hours.

**170 Mechanical Design I (4-0)** Stress and displacement analysis; the design process; design of mechanical components, cams, gears, fasteners, springs, brakes, beams, shafts, etc. *Prerequisite:* Junior ME standing. Four hours.

**171 Mechanical Design II (2-2)** Design optimization; engineering elasticity; introduction to finite element analysis; design projects. *Prerequisite:* 170. Three hours.

**172 Mechanical Design III (3-2)** Experimental stress analysis; probabilistic design, system modeling, linkage synthesis; projects from industry. *Prerequisite:* 171. Four hours.

**175 Human Factors (2-3)** (Same as Business Administration 175.) Human sensory capabilities and limitations, design of information input, human motor activities and space relationships, introduction to work measurement. *Prerequisite:* Junior standing. Three hours.

**176 Plant Planning and Design (3-3)** (Same as Business Administration 176.) Analysis of facilities and services requirements, material handling, office and clean room layout, mathematical and computer techniques, safety and plant conservation. *Prerequisite:* Junior standing in engineering or business administration, or permission of instructor. Four hours.

**183 Senior Laboratory (0-3)** Advanced engineering



experimentation and data collection and reduction techniques applied to several mechanical engineering areas. *Prerequisite:* Senior standing in ME. One hour.

**185-186 Senior Project (0-3/6)** An individual engineering study designed to particular interest of the student, utilizing and synthesizing the student's total mechanical engineering educational experience. *Prerequisite:* Senior standing. Fall: two hours. Spring: General Option, one hour; Biomechanical Option, two hours.

**191 Thesis (0-9)** Investigation of a research or design project under supervision of assigned staff member culminating in acceptable thesis. *Prerequisites:* Senior standing, departmental permission. Three hours.

### 193, 194 College Honors

### 195 Special Topics

**202 Dynamics (3-0)** Advanced topics in dynamics of particles and systems of particles. Kinematics and kinetics of rigid bodies. Euler's equations of motion. Gyroscopic effects. *Prerequisite:* 12. Three hours.

**232 Micromanufacturing Technologies (3-0)** Crystal processes; thin films; vacuum, chemical vapor deposition; selection of integrated circuit materials and processes; manufacturing of semiconductors, printed circuit boards, microchips, wafers. Micromachining, microfilming, precision instruments. *Prerequisite:* Senior standing or department permission. Three hours.

**241 Combustion Processes (3-0)** Combustion thermodynamics; chemical kinetics; laminar flames, premixed and diffusion; turbulent flames; ignition, explosion, and detonation; droplet combustion; flame spread; large scale fires; rocket combustion. *Prerequisite:* Senior or graduate standing. Three hours.

**242 Modeling and Simulation of Energy Systems (3-0)** Modeling and computer simulation of individual elements of, and integrated systems for, power generation, including heat transfer and chemical reactions. Introduction to stochastic simulation. *Prerequisite:* Senior or graduate standing. Three hours.

**243 Compressible Flow (3-0)** Foundations of compressible flow; isentropic flow; normal and oblique shock waves; Prandtl-Myer flow; flow with friction and with heating and cooling; flow in electric and magnetic fields; potential flow; linearized flows; method of characteristics. *Prerequisite:* 143. Three hours.

**245 Advanced Heat Transfer (3-0)** Transient heat conduction; integral methods; convection; formulation and solution; boiling, condensation; radiant heat exchange in enclosures and with emitting-absorbing gases, advanced view factors. *Prerequisite:* Senior ME standing or permission of instructor. Three hours.

**253 Tribology I: Friction, Lubrication, and Wear (3-2)** Examination of failed mechanical components. Topography, contact mechanics of real surfaces. Friction/wear theories: elastic, plastic contact. Lubrication mechanics. Lubricant properties. Bearings and their selection. *Prerequisite:* Senior or graduate standing in College of Engineering and Mathematics. Four hours.

**272 Mechanical Behavior of Materials (3-0)** Elastic and plastic behavior of single crystals; dislocations; approximate plastic analysis; anisotropic materials; hardness; residual stress, brittle, transitional and ductile fractures; fatigue; damping; creep and surface phenomena. *Prerequisite:* 233. Three hours.

**273 Corrosion of Materials** Corrosion principles: electrochemical, environmental, and metallurgical aspects. Corrosion testing. Corrosion prevention. Seawater corrosion. Biological corrosion. Material selection. *Prerequisite:* 102. Three hours.

**277 Composite Materials** Fibers, matrices. Unidirectional

and short fiber composites. Analysis of orthotropic lamina and laminated composites. Experimental characterization. *Prerequisite:* 102. Three hours.

**281, 282 Seminar (1-0)** Presentation and discussion of advanced mechanical engineering problems and current developments. *Prerequisite:* Senior or graduate engineering enrollment. One hour.

**295 Special Topics** Content is dictated by expanding professional interest in newly developing, or recently developed, technical areas in which there is particular need or opportunity. *Prerequisites:* Senior or graduate standing. Three hours.

## Medical Technology (MEDT)

### SCHOOL OF ALLIED HEALTH SCIENCES

*Associate Professors Ezekiel, Lachapelle (Chairperson), Reed, Sullivan; Assistant Professor Howard; Clinical Assistant Professor Russell; Instructor Czerniawski; Clinical Instructors Albarrelli, Ballard, Blomfield, Cote, Dopp, Durett, Fiore, Giroux, Hammond, Isham, Letourneau, Page, Pouden, Purchase, Scanlon, Standage, Thibault, Thomas.*

**1 Introduction to Medical Technology** Introduction to profession and to UVM curriculum. Discussion of academic requirements, professional and health issues. No credit. Lachapelle.

**3 Medical Terminology** Terminology related to medical science and hospital services. Required of all students in Medical Technology. Open to Health Sciences students by permission of instructor. Fall. One hour. Lachapelle.

**23 Introduction to Clinical Chemistry** Lectures and laboratory experiences in basic chemical tests performed on body fluids. *Prerequisite:* Chemistry 2. Fall. Four hours. Sullivan.

**34 Introduction to Hematology** Lectures and laboratory experiences in blood cells and coagulation factors. Spring. Three hours. Reed.

**54 Introduction to Clinical Microbiology** Lectures and laboratory experiences related to the identification of bacteria in clinical specimens. Spring. Two hours. Ezekiel.

**61 Introduction to Immunohematology** Lectures and laboratory experiences in the basic principles of immunology and their application in immunohematology. Fall. Two hours.

**102 Clinical Microscopy** Lectures and laboratory experiences dealing with urinalysis, identification of parasites, and the analysis of various body fluids. Spring. Two hours.

**120 Hospital Practicum: Clinical Chemistry** Practical experiences at the Medical Center Hospital. Fall and spring. Three hours. Sullivan.

**122 Advanced Clinical Chemistry** Advanced theory and practice dealing with analysis of body fluid chemical components. Spring. Three and a half hours. Sullivan.

**130 Hospital Practicum: Hematology** Practical experiences at the Medical Center Hospital. Fall and spring. One hour. Reed.

**131 Advanced Hematology** Advanced theory and practice dealing with blood cells and coagulation factors. Fall. Three hours. Reed.

**150 Hospital Practicum: Clinical Microbiology** Practical experiences at the Medical Center Hospital. Fall and spring. One and a half hours. Ezekiel.

**155 Advanced Clinical Microbiology** Advanced instruction in the study of clinically significant microorganisms, infectious disease process, and laboratory methods used for the isolation and identification of microorganisms from clinical specimens. Fall. Three hours. Ezekiel, Lachapelle.

**160 Hospital Practicum: Immunoematology** Practical experience at Medical Center Hospital and Red Cross Blood Center. Fall and spring. One hour.

**162 Advanced Immunoematology** Advanced theory and experience related to human blood groups and transfusion practice. Spring. Three hours.

**195 Principles of Education and Management** Introduction to procedures and methods of instruction in various teaching situations and to basic principles of management, supervision, and administration. Fall. Three hours. Ezekiel.

**196 Senior Seminar** Review of case studies for clinical correlation. Introduction to other laboratory sections. Spring. Two hours.

**197-198 Research Concepts** Discussion of research methodology with or without individual research participation. *Prerequisite:* Medical Technology major. Fall and spring. Variable credit.

**229 Seminar: Clinical Chemistry** Discussion of recent advances in Clinical Chemistry. One hour. Sullivan. (Not offered for graduate credit.)

**239 Seminar: Hematology** Discussion of recent advances in Hematology. One hour. Reed. (Not offered for graduate credit.)

**242 Immunology** Basic concepts and applications of the human immune system. Spring. Four hours. Lachapelle. (Not offered for graduate credit.)

**249 Seminar: Immunology** Discussion of recent advances in immunology. One hour. Lachapelle. (Not offered for graduate credit.)

**259 Seminar: Clinical Microbiology** Discussion of recent advances in Clinical Microbiology. One hour. Ezekiel. (Not offered for graduate credit.)

**269 Seminar: Immunoematology** Discussion on recent advances and practices used in transfusion of patients. Spring. One hour. (Not offered for graduate credit.)

## ***Merchandising, Consumer Studies, and Design (MCSD)***

### COLLEGE OF AGRICULTURE AND LIFE SCIENCES

*Associate Professor Loker (Chairperson); Assistant Professors Dever, Kolodinsky, Scannell, Walsh; Instructor Wilson; Lecturers Ashman, Chupack, Vreeman.*

**15 Design (1-4)** Design principles from nature applied to visual art. Materials and techniques in composition. Emphasis on color in selection and creation of aesthetic and functional design. Three hours. Atwood, Chupack.

**16 Sketching and Illustration (1-4)** Techniques of sketching, color rendering, and scale drawing in relation to nature forms, the human figure, and interior space. Preparation of portfolio. *Prerequisite:* 15. Three hours. Chupack. Spring.

**20 Textiles: Fiber to Fabric (2-2)** Today's fibers, fabrics, and finishes. Consumer problems and responsibilities in selection, use, and care. Three hours. Dever. Spring.

**22 Apparel Construction and Analysis (1-4)** Basic concepts related to apparel construction, pattern and fabric selection. Analysis and evaluation of ready-to-wear. Three hours. Wilson.

**25 Career Seminar** Integrated look at professional aspects and opportunities available to students. May enroll up to four times. One hour. Spring.

**51 Housing, Consumers, and Society** An introduction to factors influencing consumer choice in housing includ-

ing social-psychological, economic, and community aspects. Three hours. Walsh. Alternate years, 1989-90. Fall.

**56 Consumer Management Principles** Application of the management process of decision making for individuals and/or families in the use of human and material resources. Three hours. Kolodinsky. Spring.

**58 Introduction to Consumer Problems** Overview of problems facing consumers in contemporary life emphasizing consumer education, information, and protection. Three hours. Walsh. Fall.

**107 Fashion Design and Trend Analysis (2-2)** Analysis of 20th century clothing trends and innovative designers. Creating and rendering original designs. *Prerequisite:* 15. Three hours.

**114 Weaving: Spinning and Hand Techniques (1-4)** An introduction to spinning and weaving emphasizing hand methods as practiced in past and present cultures. *Prerequisite:* A course in design. Three hours. Atwood.

**115 Surface Design and Printing** Application of design to fabric and paper surfaces. Emphasis on repeat patterns derived from natural and historic motifs. *Prerequisite:* A design course or departmental permission. Three hours. Atwood. Fall.

**116 Weaving (1-4)** Introductory course in four harness loom weaving. Application of design fundamentals to woven textiles. *Prerequisites:* 15 or departmental permission; junior standing. Three hours. Atwood.

**117 History of Costume** Costume throughout history and its interrelationship with economic, political, social, and cultural settings, emphasizing adaptations to ready-to-wear and the stage. *Prerequisite:* Art 6 or Theatre 1. Three hours. Fall.

**120 Textile Dyeing and Finishing (2-2)** Review of textile fibers emphasizing chemical structures and properties. Interaction of dyes and finishes with textile fibers. Application of dyes and finishes to fabric. *Prerequisites:* 20, Chemistry 42, junior standing. Three hours. Dever. Fall.

**121 Physical Testing of Textiles (2-2)** Introduction to textile testing standards and equipment. Testing and evaluation of physical properties of selected fabrics. *Prerequisites:* 20, Chemistry 42. Three hours. Dever. Spring.

**122 Apparel Design I (1-4)** Principles of apparel design using flat pattern methods. Garments analyzed for design and construction techniques. Development of basic sloper from which original designs are created. *Prerequisite:* 22 or Theatre 40 or permission of instructor. Three hours. Fall.

**125 Retail Management** Organization of retail institutions and the functions of personnel management, buying, and merchandising as related to fashion industry. *Prerequisite:* Economics 11. Three hours. Vreeman. Fall.

**126 Fashion Marketing and Promotion** Marketing concept as it applies to fashion. Developing the store through advertising and sales promotion, visual merchandising, and customer relations. *Prerequisite:* 125. Three hours. Vreeman. Spring.

**127 Consumer Motivation** Analysis of decision making toward consumer choices from a sociological/psychological perspective, emphasizing the impact of social class, family structure, cultural background, and behavior. *Prerequisites:* A psychology course; junior standing. Three hours. Kolodinsky. Spring.

**128 The Consumer and Advertising** Examination of the principles of advertising, promotion, and publicity related to consumers. Emphasis on research, legislation, and consumer reaction to consumer motivation techniques. *Prerequisites:* A psychology course; sophomore standing. Three hours. Kolodinsky. Fall.

**153 Interior Design** Application of design fundamentals to interior environment. Study of space, materials, and furnishings relating to interiors. *Prerequisite:* 15 or departmental permission. Three hours. Atwood. Fall.

**155 Consumer Economics** Examination of economic principles as they relate to the consumer and analysis of consumer interactions with public and private sector institutions. *Prerequisite:* Economics 12. Three hours. Walsh. Spring.

**157 Consumer Law** Analysis of the statutes, regulations, and case law that protect consumers from unfair and deceptive advertising and sales practices. *Prerequisite:* Sophomore standing. Three hours. Ashman. Fall.

**158 Personal and Family Finance** An examination of personal and family financial management concepts and topics within various income levels and stages in the life cycle. *Prerequisites:* Economics 11 or equivalent. Three hours. Walsh. Spring.

**159 Consumer Assistance Program** Jointly sponsored by the University and Vermont Attorney General. Under supervision of an attorney, students respond to phone and mail requests for consumer information and handle consumer complaints. *Prerequisite:* Permission of instructor. Three to six hours. Ashman.

**190 Professional Development Workshop** Develop creative use of skills to attain career objectives, refine decision-making strategies, and increase self-awareness through communication. Discussion format with group participation and interaction. *Prerequisite:* Junior or senior standing. Two hours. Fall.

**195 Special Topics** Lectures, laboratories, readings, or projects relating to contemporary areas of study. *Prerequisite:* Varies with course. Enrollment may be more than once, accumulation up to 12 hours.

**196 Field Experience** Professionally-oriented field experience jointly supervised by faculty and business or community representative. Total credit toward graduation in 196 and 296 cannot exceed 15 credits. Sophomore standing only.

**197 Design Workshops I** Short courses dealing with specific areas related to design, fashion, and textiles. Enrollment may be more than once up to six hours. *Prerequisite:* 15. One hour.

**222 Apparel Design II (1-4)** Creative designing through a combination of flat pattern and draping techniques. Problems requiring original solutions relate fabrics to the design of the garment. *Prerequisites:* 15, 122. Three hours. (Not offered for graduate credit.) Spring.

**231 Advanced Workshops** Independent laboratory work. Emphasis on planning, design, research, management, techniques, production, and evaluation. *Prerequisite:* Completion of highest level course in Related Art. May be repeated with permission of instructor. Three hours. Atwood, Loker. Spring. (Not offered for graduate credit.)

**291 Special Problems** Reading, discussion, and special field and/or laboratory investigations. *Prerequisite:* Departmental permission. Students may enroll more than once for a maximum of 12 hours. One to six hours.

**295 Special Topics** Lectures, laboratories, directed readings, and projects on advanced topics as announced. *Prerequisite:* Departmental permission. Credit as arranged.

**296 Field Experience** Professionally-oriented field experience under joint supervision by faculty and business or community representative. Total credit toward graduation in 196 and 296 cannot exceed 15 credits. *Prerequisite:* Departmental permission. Credit arranged up to 15 hours. (Not offered for graduate credit.)

*ny, Schaeffer, Wallace (Chairperson); Associate Professor Sjogren; Visiting Assistant Professor Silverstein; Research Professor J. Moehring; Research Associate Professor Raper; Research Assistant Professor Rutkowski; Lecturer Tessmann.*

**55 Introductory Microbiology (2-4)** Study of microorganisms, especially bacteria, their structure, development, and activities. *Prerequisite:* Four hours of chemistry. Two hours and lab (two hours) as 57. Sjogren. Also offered each spring. Fall term reserved for Allied Health Science students except by permission of instructor.

**195 Special Topics** *Prerequisite:* Permission of instructor. Credits negotiable.

**197, 198 Undergraduate Research** Undergraduate honors students accommodated in individual research projects sponsored by department member. Arrangement with individual department member and approval of department chairperson. Credits negotiable.

**203 The Mammalian Cell in Biomedical Research** Cellular and molecular biology of vertebrate cells in culture; principles and techniques of cell tissue and organ culture and their application to problems in cell biology and medicine. Laboratory exercises provide practical experience. Designed for biology students of varied training. *Prerequisite:* Permission of instructors. Four hours. T. Moehring, Schaeffer. Alternate years.

**211 Molecular Genetics I** Analysis of organization, replication, and expression of genetic material in prokaryotes. Standard methods of bacterial and bacteriophage genetics, including fundamentals of recombinant DNA technology presented. Recommended prerequisite for Molecular Genetics II (see Botany 252). *Prerequisite:* Permission of instructor. Three hours. Novotny. Alternate years.

**220 Environmental Microbiology (2-3)** The activities of microorganisms, primarily bacteria, in air, soil, and water. *Prerequisite:* A previous course in microbiology. Three hours and lab (one hour) as 221. Sjogren. Alternate years, 1989-90.

**222 Clinical Microbiology** Comprehensive study of human pathogenic microorganisms and their disease states in man. Collecting and handling specimens, pathogenic bacteriology, medical mycology, and virology. Laboratory sessions provide practical experience in handling and identifying these pathogens. *Prerequisite:* 55 or its equivalent. Immunology recommended but not required. Four hours. Fives-Taylor.

**223 Immunology** Analysis of the immune response with respect to structure and function of immunoglobulins, immunocompetence, tolerance, ontogeny and phylogeny of adaptive immunity, immunogenetics of transplantation, hypersensitivity states, and theories of antibody formation. *Prerequisite:* Consent of instructor. Three hours. Alternate years. Silverstein.

**225 Virology** Introduction to the nature of viruses, their physical, chemical, and biological characteristics with special reference to cell-virus interaction, viral replication, pathogenesis, viral inhibitors, and oncogenic viruses. *Prerequisite:* Permission of instructor. Three hours. Alternate years. Silverstein.

**254 Microbial Biochemistry (2-4)** The chemical composition and metabolism of microbial cells. *Prerequisites:* 55, 201, or permission of instructor. Three hours and lab (one hour) as MICR 255. Sjogren. Alternate years, 1988-89.

## Microbiology (MICR)

COLLEGE OF AGRICULTURE AND LIFE SCIENCES AND  
COLLEGE OF MEDICINE  
Professors Albertini, Fives-Taylor, Gump, T. Moehring, Novot-

## Military Studies (MSTD)

Chairperson LTC Alexander; LTC Wheeler, Majors Gerlach, Taft; Captain Neuser; Sergeant Major Palacios; Master Sergeant LeClair.

*Note: Total allowable credit for Military Studies varies by college/school; check with Department of Military Studies. Military Studies courses are open to all students, regardless of major or intentions to complete the full cadet program. A weekly leadership laboratory is mandatory for all students enrolled in MSTD 1-5. Students interested in pursuing an officer's commission through the ROTC should refer to page 40, or check with the Department of Military Studies.*

**1 Introduction to Military Studies (1)** Military heritage; customs and traditions of the service; historical development of the Army and its role in support of national objectives; diversity of missions performed during peace and war. *Prerequisite:* Freshman or sophomore standing or departmental permission. One hour. Gerlach.

**2 War and Society (2)** War and military systems in historical perspective. Effects of society on war and of war on society; the military thinkers; issues in the control of military force. *Prerequisite:* 1. Freshman or sophomore standing or departmental permission. Two hours. Neuser.

**4 Contemporary World Military Scene (2)** Examines international uses of military forces viewed against a background of long-range national concerns, especially of the U.S., NATO, U.S.S.R., The Warsaw Pact, and China. *Prerequisite:* 1. Freshman or sophomore standing or departmental permission. Two hours. Neuser.

**5 Simulations and Wargaming (3)** Examines military and nonmilitary use of modeling, simulation, and wargaming. Surveys types of models, simulation, and wargaming in present use. Uses role-playing simulations and existing wargames to play test selected models. *Prerequisite:* 1. Freshman or sophomore standing or departmental permission. Three hours. Gerlach.

**\*12 Rappelling** (½ Physical Education credit) Basic instruction in rope management, rope installation, and rappelling, consisting of both classroom instruction and outdoor practical exercises.

**\*13 Wilderness Survival** (1 Physical Education credit) Instruction in wilderness survival techniques, to include land navigation, procurement of food, water, and shelter.

**101 Special Studies** (Academic credit as arranged) In-depth analysis of topics broached in 1, 2, 3, or 4. Guided research. Student proposes topic. Two hours.

**102 Special Studies** (Continuation of 101) Two hours.

**\*\*201 Leadership and Management I (2)** Fundamentals of leadership. Leader's role in directing and coordinating efforts of individuals and small groups in obtaining goals. An orientation into military occupational specialties. Fall. Two hours. Wheeler. (Not offered for graduate credit.)

**\*\*202 Leadership and Management II (2)** Instruction and practical application of skills required of a military leader. Introduction to management of small organizations. Development of leadership, counseling, and communication skills. Military land navigation. Spring. Two hours. Wheeler. (Not offered for graduate credit.)

**\*\*203 Leadership and Management III (2)** Investigation of selected leadership and management problems associated with personnel management and ethics. The military as a profession and the responsibilities of an officer. Fall. Two hours. Alexander. (Not offered for graduate credit.)

**\*\*204 Leadership and Management IV (2)** Analysis of the Army structure and management of organization. Administration of the Uniformed Code of Military Justice and Army correspondence. Spring. Two hours. Alexander. (Not offered for graduate credit.)

\*Prerequisite for 12, 13: Freshman or sophomore standing or departmental permission.

\*\*Prerequisite for 201, 202, 203, and 204: Acceptance into Army ROTC Advanced Course or departmental permission.

**Leadership Laboratory** A 50-minute practical training exercise incorporating classroom instruction while developing unit cohesion and leadership techniques.

## Music (MUS)

### COLLEGE OF ARTS AND SCIENCES

*Professors J. Ambrose, Chapman (Chairperson), T. Read, Wigness; Assistant Professors Brown, Neiweem, Nelson; Lecturers Atherton, Boyer, Brubaker, Fleming, Goeghegan, Klimowski, E. Metcalfe, Parker, Parshley, E. Read, Scoones, Soons, Toner.*

*Students in all music courses are required to attend a designated portion of major ensemble concerts, faculty recitals, and formal student recitals as part of the course requirements. Music majors in all degree programs are expected to regularly participate in ensembles. A reasonable division between large and small ensembles should be observed.*

### THEORY AND COMPOSITION

**3 Introductory Music Theory** Rudiments of notation, rhythm, melody, harmony, scales, form, and terminology. Three hours.

**31, 32 Basic Musicianship** Melodic and rhythmic dictation, sight singing, and elementary harmony and counterpoint. Three hours.

**131, 132 Intermediate Theory** Contrapuntal and harmonic dictation; intermediate counterpoint and harmony. Music analysis. *Prerequisites:* 31, 32; 131 for 132, or consent of instructor. Three hours. Concurrent enrollment in 133, 134.

**133, 134 Intermediate Theory Lab** Sight singing, keyboard, conducting skills. Concurrent enrollment in 131, 132. One hour.

**231, 232 Advanced Theory** Advanced counterpoint and harmony; analysis of form in music. *Prerequisites:* 132, 134; 231 for 232, or consent of instructor. Three hours.

**233 Arranging** Characteristics of instruments; arranging for ensembles. *Prerequisite:* 132 or consent of instructor. Three hours.

**234 Orchestration** Studies in orchestral scoring. *Prerequisite:* 233 or consent of instructor. Three hours.

**235 Fugal Composition** Study of representative baroque, classical, and contemporary fugal procedures through analysis and composition. *Prerequisites:* 231 or consent of instructor. Three hours.

**237, 238 Composition** Creative work in free composition with instruction according to needs and capabilities of individual student. *Prerequisite:* 231, 235, or consent of instructor. Three hours. May be repeated for credit.

**240 Seminar in Musical Analysis** Advanced study of musical forms. Comparison of standard approaches to harmonic, motivic, and rhythmic analysis. *Prerequisites:* 235, consent of instructor. Three hours.

**241 Senior Project in Music Theory** Advanced study focusing on a theoretical topic under direction of assigned staff member. *Prerequisite:* Senior standing as Theory major. Three hours.

**297, 298 Advanced Reading and Research** Studies in composition or related special topic under direction of assigned staff member.

### HISTORY AND LITERATURE

**1 Introductory Music Listening** A concise view of Western music from plain song to the present, emphasizing baroque, classical, romantic, impressionistic, and modern music. Involves both in-class and outside listening. Three hours.

**4 The Experience of Music** Explores the phenomenon called "music" through aural examination of its composite elements: rhythm, melody, harmony, texture, form. Musical examples drawn from Western traditional and contemporary repertory. *Prerequisite:* Nonmajors only. Three hours.

**11, 12 Survey of Western Music** Historical study of development of Western music. First semester: Earliest times through the baroque. Second semester: Classical period to contemporary. Involves both in-class and outside listening. Three hours.

**42 Introduction to the History of Jazz** Survey of New Orleans, Chicago, Swing, bebop, cool, funky, and free jazz styles through the work of important soloists and bands, 1915-1965. Three hours. Brown. Not offered 1988-89.

**44 Introduction to the Blues and Related Traditions** Survey of performers, musical procedures, technical means, and traditional lyrics of songsters, jug bands, gospel, barrel house piano, and important blues styles to about 1955. Three hours. Brown. Not offered 1988-89.

**111 Classical, Romantic** Chronological, analytical study of representative examples of music literature from approximately 1750-1900: Mozart, Haydn, Beethoven, Schubert, Berlioz, Schumann, Chopin, Liszt, Brahms. *Prerequisites:* 1, 3, 11, 12 or permission, ability to read music. Three hours. Offered in alternate years.

**112 Contemporary Music** Development and style characteristics of 20th century music from the late romanticists to the experimentalists. Both European and American composers presented. *Prerequisites:* 1, 3, 11, 12, or permission, ability to read music. Three hours. Offered in alternate years.

**113 Medieval, Renaissance** Chronological, analytical study of music literature from approximately 600-1600: Gregorian chant, Notre Dame, Burgundian, English, and Netherlands schools. *Prerequisites:* 1, 3, 11, 12, or permission, ability to read music. Three hours. Offered in alternate years.

**114 Baroque Music** Chronological, analytical study of music literature from approximately 1600-1750: Roman and Venetian schools, beginnings of opera, culminating in works of Handel and J.S. Bach. *Prerequisites:* 1, 3, 11, 12, or permission, ability to read music. Three hours. Offered in alternate years.

**115 Genre or Specific Area Courses** American music; ethnomusicology; jazz, blues, and country western. *Prerequisites:* Three hours from 1, 3, 11, 12, or permission, ability to read music. Three hours. Offered in alternate years.

### 193, 194 College Honors

**195, 196 Special Topics** *Prerequisites:* Junior or senior standing; Music 11, 12, 131, 132, 133, 134. Three hours.

**211, 212, 213, 214, 215 Seminars in Music Literature** Seminars will treat in detail topics surveyed in intermediate level music literature sequence. Subject matter determined by instructor. *Prerequisites:* 11, 12; 111 for 211, 112 for 212, 113 for 213, 114 for 214; 115 for 215. Three hours. Offered on irregular basis as required by major enrollment.

**216 Bibliography Seminar** Biographies and critical works, bibliographies, Festschriften, scholarly and performing editions of music and discography surveyed. *Prerequisites:* 11, 12, one additional music literature course at 100 or 200 level. Three hours.

**221 Senior Project** For the advanced music history student — an opportunity to work with a faculty member on a topic of mutual interest. All topics subject to departmental approval. *Prerequisites:* 11, 12, six hours of intermediate and/or advanced courses in music literature. Three hours.

## PERFORMANCE

For the fees for instruction, see page 16.

For B.A. students with a concentration in performance and B.M. students, except theory majors, a senior recital is re-

quired. See repertory lists in department office for differences in expectations for B.A. and B.M. students. Regular appearances in informal recitals are required of all performance students. At the end of each semester, jury examinations are given in performance. In the second semester of the sophomore year, all prospective performance majors are required to pass a junior-standing examination by faculty jury to determine whether they will be accepted as majors.

All music majors in any curriculum are required to pass a FUNCTIONAL PIANO FACILITY examination before certification for graduation. Music Education majors should pass this exam prior to student teaching (i.e. by the end of their third year). This will include:

- Ability to sight-read songs of the type found in a community song book.
- Ability to harmonize at sight; to improvise a simple piano accompaniment for songs requiring I, IV, and V chords and some simple modulations; to transpose the songs and harmonizations to other keys.
- Ability to sight-read fairly fluently simple accompaniments, vocal or instrumental, and simple piano compositions of the type used for school rhythmic activities.

B.A. students electing a concentration in piano must take two semesters of accompanying (171); B.M. students majoring in piano will take four semesters of accompanying (171).

Each hour of credit in performance study requires a minimum of one hour's practice per day, and credit will be given only on condition that the instruction be accompanied or preceded by a three-credit course in music and participation in ensemble, unless excused from the latter by the Chair.

**5-8 Performance Study** Group voice or piano. No prerequisites, but contact must be made in Music Department office to determine availability of space. Lab fee required if taken as elective. One hour.

**51-58 Performance Study** Private instruction in an instrument or voice for nonmajors. Subject to availability of staff. Lab fee required. Contact department office for placement. Not open for credit to music majors or minors. One hour.

**151-158 Performance Study** Private instruction in an instrument or voice for music majors and minors at the freshman and sophomore levels. Lab fee required. Variable hours.

**251-253 Performance Study** Private instruction in an instrument or voice for majors at junior and senior levels. Lab fee required. Variable hours.

**256 Performance Study** Private instruction in voice or an instrument in the semester of senior recital. Lab fee required. Variable hours.

**257 Performance Pedagogy** Methods of teaching voice, strings, woodwinds, brass, percussion, or keyboard instruments including repertoire suitable for use at various levels of ability. Significant literature of all historical periods in major field. *Prerequisites:* Senior standing in performance, consent of instructor. Three hours. (Not offered for graduate credit.)

**259 Conducting** Technique of the baton, score reading, laboratory practice. Preparation and performance of selected scores, including rehearsal procedures. Selected students may conduct University major ensembles. *Prerequisites:* 132, 134. Three hours.

## PERFORMING ENSEMBLES

**Large Ensembles** Attendance at all rehearsals and public performances is required. *Prerequisite:* Audition. One hour. May be repeated for credit.

**161 Band**

**162 Choir**

**163 Choral Union**

**164 Orchestra**

**165 Vermont Wind Ensemble**

**Small Ensembles** Study and performance of masterworks for small groups. Attendance at all rehearsals and public performances required. Outside practice required. *Prerequisite:* Audition. One hour. May be repeated for credit.

- 171 Accompanying
- 172 Brass Ensemble
- 173 Contemporary Ensemble
- 174 Madrigal Choir
- 175 Opera Workshop
- 176 Percussion Ensemble
- 177 Small Ensemble
- 178 Stage Band
- 179 Trombone Choir

**Pedagogy Classes** Primarily for Education majors; others accepted with permission from department office. One hour. May be repeated for credit.

- 81 Brass Class
- 83 String Class
- 85 Voice Class
- 87 Woodwind Class
- 89 Percussion Class

**181 Music for Elementary Teachers** Development of musical skills, understandings, and attitudes pertinent to teaching of music in elementary classroom. *Prerequisite:* Sophomore standing. Three hours.

**184 Instrument Repair** Laboratory for music education students in minor repair and adjustment of string, woodwind, brass, and percussion instruments. *Prerequisites:* String, woodwind, brass, and percussion classes or concurrent enrollment, departmental permission. One hour. Offered on occasional basis only.

**186 Piano Repair - Tuning** To acquaint students with basic knowledge of piano construction, tuning, and repairing. Departmental permission. One hour. Offered on occasional basis only.

**281 Elementary Music Education Methods** (Same as Education EDMU 281.) Three hours.

**282 Secondary Music Education Methods** Methods and materials in the teaching of vocal and instrumental music in secondary schools. Five hours classroom observation per week required. *Prerequisites:* Junior standing in Music Education. Three hours.

## Natural Resources (NR)

### SCHOOL OF NATURAL RESOURCES

*Professors Cassell, Manning, Reidel; Associate Professors DeHayes, Donnelly, Forcier, LaBar, Lindsay, Newton; Assistant Professor Fuller; Research Assistant Professor Clausen; Extension Assistant Professor Marek; Lecturers Smith, Turner, Vissering.*

**1 Ecological Aspects of Natural Resource Conservation** Introduction to renewable natural resources emphasizing the integrated and interactive nature of resources, natural history of Vermont, and the biological basis of plant and animal conservation ecology. Four hours. DeHayes.

**25 Elementary Natural Resource Measurements and Mapping** Introduction to surveying, mapping, aerial photo measurements, and interpretation for natural resource planning and management. *Prerequisites:* A course in high school or college trigonometry; permission required of non-majors. Four hours. Fuller, Turner.

**40 The American Wilderness** History, philosophy, and management of wilderness. Emphasis on evolving atti-

tudes toward wilderness and natural resources and contemporary management issues. Three hours. Manning.

**51 Environmental Aesthetics and Planning** Examines historical changes in perceptions of natural and built landscapes, the issues involved in the appearance of landscapes today, and techniques for enhancing landscape beauty. Three hours. Vissering. Alternate years, 1989-90.

**102 Water as a Natural Resource** Characteristics of watersheds, lakes, rivers, and wetlands; discussion of the management of these ecosystems; effects of society on the water resource. *Prerequisites:* Biology 1, Zoology 9 or Botany 4 or equivalent, and Chemistry 1, 3, 4, or 42 or equivalent. Three hours. LaBar.

**143 Introduction to Geographic Information Systems** Discussion and application of basic techniques involved in the use of computer-based, geographically-referenced information systems. *Prerequisites:* Sophomore standing and Computer Science 3 or 11. Three hours. Newton, Smith.

### 193 Honors

**235 Legal Aspects of Planning and Zoning** Comparison of Vermont planning and zoning law with that of other states. Case studies in planning, zoning, and land use controls. *Prerequisite:* Senior standing. Three hours.

**240 Wilderness and Wilderness Management** (See Recreation Management 240.) Three hours. Manning.

**244 Quantitative Assessments of Natural Resources** Principles associated with inventorying selected natural resources. Survey of measurement and estimation techniques for land, timber, wildlife, fisheries, surface water, and recreation. *Prerequisites:* One course in statistical methods, one 200-level natural resource course, permission of instructor. Three hours. Newton.

**254 Advanced Natural Resource Policy** (See Forestry 254.) Three hours. Reidel.

**262 International Problems in Natural Resource Management** Discussion of problems associated with the management of natural resources which have international implications. Topics may include deforestation, desertification, fisheries, wildlife, refuges, fuelwood, pollution. *Prerequisites:* Senior standing, permission. Three hours. Newton.

**270 Toxic and Hazardous Substances in Surface and Ground Water** The fate of toxic and hazardous pollutants, including trace elements and organics, in surface and ground water; effects on human health and aquatic biota. *Prerequisites:* Biology 1, Chemistry 1; senior standing. Three hours. McIntosh. (Graduate credit pending.)

**272 Environmental Impact Assessment** Comprehensive perspective on methods and problems of assessing environmental and social impacts arising from natural resource management. *Prerequisite:* Senior standing. Three hours.

**275 Natural Resources Planning: Theory and Techniques** Consideration of historical and theoretical roots of resource planning. Development of some skills mandated for natural resource planners. *Prerequisite:* Senior or graduate standing. Three hours.

**276 Water Quality Analysis and Interpretation** Selected aspects of water chemistry and bioassay as related to surface and ground waters. Laboratory analysis of water quality parameters and data interpretation. *Prerequisites:* One course in chemistry, calculus, statistics; senior standing. Three hours. Cassell. Not offered 1988-89.

**278 Water Resources Principles** Study of basic physical and chemical principles underlying the behavior of lakes, streams, and rivers. Introduction to mathematical modeling of aquatic systems. *Prerequisites:* Math. 19 and Chemistry 3 or equivalent, senior standing. Three hours. Cassell. Not offered 1988-89.

**282 Seminar in Research Planning** Discussions on the planning and activities associated with graduate projects

and research. Students prepare and present a formal study proposal. *Prerequisites:* Permission of instructor or graduate standing. One hour.

**285 Advanced Special Topics in Natural Resource Planning** Advanced special topics in natural resource planning beyond the scope of existing formal courses. *Prerequisites:* Graduate or senior standing, permission of instructor.

## Nursing (NURS)

### SCHOOL OF NURSING

*Associate Professor Dale, Interim Dean.*

*Professional Nursing: Associate Professors Brown, Deck, Emerson (Chairperson), Forgione, Hadeka, Hamel-Bissell, Palmer, B. Murray, Schwalb, A. Smith; Assistant Professor Rainville; Visiting Assistant Professors B. Johnson, L. Murray, Whitney; Lecturers Clements, M. Johnson, Laferriere; Adjunct Assistant Professor Mariak; Adjunct Instructor Owen.*

*Technical Nursing: Associate Professor Clarke (Chairperson); Assistant Professor Cohen; Visiting Assistant Professor Copeland; Instructor Schweitzer; Lecturer Palumbo; Adjunct Assistant Professors K. Smith, Stiles.*

### FOR NONMAJORS

**15 Personal Power in Health** Explores consumer power in health care. Addresses how an individual can influence personal health as well as health of community. Three hours. Hadeka, Murray.

**20 Aging: Change and Adaptation** (Same as Early Childhood and Human Development 20/Education and Sociology 20). Individual and social meanings of aging and old age; physical, physiological, psychological, and sociological changes accompanying aging; individual family, community, and societal adaptations to aging. Three hours. Brown, Cutler.

**140 Issues in Women's Health** Exploration of psychosocial, biophysical needs of women as health care consumers/providers. Considers pros and cons of stereotypical, theoretical, clinical approaches utilized in treating women. *Prerequisites:* Introductory psychology, human development, or sociology; junior standing or permission of instructor. Three hours. Hamel-Bissell.

### 195, 196 Special Topics

### PROFESSIONAL NURSING MAJOR (PRNU)

*Note: All courses limited to students majoring in Professional Nursing except by permission of departmental chairperson.*

**25 Concepts of Health** Study of psychosociocultural effects on health, health care, and the professional nursing role. Introduction to cognitive processes and communication skills used in nursing. Two hours.

**26 Introduction to Nursing Skills** Identification and application of basic nursing skills. Self-directed study, creativity and application of knowledge emphasized. Includes supervised experience in clinical setting. *Prerequisites:* Satisfactory completion (C- or better) of at least two of the following four sciences — Microbiology 55, 57, Chemistry 4, Anatomy and Physiology 19, 20. Four hours.

**125-126 Nursing I and II** Development of knowledge and skills needed to assess and maintain psychosocial, physical, and physiological integrity of individuals of all ages during health and episodes of illness. Health problems resulting from common deviations from normal physical, physiological, and psychosocial functions. Dynamics of groups (family

and peer). Laboratory experiences in different hospital settings and with families in community. *Prerequisites:* 25, 26, Chemistry 3-4, Anatomy and Physiology 19-20, Microbiology 55, 57, Early Childhood and Human Development 80-81, Psychology 1, Nutritional Sciences 141, Sociology 1 or 11. Nine hours.

**128 Nursing Implications of Drug Therapy** Study of drug influences on major body functions and the nurse's role in drug therapy. *Prerequisite:* 125 or permission of instructor. Three hours.

**195 Independent Study** Independent study in nursing as indicated by student's interest. *Prerequisite:* Departmental permission. One to three hours.

### 196 Special Topics

**225 Nursing III** Continuation and expansion of 125-126. Content and experiences organized around interrelationships of the individual, family, and community at varying levels of wellness. Focus is on more complex nursing challenges. Laboratory experiences in community agencies including the hospital. *Prerequisite:* 126, 128. Nine hours. (Not offered for graduate credit.)

**226 Nursing IV** Study and practicum focusing on knowledge and skills needed to assume role of a professional nurse. Core content includes theory on the nurse as change agent, leader, and accountable professional. Laboratory experience in leadership occurs in the same setting as 252. *Prerequisites:* 225, 251. Nine hours. (Not offered for graduate credit.)

**251 Nursing Research** Introduction to research in nursing. Each student participates in designing a study of a nursing problem. *Prerequisite:* 126. Three hours. (Not offered for graduate credit.)

**252 Nursing Elective** Practicum in a setting selected to meet student identified learning objectives. *Prerequisites:* 225, 251. Six hours. (Not offered for graduate credit.)

### TECHNICAL NURSING MAJOR (TENU)

*Note: All courses limited to students majoring in Technical Nursing except by permission of departmental chairperson.*

**15-16 Fundamentals of Nursing** Principles of nursing care. Includes assessing human functions using the nursing process to provide direct care to individuals of any age. Microbiology content integrated. Concurrent clinical experiences provided. *Prerequisites:* For 16: 15, Anatomy and Physiology 19. Six hours. Clarke, Cohen, Palumbo, K. Smith.

**123-124 Nursing Care of Children and Adults** Focuses on using the nursing process to identify alterations in normal human functions to arrive at nursing diagnosis. Concurrent clinical experiences in hospital setting provided. *Prerequisites:* 15-16, Anatomy and Physiology 19-20, Nutritional Sciences 46, Early Childhood and Human Development 80-81, English 1. Ten hours. Copeland, Schweitzer.

**130 Nursing Seminar** Focuses on issues in nursing and the role of the associate degree nurse within the profession of nursing. *Prerequisite:* 123. Two hours. Clarke.

**195 Independent Study** Independent study in nursing as indicated by student's interest. *Prerequisite:* Departmental permission. One to two hours.

## Nutritional Sciences (NUSC)

### COLLEGE OF AGRICULTURE AND LIFE SCIENCES

*Professor Carew; Associate Professors Livak, Pintau, Ross, Schlenker (Chairperson), Tyzbir; Assistant Professor Soule; Extension Assistant Professors Bartel, Wright; Lecturer Kanfer.*

**37 Basic Concepts of Foods (2-3)** Introduction to study of food which includes physical and nutritional proper-



ties as well as basic principles of food preparation. Laboratory application. Three hours. Soule. Spring.

**43 Fundamentals of Nutrition (3-0)** Comprehensive study of specific nutrients in terms of their availability, function, and utilization in mammalian species. *Prerequisites:* High school chemistry and biology. Three hours. Carew.

**44 Survey of the Field: Nutritional Sciences (1-0)** Introduction to the professional field and career opportunities in human nutrition and foods. Required of all freshmen and transfers. One hour. Soule. Fall.

**46 Introduction to Human Nutrition (3-0)** Introduction to the nutrients; nutritional implications in growth, development, and performance throughout the life cycle and in major health problems. Credit not given for both 43 and 46. Three hours. Ross. Fall.

**130 Food and the Consumer (2-3)** Investigation of factors which influence food intake. Decisions in food selection as affected by skill, time, energy, and money. *Prerequisites:* 37, a college course in nutrition. Three hours. Soule. Fall.

**133 Politics of Food (3-0)** Investigation of policies affecting current food systems and their influence on nutrition, cost, and quality of food. *Prerequisite:* Three hours in nutrition. Three hours. Livak. Fall.

**135 Fundamentals of Food Science (4-0)** Study of scientific principles involving chemical and physical properties of food and the changes that occur in food preparation and processing. *Prerequisites:* 37, three hours in nutrition, organic chemistry. Four hours. Pintauro. Spring.

**138 Quantity Food Production and Service (3-4)** Principles and techniques of food accounting, recipe and menu planning/costing, preparation and service including equipment, sanitation, and time motion studies. Will include field trips and studies of the techniques of different types of food service establishments. *Prerequisite:* 130. Four hours.

**141 Nutrition and Health (3-0)** Study of nutrient functions, needs and sources, and alterations which occur throughout the life cycle. Practice in recording and evaluating individual dietary intakes. Credit not given for both 43 and 141. *Prerequisites:* Chemistry 4 or 42, Anatomy and Physiology 19. Three hours. Ross. Spring.

**144 Applied Normal Nutrition (3-0)** Nutritional needs of individuals during the life cycle. Physiological and environmental factors which affect nutritional status. Designed for nutrition majors. *Prerequisites:* 43 or 46; organic chemistry, physiology. Three hours. Livak. Fall.

**195 Special Topics** Lectures, laboratories, readings, or projects relating to contemporary areas of study. Enrollment may be more than once, maximum of 12 hours in 195 and 295 combined. *Prerequisite:* Departmental permission.

**196 Field Experience** Professionally-oriented field experience under joint supervision by faculty and business or community representative. Hours arranged, maximum of 15 hours in 196 and 296 combined. *Prerequisite:* Departmental permission.

**235 Recent Advances in Foods and Nutrition** Interpretation and application of particular topics and trends in foods and nutrition as evidenced through literature and research. May be taken more than once for a maximum of nine hours. *Prerequisites:* 43, junior standing, chemistry, physiology, permission of instructor. Three hours.

**236 Introduction to Food and Nutrition Research (1-6)** Introduction to laboratory techniques in food and nutritional sciences. *Prerequisites:* 135, a course in biochemistry with laboratory. Three hours. Pintauro. Alternate years, spring 1989.

**237 Government Regulation of Foods (3-0)** Examination of the scope, applicability, and limitations of U.S. food laws, and the roles of U.S. food regulatory agencies. *Prerequisites:* 135, junior standing or permission. Three hours. Pintauro. Alternate years, fall 1989.

**238 Food Service Systems Management (3-0)** Organization and administration of food service systems including principles of production, accounting management decisions, communications, and legal responsibilities specific to quantity food production. Emphasis on problem solving. *Prerequisites:* Business Administration 120; 138 or permission. Three hours. Fall.

**240 Methods in Nutrition Education (2-2)** Observation, needs assessment, planning, and presenting of appropriate methods and materials for an identified audience in a community, school, or institutional setting. *Prerequisites:* 130, a college course in nutrition, permission based upon an interview. Three hours. Soule. Spring.

**241 Nutrition and Aging (3-0)** Study of physiologic, psychologic, sociologic, and economic factors which influence nutrient requirements, nutritional status, and food habits of older people. *Prerequisite:* 144. Three hours. Schlenker.

**242 Advanced Nutrition (3-0)** Study of nutrients and their specific functions in metabolic process integrating cellular physiology, biochemistry, and nutrition. *Prerequisites:* 43 or equivalent, a course in biochemistry and physiology. Three hours. Tyzbir. Spring.

**245 Nutritional Biochemistry (3-0)** Comprehensive study of metabolism of carbohydrates, lipids, and protein emphasizing hormonal control, nutritional and metabolic interrelationships, and dietary abnormalities (e.g. starvation and obesity). *Prerequisites:* 242, permission of instructor. Three hours. Tyzbir. Fall.

**246 Diet Therapy (4-0)** Adaptations of the normal diet in conditions of health and disease including the physiological and psychosociological implications. *Prerequisites:* 130, 144, 242. Four hours. Ross, Fall.

**247 Clinical Nutrition (2-3)** Applications of therapeutic nutrition including health care facility experience. Case studies, role playing, client nutritional assessment and counseling. *Prerequisite:* 246. Three hours. Spring.

**248 Nutrition Counseling in the Community (3-0)** Focus on nutrition counseling in the community as related to holistic health and disease prevention. *Prerequisites:* 144 and/or 246; physiology; biochemistry; permission. Three hours. Livak. Spring. (Not offered for graduate credit.)

**249 Nutrition Seminar (1-0)** Review of recent developments in nutrition research. *Prerequisites:* 242, permission of instructor. One hour. Schlenker.

**250 Food Safety (3-0)** Chemistry and biochemistry of food toxicants, the toxicological implications of the ingestion of food substances, and methods employed to evaluate the toxicity of these substances. *Prerequisite:* Agricultural Biochemistry 201 or permission. Three hours. Pintauro. Alternate years, fall 1988.

**290 Introduction to Research (2-0)** Research procedures with lectures and discussions of problem selection, objectives, bibliographical techniques, and analysis of data. *Prerequisite:* Departmental permission. Two hours. Alternate years, spring 1988. Ross.

**295 Special Topics** Lectures, laboratories, readings, or projects relating to contemporary areas of study. Enrollment may be more than once, maximum of 12 hours in 195 and 295 combined. *Prerequisite:* Departmental permission.

**296 Field Experience** Professionally-oriented field experience under joint supervision of faculty and business or community representative. Hours arranged; maximum up to 15 hours in 196 and 296 combined. *Prerequisite:* Departmental permission.

## Pathology (PATH)

COLLEGE OF MEDICINE

*Professors Clemmons, Craighead (Chairperson), Howard, Kor-*

son, Stark, Trainer, Winn; Associate Professors Bovill, Hardin, Lee, MacPherson, J. B. McQuillen, Mossman, Tindle; Assistant Professors Christadoss, Heintz, Huber, Krawisz, Leslie, Lunde, Pendlebury, Sharp, Tracy, Van Houten, Waters.

**101 Introduction to Human Disease (2-3)** Elementary course in human pathology designed for Allied Health students. First portion deals with general mechanisms of disease, followed by disorders of specific organs. *Prerequisites:* One year college level general biology or equivalent, permission of departmental chairperson. Three hours.

**305 Pathobiology** Basic introductory course in pathological mechanisms for graduate and postdoctoral students who are not candidates for M.D. degree, advanced medical students, pathology residents, and undergraduates by permission of course coordinator. Alternate years. Three hours.

## Pharmacology (PHRM)

### COLLEGE OF MEDICINE

*Professors J. Bevan (Chairperson), R. Bevan, Jaffe, McCormack, Tritton; Associate Professors Hacker, Reit, Robbins, Stewart; Assistant Professors Brayden, Nelson, Scollins, Shreeve; Research Assistant Professors Bigelow, Borman, Laher; Visiting Professor Maxwell, Standen.*

**190 Pharmacology for Physical Therapy** Basic pharmacology and classes of drugs which may alter the responsiveness of patients to physical therapy. Last six weeks of second semester. Two hours.

**272 Toxicology** The biology of environmental intoxicants and of drug abuse. Ecologic and physiologic consequences of the dissemination of agricultural, industrial, and medicinal chemicals. *Prerequisites:* Organic chemistry, background in biology. Three hours.

**290 Introduction to Pharmacology** Consideration of factors which determine the efficacy and safety of drugs emphasizing representative agents used in medicine. *Prerequisites:* Introductory course in organic chemistry, background in physiology or health sciences. Three hours.

**302, 303 Pharmacological Techniques** Experiments conducted under supervision in the areas of drug metabolism, modes of drug action, physicochemical properties of drugs, bioassay, and toxicology. Open to undergraduates with permission of instructor. Two hours, by arrangement.

**328 Introduction to Medicinal Chemistry** Important classes of drugs are surveyed. Emphasis on relationships between physicochemical properties and pharmacologic activity; synthetic aspects considered. *Prerequisites:* Chemistry 131-132. Open to undergraduates with permission of instructor. Three hours. McCormack.

## Philosophy (PHIL)

### COLLEGE OF ARTS AND SCIENCES

*Professors Hall, Hansen, Mann (Chairperson), Sher; Associate Professor Guignon, Kornblith, Kuffik; Assistant Professors Christensen, Miller, Pereboom.*

*Indications about the frequencies with which courses are offered are in some cases only estimates. Students should consult the department for further information.*

**1 Introduction to the Problems of Philosophy\*** In-

roduction to philosophy through such fundamental problems as the existence of God, the basis of morality, and the possibility of knowledge. Contemporary and historical readings. Three hours. Offered every semester. Guignon, Hall, Kornblith, Miller, Pereboom, Sher.

**3 Comparative East-West Philosophy\*** Introduction to the historical dialectic of philosophy by comparisons and contrasts between Chinese and Western traditions of philosophy. Three hours. Offered every semester. Hansen.

\*Credit will not be given for both 1 and 3.

**4 Introduction to Ethics** Analysis of the principal problems and theories of ethics. Three hours. Hall, Kuffik.

**13 Introduction to Logic** Study of the basic principles of deductive inference. Three hours. Christensen, Kornblith, Mann.

**101 History of Ancient Philosophy** Study of the works of the Pre-Socratics, Plato, Aristotle, and their successors. *Prerequisite:* 1, 3, or 4. Three hours. Offered every fall semester. Hall, Mann.

**102 History of Modern Philosophy** Study of works of the major philosophers of the 17th and 18th centuries: Descartes, Spinoza, Leibniz, Locke, Berkeley, Hume, Kant, and others. *Prerequisite:* 1, 3, or 4. Three hours. Offered spring semester. Pereboom, Sher.

**105 History of Medieval Philosophy** Study of works of such major philosophical figures as Augustine, Anselm, Abelard, Aquinas, Duns Scotus, and William of Ockham. *Prerequisite:* 101 is recommended. Three hours. Alternate years. Mann.

**107 19th Century Philosophy** Study of works of such philosophers as Hegel, Fichte, Schopenhauer, J. S. Mill, Kierkegaard, Nietzsche, and Marx. *Prerequisite:* 102 is recommended. Three hours. Alternate years. Hall.

**110 Nature of Mind** Examination of philosophical issues raised by influential psychological views of the nature of the human mind. *Prerequisite:* 1, 3, or 4 or one course in psychology. Three hours. Offered every fall semester. Kornblith, Pereboom.

**112 Introduction to the Philosophy of Science** Introduction to major philosophical problems raised by science. Typical topics: the nature of scientific inference, the structure of theories, causation, explanation, and scientific change. *Prerequisite:* One course in philosophy or one course in history of science or six hours in any natural science. Three hours. Offered every fall semester. Christensen.

**113 Intermediate Logic** Study of the basic results about logical systems, including axiomatic treatments of sentential calculus and first-order logic, independence, consistency, soundness, completeness, and the Lowenheim-Skolem theorem. *Prerequisite:* 13. Three hours. Alternate years. Christensen, Mann.

**121 Chinese Philosophy I** Study of the Classical Schools of Chinese thought, including Confucianism, Taoism, Mohism, and Legalism. *Prerequisite:* One course in philosophy, religion, or Asian studies. Three hours. Offered two out of every three semesters. Hansen.

**122 Chinese Philosophy II** Chinese thought from the Han Dynasty to Mao Zedong's thought. *Prerequisite:* 121. Three hours. Alternate years. Hansen.

**130 Philosophical Foundations of Education** Critical examination of the aims of education and the most appropriate means of achieving those aims. Readings from historical and contemporary sources. *Prerequisite:* 1, 3, or 4. Three hours. Alternate years. Miller.

**133 Marxism** Survey of the philosophy of Karl Marx and the Marxist tradition on such topics as historical materialism, human nature, alienation, freedom, social change, and revolution. *Prerequisites:* 1, 3, or 4. Three hours. Miller. Alternate years.

**135 Philosophy of Religion** Typical topics: the nature of religion, the concept of God, the grounds for belief in God, mortality, truth, and revelation. Historical and contemporary sources. *Prerequisite:* 1, 3, or 4. Three hours. Offered once a year. Hall, Mann.

**140 Social and Political Philosophy** Analysis of such fundamental theories and problems in social and political thought as political obligation, rights, and justice. *Prerequisite:* 1, 3, or 4. Three hours. Offered once every year. Hall, Kuflik, Sher.

**142 Philosophy of Law I** (Same as Political Science 123.) Analysis of the nature of law, the relation between law and morality, obligation to obey the law, the judicial decision, responsibility in law, legal ethics. *Prerequisite:* 1, 3, or 4 or Political Science 31. Three hours. Offered once a year. Hall, Hansen, Kuflik; Wertheimer (Political Science).

**143 Philosophy of Law II** (Same as Political Science 124.) Problems of liberty, e.g. freedom of expression, privacy, paternalism; scope and limits of the criminal law; philosophy of punishment; selected problems in criminal justice, e.g. plea bargaining; preventive detention. *Prerequisite:* 1, 3, or 4 or Political Science 31. Three hours. Offered once a year. Hansen, Kuflik; Wertheimer (Political Science).

**144 Philosophical Problems in Medicine** Critical and intensive examination of such problems as abortion, euthanasia, dying and death, the ethics of organ transplantation, and the ethics of genetic engineering. *Prerequisite:* 1, 3, or 4. Three hours. Offered once a year. Kuflik, Sher.

**151 Philosophical Ideas in Literature** Philosophical themes as exemplified in literature. *Prerequisite:* 1, 3, or 4. Three hours. Alternate years. Guignon, Hall.

**152 Philosophy of Art** A consideration of some leading theories of art, and their application to problems of art as they appear in music, literature, painting, and in the general criticism of the arts. *Prerequisite:* 1, 3, or 4. Three hours. Offered once a year. Hall.

**160 Recent Continental Philosophy** Survey of 20th century continental philosophy, including phenomenology, hermeneutics, critical theory, structuralism, and poststructuralism. Readings from Husserl, Heidegger, Sartre, Saussure, Wittgenstein, Habermas, and Foucault. *Prerequisites:* 1, 3, or 4, or consent of instructor. Three hours. Guignon.

### 193, 194 College Honors

**195, 196 Intermediate Special Topics** Intermediate courses or seminars on topics beyond the scope of existing departmental offerings. See Schedule of Courses for specific titles.

### 197, 198 Readings and Research

**201 Theory of Knowledge** Critical examination of nature and sources of knowledge; belief, truth, evidence, perception, memory, and induction. *Prerequisite:* 102 or 112. Three hours. Offered every fall semester. Kornblith, Sher.

**202 Metaphysics** Critical examination of such topics as the nature of space and time, the concept of change, the identity of the self, the nature of the world and man's place in it. *Prerequisites:* 101, 102 or 110. Three hours. Offered every spring semester. Kornblith, Mann, Sher.

**210 Philosophy of Mind** Major philosophical theories of the mind and its relation to the physical world, the nature of sensation, desire, and belief, and the relation between thought and action. *Prerequisite:* 102 or 110. Three hours. Alternate years. Kornblith, Pereboom.

**212 Philosophy of Science** A thorough investigation of one or two problems in the philosophy of science. Emphasis on modern attempts to solve them. *Prerequisite:* 112 or any 100-level history of science course or junior or senior standing in a science major. Three hours. Offered every other spring semester. Christensen.

**217 Philosophy of Language** Philosophical study of the nature of language. *Prerequisite:* 113 or Linguistics 101,

102. Three hours. Alternate years. Christensen, Hansen, Kornblith.

**221 Topics in Chinese Philosophy** Detailed examination of a classical Chinese philosophical text or school. *Prerequisite:* 121 or 122. Three hours. Alternate years. Hansen.

**240 Contemporary Ethical Theory** Analysis of the ideas of contemporary moral philosophers in normative ethics and metaethics. *Prerequisite:* 140, 142, 143, or 144. Three hours. Alternate years. Kuflik, Sher.

**241 Contemporary Social and Political Philosophy** An analysis of the ideas of contemporary philosophers in social and political philosophy. *Prerequisite:* 140, 142, 143, or 144. Three hours. Alternate years. Kuflik, Sher.

**242 Justice and Equality** (Same as Political Science 213.) An examination of contemporary normative theories of distributive justice and quality. *Prerequisite:* 140, 142, 143, or 144. Three hours. Offered once a year. Kuflik, Sher; Wertheimer (Political Science).

**260 Topics in Continental Philosophy** Study of a central issue in current continental philosophy, e.g. social theory, psychoanalysis, or aesthetics. Readings from Nietzsche, Heidegger, Gadamer, Ricoeur, Habermas, Derrida, and Foucault. *Prerequisites:* 107, 160, or consent of instructor. Three hours. (May be repeated for credit when topic is significantly different.) Guignon. Alternate years.

**262 Existentialism** Study of existentialism as a philosophy, and an examination of its background, as displayed in the literary and philosophical writing of Pascal, Kierkegaard, Camus, Heidegger, and Sartre. *Prerequisites:* Any two of 101, 102, 107. Three hours. Alternate years. Guignon, Hall.

**265 American Philosophy** The thought of such leading American philosophers as Peirce, James, Royce, Santayana, Dewey, and Whitehead. *Prerequisites:* 101, 102. Three hours. Alternate years. Miller.

**271, 272 Seminar: Major Philosophical Author or School** Study of major philosophical texts by a single author or school of thought. May be repeated for credit when different authors are studied. *Prerequisite:* An appropriate 100-level course in philosophy. Three hours. Offered once a year.

**295, 296 Advanced Special Topics** Advanced courses or seminars on topics beyond the scope of existing departmental offerings. See Schedule of Courses for specific titles.

**297, 298 Readings and Research** Independent study with an instructor on a specific philosopher or philosophical problem. *Prerequisite:* An appropriate 200-level course in philosophy.

## Physical Therapy (PT)

### SCHOOL OF ALLIED HEALTH SCIENCES

*Professor Feitelberg (Chairperson); Associate Professors Held Moffroid, Reed; Assistant Professors Emery, Zimny; Clinical Assistant Professors Nalette, Nelson, O'Rourke; Clinical Instructor Tandy.*

**41 Introduction to Physical Therapy Profession** Introduction to PT profession. Aspects of practice management skills; the medical, ethical, and legal aspects of practice. Clinical assignments provide opportunity for observation of concepts in practice. Three hours. Emery, Feitelberg, Henry, Kaufman.

**110 Kinesiology** Study of normal posture and movement. Principles of anatomy, biomechanics, and neurophysiology are studied in relation to static and dynamic components of motion. *Prerequisite:* Anatomy and Neurobiology 201, Mechanical Engineering 93. Three hours. Moffroid, Zimny.

**120 Musculo-Skeletal Bases for Practice of Physical**

**Therapy** Principles of structure and function of the musculo-skeletal system related to static and dynamic elements of movement. Practice of basic tests and measurements used by physical therapists to identify abnormalities of musculo-skeletal system. *Prerequisites:* Anatomy and Neurobiology 201, Mechanical Engineering 93. Six hours. Henry, Moffroid, Zimny.

**121 Musculoskeletal Evaluation and Management Procedures** Advanced principles and methods of Physical Therapy evaluation and management as they relate to patients with musculoskeletal dysfunction. *Prerequisites:* Junior standing in PT, 120, Anatomy and Neurobiology 201. Three hours. Currier, Henry, Zimny.

**122 Sensory-Motor Development** Sensory-motor provisions for posture and movement at all ages, including neuro-anatomical substrates, simple reflex patterns, and complex motor sequences of movement. Basic physiological changes throughout the life cycle. *Prerequisites:* Junior standing in PT, Anatomy and Neurobiology 202. Three hours. Feitelberg, Kelley.

**124 Modalities** Theory and application of physical agents including heat, cold, light, water, sound, electricity, massage, traction, pneumatic pressure, and biofeedback. Selected clinical topic areas. *Prerequisites:* Junior standing in PT, Mechanical Engineering 93, Electrical Engineering 94, Physiology and Biophysics 101-102. Five hours. Reed.

**126 Performance Physiology** Cellular and systemic aspects of the physiology of exercise applied to the theory and practice of physical therapy. *Prerequisites:* Junior standing in PT; Physiology and Biophysics 101-102. Two hours. Reed, Fillyaw.

**127 Neurophysiological Bases and Practice of Physical Therapy** Advanced concepts in the neurophysiological basis of normal and abnormal movement control as a context for therapeutic intervention in neurologically impaired individuals. *Prerequisites:* Senior standing in PT, Anatomy and Neurobiology 202. Five hours. Held, O'Rourke.

**131-132-133 Clinical Medicine I-III** Management of disease processes in the medical specialties such as General Medicine, Orthopaedics, Neurology, and Pediatrics. Lecture and clinical presentations. I: one hour; II: one hour; III: two hours.

**143 Communications in the Health Care Setting** Development of the written and verbal skills of professional communication emphasizing legal and ethical ramifications. Designed to prepare students to fulfill communication responsibilities of clinical practice. *Prerequisite:* 41. One hour. Emery, Nelson.

**144 Health Care Systems** An overview of health care in the U.S. emphasizing the social, economic, regulatory, and political systems as they affect the practice of physical therapy. *Prerequisite:* 41, 143. Two hours. Feitelberg.

**145 Educational Methodology for Physical Therapy Practice** Introduction to learning theory and methods as they apply to the various teaching roles of the physical therapist. *Prerequisites:* Senior standing in PT, 41, 143, 144. Two hours. Emery, Nalette.

**146 Administration and Organization in Physical Therapy** Methods of health care administration and management as applied to the practice of physical therapy. Analysis and discussion related to societal forces influencing the administration of physical therapy services. *Prerequisites:* Senior standing in PT, 145. Two hours. Emery, Nalette.

**156-158 Clinical Education I-II** Students assigned to approved clinical centers throughout the U.S. but focused in the northeast. Students begin with supervised observation and progress to fully participate in evaluation and treatment of patients. Learning experiences are designed to meet objectives of University and clinical facility for clinical competency. (Three full-time, six-week periods; May-June or July-August of junior

year, and January-March of senior year.) I: three hours; II: six hours. *Prerequisite:* Satisfactory completion of all departmental courses. Emery, O'Rourke.

**175 Independent Study** Selection and development of topic for investigation using assigned faculty member as preceptor. Seminar sessions for guidance and problem solving on related issues. Two hours. Emery, Feitelberg, Held, Moffroid, O'Rourke, Reed, Zimny.

**176 Scientific Inquiry** Clinical inquiry presented as a methodology. Student defines problem, reviews literature, designs study, and identifies appropriate statistical tools for analysis. Plans for clinical inquiry and methods of dissemination of information are explored. *Prerequisite:* A statistics course. Three hours. Held.

## Physics (PHYS)

### COLLEGE OF ARTS AND SCIENCES

*Professors Arns, Brown, Detenbeck, Lambert, Nyborg, Scarfone, Smith (Chairperson); Associate Professors Rankin, Sachs, Spantalian.*

**1 Celestial Physics** Description of various historical models of the observable universe. Nature of light and description of optical instruments, especially the telescope. Concept of space and time, Einstein's Relativity. Three hours.

**2a, b, c Topics in Physical Science** A sequence of three four-week mini-courses offered for one credit each on topics announced in advance. Students may enroll for from one to three credits. Limited use of algebra and geometry.

**3, 4 Optical Holography** First semester: Basic theory, equipment, and production of simple holograms. Second semester: Theory and production of complex holograms; nondestructive testing. *Prerequisites:* 3 for 4, instructor's permission. Three hours.

**5 Introductory Astronomy** Survey of astronomy and astrophysics from broad scientific and cultural perspective. Stellar and galactic astronomy. Limited use of algebra and geometry. Three hours.

**6 Introductory Astronomy** Survey of astronomy and astrophysics from broad scientific and cultural perspective. Planetary and extragalactic astronomy, relativity, and cosmology. Limited use of algebra and geometry. Three hours.

**11, 12 Elementary Physics (3-0)** Survey of principles of classical and modern physics without calculus, appropriate for students concentrating in life or health sciences. Accompanying labs: Physics 21, 22. *Prerequisites:* 11 or 31 for 12; secondary school algebra and trigonometry. Three hours.

**21 Introductory Laboratory I (1-2)** *Prerequisite:* Concurrent enrollment or credit in 11 or 31. One hour.

**22 Introductory Laboratory II (1-2)** *Prerequisite:* Concurrent enrollment or credit in 12 or 42. One hour.

**31 Introductory Physics (3-0)** Mechanics, thermodynamics, waves. Recommended for students of engineering, natural sciences, premedical programs. Accompanying lab: 21. *Prerequisites:* Math. 20 or 21, secondary school trigonometry. Three hours.

**42 Electromagnetism and Modern Physics (3-0)** Electricity, magnetism, optics, modern physics. Recommended for students in natural sciences, premedical programs. Credit not allowed for both 42 and 125. Accompanying lab: 22. *Prerequisite:* 31. Three hours.

**121 Biological Physics (3-2)** Physical laws, concepts, and methods discussed with respect to their reference to biology. *Prerequisites:* 12 or 42, Chemistry 2, Math. 22. Three hours.

**125 Electromagnetism and Optics (3-2)** Electricity, magnetism, electromagnetic waves, optics. With lab. Recommended for students of engineering, physical sciences. Credit not allowed for both 42 and 125. *Prerequisites:* 31; Math. 22, concurrent enrollment in Math. 121. Four hours.

**128 Introductory Modern Physics (3-2)** Introduction to theory of relativity and to modern descriptions of radiation, the electron, the atom, the atomic nucleus, and elementary particles. *Prerequisites:* 42 or 125, Math. 121. Four hours.

**170 Geophysics (3-0)** Structure of the solid earth, using seismic, magnetic, and gravitational methods. *Prerequisites:* Six hours calculus, six hours physics. Three hours. Alternate years, spring 1989.

### 193, 194 College Honors

**195, 196 Intermediate Special Topics** Intermediate courses or seminars on topics beyond the scope of existing departmental offerings. See Schedule of Courses for specific titles.

### 197, 198 Readings and Research

**201, 202 Experimental Physics (1-3)** Experiments in classical and modern physics. May be entered at beginning of either semester and repeated for credit up to a maximum of four semesters. *Prerequisites:* 42 or 128, Math. 121, junior standing. Three hours.

**211 Mechanics** Newtonian dynamics of particles and systems of particles, with applications to problems of special importance, such as driven and coupled harmonic oscillators and central field trajectories. *Prerequisites:* 42 or 125, Math. 121. Three hours.

**213 Electricity and Magnetism** Fundamental principles of electricity and magnetism; electrostatic fields, and magnetic fields of steady currents. Electric and magnetic properties of matter and electromagnetic energy. *Prerequisites:* 42 or 125, Math. 121. Three hours.

**214 Electromagnetism** Introduction to time dependent electromagnetic fields. Maxwell's equations in vacuum and in matter. Electromagnetic waves and radiation. *Prerequisite:* 213. Three hours. Alternate years, spring 1990.

**222 Advanced Biological Physics (3-2)** Sound and electromagnetic waves; ionizing particles and radiation. Interaction of these physical agents with biological systems. Physical properties of macromolecules and their aggregates. *Prerequisites:* Chemistry 2, Math. 121, experience in applying differential equations, departmental permission. Four hours.

**242 Introduction to Solid State Physics** Introduction to crystal structures, reciprocal lattices, lattice vibrations. Thermal properties of solids and free electron theory of metals and semiconductors. Elementary band theory and introduction to electronic transport theory. *Prerequisite:* 128. Three hours. Alternate years, spring 1989.

**254 Atomic and Nuclear Physics** Phenomenological study of electronic structure of atoms. Structure of the nucleus and properties of nucleons. *Prerequisite:* 128. Three hours. Alternate years, fall 1989.

**255 Physical Optics** Introduction to physical optics including polarization, birefringence, dichroism, scattering, and diffraction of light. Fourier transform analysis of optical images. *Prerequisites:* 125 or 42, 213, Math. 121. Three hours. Lambert, Smith. Alternate years, spring 1989.

**257 Modern Astrophysics** Stellar structure and evolution, compact objects, the interstellar medium, galactic structure, gravitational theory, and cosmology, the formation of our solar system and terrestrial life. *Prerequisites:* One 100-level course in physical science or engineering. Three hours. Rankin. Alternate years, fall 1988.

**258 Relativity** Development of Einstein's theory of special relativity. Lorentz transformation, time dilation, length contraction, mass variation, relative velocities. Introduction to four-dimensional space. Concepts of general relativity. Applications selected from astrophysics, elementary particles, etc.

*Prerequisite:* 128. Three hours. Alternate years, spring 1990.

**264 Introduction to Elementary Particles** Theoretical and experimental aspects of elementary particles including their properties, classification schemes, symmetries, conservation laws, fundamental interactions, models of particle structure, and special topics as time allows. *Prerequisites:* 128, 213. Three hours.

**265 Thermal Physics** Thermodynamics, kinetic theory, statistical mechanics. *Prerequisites:* 128 or 42; Math. 121. Alternate years, spring 1989.

**273 Quantum Mechanics I** Introduction to nonrelativistic quantum mechanics. Schrodinger equation and applications to simple systems. *Prerequisites:* 128, 211. Three hours.

**295, 296 Advanced Special Topics** Advanced courses or seminars on topics beyond the scope of existing departmental offerings. See Schedule of Courses for specific titles.

## Physiology and Biophysics (PSLB)

### COLLEGE OF MEDICINE

*Professors Alpert (Chairman), Gibbons, Hendley, Low, McCrorey; Associate Professors Evans, Halpern, Hamrell, Pattak, Webb; Assistant Professor Warshaw. Research Associate Professors Maughan, Mulieri, Stirewalt; Research Assistant Professors Mitchell, Periasamy, Woodcock-Mitchell.*

**19-20 Undergraduate Human Anatomy and Physiology** A two-semester course with credit given only upon completion of both semesters. Structure and function of human body emphasizing properties of cells, organ systems, and their interrelationships in health and disease. Topographic anatomy using cadaver prosections, radiographs, microscope slides. Histophysiologic correlations of body systems. Required for two-year Allied Health students, two- and four-year Nursing students, and open to other University undergraduate students. *Prerequisite:* 19 for 20. Four hours per semester. Parsons, McCrorey.

**101-102 Physiology and Biophysics (3-3)** A comprehensive, in-depth presentation of human function on a scientific basis. Primarily for Physical Therapy students; a limited number of others may be admitted with permission. *Prerequisites or concurrent:* Chemistry 3 and 42 or equivalent, two semesters general physics, one semester mathematics, permission. Four hours per semester.

**191, 192 Undergraduate Research** Individual laboratory research under guidance of faculty member. *Prerequisite:* Departmental permission. Three or six hours.

## Plant and Soil Science (PSS)

### COLLEGE OF AGRICULTURE AND LIFE SCIENCES

*Professors Bartlett, Boyce, MacCollom, Magdoff (Chairperson), Murphy; Extension Professor Bouton; Extension Associate Professors Costante, Gottlieb; Extension Assistant Professors Berkett, Jokela, Nielsen, Perry; Lecturer Margolis.*

**7 Orientation to Community Forestry and Horticulture** Role of plants in the urban environment; survey of professions and career planning in Community Forestry and Horticulture. One hour. Donnelly, Pellett.

**10 Home and Garden Horticulture** Planning, selecting, and maintaining shrubs, trees, flowers, lawns, fruits, and

vegetables around the home. Designed primarily for nonagricultural students. Course does not meet distribution requirements for P&SS majors. Three hours. Margolis.

**11 Principles of Plant Science** Principles and practices involved in the culture, management, and utilization of economically important horticultural and agronomic crops. Three hours. Boyce.

**106 Insect Pest Management (3-2)** Survey of the major insect orders, and methods for controlling injurious species. *Prerequisite:* 11. Four hours. MacCollom.

**107 Forest Entomology (2-2)** Ecology and population dynamics of insects affecting forests and forest products. Insect control by silvicultural, biotic, and chemical means. *Prerequisite:* Junior standing in Forestry. Three hours. Parker.

**122 Small Fruit Crops (2-2)** Principles of small fruit production, including propagation, culture, management, and harvesting. *Prerequisite:* 11. Three hours. Boyce.

**124 Vegetable Crops (2-2)** Principles and practices of commercial vegetable production, including seed production, tillage, cultural practices, nutrition value, storage, and processing. *Prerequisite:* 11. Three hours. Bouton.

**125 Woody Ornamentals (3-3)** Identification, climatic requirements, cultural management, and use of ornamental plant materials in landscape planting. *Prerequisite:* 11 or Botany 4. Four hours. Pellett.

**127 Greenhouse Management (2-3)** Commercial and professional greenhouse management, greenhouse structures, heating, ventilating, circulation, managing the greenhouse environment, and cultural practices for plant and growth. *Prerequisite:* 138. Three hours. Pellett. Alternate years, 1989-90.

**131 Landscape Design I (2-3)** A studio course emphasizing theory of landscape design and its application to actual landscape design problems. Graphic communication techniques included. *Prerequisite:* 11. Three hours.

**132 Landscape Design II (2-3)** Advanced techniques in landscape design. Grading, construction details, graphic techniques, site analysis as well as various design problems. *Prerequisites:* 125, 132, or Recreation Management 138. Three hours.

**138 Commercial Plant Propagation (3-2)** Principles and practices involved in propagating herbaceous and woody plants by seeds, division, layering, cuttings, budding, grafting, and aseptic culture. *Prerequisite:* 11. Four hours. Pellett.

**141 Forage Crops (2-3)** Identification, establishment, and management of crops grown for hay, pasture, and silage. *Prerequisite:* 11. Three hours. Murphy.

**144 Field Crops** Principles and practices essential to the establishment of field crops grown for food, feed, and fiber. *Prerequisite:* 11. Three hours. Alternate years, 1989-90.

**145 Turfgrasses (2-3)** Establishment, maintenance, and utilization of turf for lawns, parks, athletic fields, airports, cemeteries, roadsides, golf courses, and ski slopes. *Prerequisite:* 11 or Botany 4. Three hours. Alternate years, 1988-89.

**161 Introductory Soil Science (3-3)** Introductory study of the nature and properties of soils and how they serve as media for plant growth. *Prerequisite:* One semester of chemistry. Four hours. Magdoff.

**162 Soil Fertility and Management** Principles of soil management including soil testing methods and interpretations, fertilizer manufacture, usage, and management practices. *Prerequisite:* 161. Three hours. Jokela.

**197 Undergraduate Special Topics** Lectures, laboratories, readings, field projects, surveys, or research designed to provide specialized experience in horticulture, agronomy, soils, or plant environment. *Prerequisite:* Permission. One to three hours; up to 15 hours may be arranged through department chairperson for approved off-campus project.

**205 Mineral Nutrition of Plants** (See Botany 205.) Alternate years, 1988-89.

**207 Water Relations of Plants** (See Forestry 229.) Three hours. Donnelly and Botany and Plant and Soil Science staff. Alternate years, 1988-89.

**210 Soil Erosion and Conservation (2-4)** General hydrologic processes involved in surface runoff and resultant soil erosion land management techniques for controlling soil and sediment pollution. Two field trips by arrangement. *Prerequisites:* 161, Math. 2 or 9, Chemistry 3. Three hours. Jokela. Alternate years, 1988-89.

**211 Herbaceous and Indoor Plants.** Identification, growth habit, use, care, environmental tolerances, and problems of outdoor herbaceous plants and indoor flowering and foliage plants. Considered from professional viewpoint. *Prerequisite:* 11 or Botany 4 and 138 or permission. Three hours. Pellett. Alternate years, 1989-90.

**215 Weed/Crop Ecology** Weed identification, reproduction, ecological relationships with crops, and integrated management. *Prerequisite:* 11, 161. Three hours. Murphy. Alternate years, 1988-89.

**217 Pasture Production and Management** Physiological and ecological relationships of pasture plants, effects of grazing livestock on them; grazing management effects on livestock and pastures; emphasis on French Voisin system of rational grazing. *Prerequisites:* 11, 161. Three hours. Murphy. Alternate years, 1989-90.

**221 Tree Fruit Culture (2-3)** Theory and practice of modern commercial fruit science. Nutrition and cultural responses to various management practices. *Prerequisites:* 11, 161. Three hours. Boyce.

**232 Biological Control of Insect Pests (2-2)** Survey of the biological agents used in controlling insects and related arthropods, and their application and limitations. *Prerequisite:* An intermediate course in entomology. Three hours. MacCollom. Alternate years, 1988-89.

**261 Soil Classification and Land Use (2-4)** Classification of soils throughout the world as they relate to soil development and land use. Three Saturday field trips. *Prerequisite:* 61 or a total of six hours in ecology, geography, or geology. Three hours. Jokela. Alternate years, 1988-89.

**264 Chemistry of Soil and Water (3-3)** A biologically biased study of the colloidal chemistry of soil and its interfaces with roots, water, and air. *Prerequisites:* 161, two semesters chemistry. Four hours. Magdoff. Alternate years, 1988-89.

**266 Soil Physics (2-3)** Mathematical and physical principles of the soil-water-plant interaction and its relationship to production and management. *Prerequisites:* 161, one semester of physics. Three hours. Alternate years, 1989-90.

**297 Special Topics** Lectures, laboratories, readings, field projects, surveys, or research designed to provide specialized experience in horticulture, agronomy, soils, entomology, and integrated pest management. *Prerequisite:* Senior standing and/or permission. One to three hours.

**281 Seminar** Presentation and discussion of papers on selected topics of current interest by students and staff. Spring semester. *Prerequisite:* Senior standing. One hour.

## Political Science (PSCI)

### COLLEGE OF ARTS AND SCIENCES

*Professors Hilberg, Pacy, Wertheimer (Chairperson); Emeritus Professor Little; Associate Professors Bryan, Burke, Holland, Mahler, Moyser, Nelson, Niwola, Rice, Assistant Professors Altemus, Burgin, Feldman, Gaenslen, Machado, Neal, Stavakis, Taylor; Visiting Professor Reinhardt.*

*The following courses (21, 31, 51, 71, 81) may all be taken*

without prerequisite. Each course introduces students to a different subfield of political science.

**21 American Political System** Institutions, processes, and problems of American government. Three hours. Bryan, Burgin, Burke, Nelson, Nivola.

**31 Introduction to the Problems of Political Thought** Examination of basic problems in political philosophy, e.g. morality and law; punishment; freedom; equality; obligation and disobedience. Three hours. Feldman, Holland, Neal, Taylor, Wertheimer.

**51 International Relations** The state as actor in international relations. Global division and problems. Three hours. Altemus, Hilberg, Pacy, Stavrakis.

**71 Comparative Political Systems** Examination of political behavior, political structures, and political processes from a cross-national perspective. Three hours. Gaenslen, Mahler, Moysen.

**81 Political Behavior** Introduction to the political beliefs and activities of individual citizens. Topics include: voting, elections, socialization, and public opinion. Three hours. Rice.

All courses numbered 100-199 require sophomore standing and the appropriate core course.

**121 Law and Politics** An examination of civil and criminal justice in the U.S. *Prerequisite:* 21. Three hours. Holland, Machado.

**123 Philosophy of Law I** (Same as Philosophy 142.) Analysis of the nature of law, the relation between law and morality, obligation to obey the law, the judicial decision, responsibility in law, legal ethics. *Prerequisite:* 31 or Philosophy 1 or 2 or 3 or 4. Three hours. Wertheimer; Hall, Hansen, Kuflik (Philosophy).

**124 Philosophy of Law II** (Same as Philosophy 143.) Problems of liberty, e.g. freedom of expression, privacy, paternalism; scope and limits of the criminal law; philosophy of punishment; selected problems in criminal justice, e.g. plea bargaining, preventive detention. *Prerequisite:* 31 or Philosophy 1 or 2 or 3 or 4. Three hours. Wertheimer; Hansen, Kuflik (Philosophy).

**125 Crime and Public Policy** Analysis of the organization of the criminal justice system and alternative public policy responses to crime. *Prerequisite:* 21. Three hours. Holland.

**141 Introduction to Public Administration** Introduction to study of public administration emphasizing such matters as organization, management, personnel, financial administration, and policy making in modern bureaucracies. *Prerequisite:* 21. Three hours. Bryan, Burke.

**161 The Vermont Political System** Analysis of the political processes and institutions of governance in Vermont in the context of the federal system and other American states. *Prerequisite:* 21. Three hours. Bryan.

Courses numbered 170-179 may be taken by Area Studies majors without political science prerequisite if the student has the appropriate area studies background.

**171 Western European Political Systems** A comparative examination of the British, German, and French political systems. *Prerequisite:* 71. Three hours. Moysen.

**172 Russian and Eastern European Political Systems** Examination of the Russian and some other Eastern European Communist political systems. *Prerequisite:* 71. Three hours. Stavrakis.

**173 Canadian Political System** Institutions, process, and problems of the Canadian polity. *Prerequisite:* 71. Three hours. Mahler.

**174 Latin American Political Systems** Comparative examination of selected Latin American political systems. *Prerequisite:* 71. Three hours.

**175, 176 Asian Political Systems** Development of political institutions and processes in the 20th century with brief historical introductions. First semester: East Asia. Second semester: South and Southeast Asia. *Prerequisite:* 71. Three hours. Gaenslen.

**177 Political Geography** (See Geography 177.) *Prerequisite:* 51 or 71. Three hours. Bodman, Miles.

**178 The Israeli Political System** Background, contemporary political structures and behavior, and current foreign policy considerations in Israeli politics. *Prerequisite:* 71. Three hours. Mahler.

**179 The Holocaust** The destruction of the European Jews under the Nazi regime, 1933-45. *Prerequisite:* 51 or 71 or History 52. Three hours. Hilberg.

**181 Political Leadership** Methods of identifying leaders, their relationships with nonleaders and with one another, their impact on public policy, and their personalities and social backgrounds. Empirical theories about political leadership. *Prerequisite:* 21 or 81. Three hours. Nelson.

**182 Political Parties** Analysis of political parties with special emphasis upon party realignment and reform, campaign techniques for nomination and election, and comparative party systems. *Prerequisite:* 21 or 81. Three hours. Nelson.

**183 Fundamentals of Social Research** (Same as Sociology 100.) Introduction to research methods in social science. Includes examination of research design, measurement, data collection, data analysis, and the presentation and theoretical interpretation of research findings. *Prerequisite:* 21 or 81. Three hours. Berkowitz, Danigelis, Finney, McCann (Sociology).

**184 Voting Behavior** Introduction to theories of voter turnout and candidate choice. Topics include: the social background of voters, partisanship, political issues, the impact of campaigns and media. Primary, general, presidential, and congressional elections examined. *Prerequisite:* 21 or 81. Three hours. Rice.

**191, 192 Internships**

**193, 194 College Honors**

**195, 196 Intermediate Special Topics** Intermediate courses or seminars on topics beyond the scope of existing departmental offerings. See Schedule of Courses for specific titles.

**197, 198 Readings and Research**

All courses numbered 200-299 require: (1) junior or senior standing, (2) completion of at least three core courses including the specified core course, (3) completion of three hours at the 100 level or a specified 100-level course; or permission of instructor.

**211, 212 History of Political Thought** First semester: Development of political thought from Plato to Burke. Second semester: Political thought of the 19th and 20th centuries emphasizing socialist ideologies from Marx to Marcuse. *Prerequisites:* 31, three hours at 100 level. Three hours. Holland, Neal, Taylor, Wertheimer.

**213 Justice and Equality** (Same as Philosophy 242.) Examination of contemporary normative theories of distributive justice and equality. *Prerequisites:* 31, three hours at 100 level. Three hours. Wertheimer; Kuflik, Sher (Philosophy).

**216 American Political Thought** American political thought from the colonial period to recent times. *Prerequisites:* 21, three hours at 100 level. Background in American history recommended. Three hours. Holland, Taylor.

**221, 222 Constitutional Law** First semester: Emphasis on developing skills of legal analysis. Historical origins and general principles of constitutionalism. Second semester: Selected topics in constitutional law. *Prerequisites:* For 221, 121; for 222, 221. Three hours. Machado.



**225 The Judicial Process** Organization, functions, and behavior of state and federal courts. *Prerequisite:* 121. Three hours. Holland.

**227, 228 International Law** Principles and applications of public international law. *Prerequisites:* For 227, 51, three hours at 100 level; for 228, 227. Three hours. Little.

**231 The Congressional Process** Organization, procedure, and behavior of the chambers of the U.S. Congress. *Prerequisites:* 21, three hours at 100 level. Three hours. Burgin, Nelson.

**232 Public Policy Analysis** Examination of the principles for choosing between alternative public policies. Discussion of basic analytical tools, e.g. welfare economics, cost-benefit analysis, operations research. *Prerequisites:* 21, 31, three hours at 100 level; Economics 11-12 strongly recommended. Three hours. Nivola.

**233 Issues of Public Policy** Analysis of selected problems of public policy, e.g. welfare, macroeconomic policy, regulation, energy, and housing. *Prerequisites:* 21, 31, three hours at 100 level; Economics 11-12 strongly recommended. Three hours. Nivola.

**234 The Presidency** The functions and activities of the President and his staff. *Prerequisites:* 21, three hours at 100 level. Three hours. Burke.

**235 Defense Politics Seminar** U.S. defense politics, policies, and processes. Civil-military relations, strategic policy, arms control, defense-industrial complex, defense budget. *Prerequisite:* 251. Three hours. Altemus.

**239 American Politics** Examination of the politics of decision making in the American political system. *Prerequisite:* 21, three hours at 100 level. Three hours. Rice.

**241 Public Management** Analysis of the major elements of management in the public sector (organization, personnel, and budgeting) with special attention to problems arising from political imperatives generated by a democratic society. *Prerequisite:* 141. Three hours. Bryan, Burke.

**242 Topics in Public Administration** The political problems of the administrative state. *Prerequisite:* 141. Three hours. Bryan, Burke.

**244 The American Bureaucracy** An examination of the history, current structure, politics, behavior, reform, and accountability of the American federal bureaucracy. *Prerequisite:* 141. Three hours. Burke.

**250 Craft of Diplomacy** Emphasis on experiences and reflections of diplomatic personalities, supplemented by studies of specialists. *Prerequisites:* 51, three hours at 100 level. Three hours. Pacy, Reinhardt.

**251, 252 American Foreign Policy** First semester: Constitutional principles, institutional factors, and historic traditions in the formation of foreign policy. Second semester: Contemporary policies toward specified countries. *Prerequisite:* For 251, 21, 51, three hours at 100 level; for 252, 51, three hours at 100 level. Three hours. Altemus, Hilberg.

**256 International Organization** Theory and practice in supranational institutions. *Prerequisite:* 51, three hours at 100 level. Three hours. Pacy.

**261 Urban Government and Politics** An analysis of metropolitan governments and their problems and roles. *Prerequisite:* 21, three hours at 100 level. Three hours. Nivola.

**264 State Administration** Problems in planning, policy development, and program coordination. *Prerequisite:* 141. Three hours. Bryan.

**265 Intergovernmental Relations** Problems of the Federal system. National-state-local cooperative administration of selected public functions. *Prerequisite:* 21, three hours at 100 level. Three hours. Bryan, Nivola.

**273 Comparative Political Analysis** Selected topics. *Prerequisite:* 71, one course numbered 171-179. Three hours. Mahler.

**278 Foreign Policy of the USSR** (See History 278.) *Prerequisites:* 51, three hours at 100 level. Three hours. Daniels, Stavakis.

**283 Methods of Political Science Research** Examination of advanced problems in political methods. Topics include: measurement, correlation, multiple regression, and scaling techniques. *Prerequisite:* 183, or equivalent with permission of instructor. Three hours.

**284 Public Opinion: Theory and Research I** (Same as Sociology 241.)\* *Prerequisite:* 183 (Sociology 100). Three hours. Berkowitz, Danigelis (Sociology).

**285 Public Opinion: Theory and Research II** (Same as Sociology 242.)\* *Prerequisite:* 284 (Sociology 241). Three hours. Nixon, Sampson (Sociology).

**293 Senior Honors Seminar I** Examination of major contemporary research topics in political science. *Prerequisite:* Admission by invitation only. Three hours. (Not offered for graduate credit.)

**294 Senior Honors Seminar II** Tutorial format centered on individual student research projects and a comprehensive examination. *Prerequisite:* 293. Three hours. (Not offered for graduate credit.)

**295, 296 Advanced Special Topics** Advanced courses or seminars on topics beyond the scope of existing departmental offerings. See Schedule of Courses for specific titles.

**297, 298 Readings and Research** For advanced undergraduate and graduate students. Three hours.

\*Credit not given for both 284 and Sociology 241 or for both 285 and Sociology 242.

## Psychology (PSYC)

### COLLEGE OF ARTS AND SCIENCES

*Professors Achenbach, Albee, Bond, J. Burchard, Forgays, Howell (Chairperson), Joffe, Kapp, Lawson, Leitenberg, Musty; Associate Professors Bronstein, Compas, Gordon, Hasazi, Kessler, Leff, Miller, Rosen, Rothblum, Yadav; Assistant Professors Bouton, S. Burchard; Adjunct Associate Professor Cope-land; Adjunct Assistant Professors Stoltenberg, Thompson; Clinical Associate Professor Solomon; Clinical Assistant Professors Carling, Cioffari, Dietzel, Does, Peyser; Adjunct Instructors Benay; Research Assistant Professors Blanch, Hamilton, Pascoe, Wilson.*

Credit not given for 101 and 109 or 110.

**1 General Psychology** Introduction to the entire field, emphasizing the behavior of the normal adult human being. Three hours. Albee, Forgays, Musty.

**101 Introduction to Psychological Research Methods** Basic course in principles of experimental design, methodologies, and statistical procedures. Focus on preparing nonmajors to understand and evaluate psychological research. *Prerequisite:* 1. Three hours. S. Burchard. Credit not given for 101 and 109 or 110.

**109, 110 Principles of Psychological Methodology and Research** Prepares students to understand and conduct research in a variety of areas of psychology. Focus upon designs, methodologies, and statistical procedures essential for psychological research. Laboratory experiences. Credit not given for 101 and 109 or 110. *Prerequisite:* 1, 109 for 110. Four hours. Bouton, Gordon.

**119 History of Psychology** Review of major theoretical and empirical developments in psychology, including schools of psychology that have influenced contemporary models of psychology. *Prerequisites:* 1, junior or senior standing. Three hours. Howell, Musty.

**121 Biopsychology** Biological bases of behavior: classical and contemporary issues, including introduction to nervous system, behavioral effects of drugs, chemical bases of behavioral disorders. *Prerequisite:* 1 or Biology 1. Three hours. Kapp, Musty.

**130 Social Psychology** An introduction to concepts and methods used to study the behavior of individuals in various social situations. *Prerequisite:* 1. Three hours. Leff, Miller.

**132 Environment and Behavior** Introduction to Environmental Psychology. Major subareas of this field are discussed as they relate to the interaction between the behavior of individuals and the environment. *Prerequisite:* 1 or course in environmental studies. Three hours. Forgas.

**152 Abnormal Psychology** Describing and defining abnormal behavior; models of etiology; research evidence for biological and social models; methods of intervention and prevention. *Prerequisite:* 1. Three hours. Albee, Rothblum, Solomon.

**161 Developmental Psychology: Childhood** Survey of research and theories on child development from conception to adolescence emphasizing experimental analyses of early social and cognitive development. *Prerequisite:* 1. Three hours. Bond, Burchard.

**162 Development of Sex Differences** Critical analysis of research and theory on factors that influence the development of sex roles and purported sex differences in behavior, personality, and cognitive and intellectual functioning. *Prerequisite:* 1. Three hours. Bond, Joffe.

**163 Process and Effects of Mass Communication** Study of mass communication process and effects in socialization of children, diffusion of information, and persuasive campaigns in such areas as health, politics, consumer behavior. *Prerequisite:* 1. Three hours. Yadav.

### 193, 194 College Honors

**195, 196 Intermediate Special Topics** Intermediate courses or seminars on topics beyond the scope of existing departmental offerings. See Schedule of Courses for specific titles.

**197, 198 Research** Individual research under staff direction. *Prerequisite:* Departmental permission. Three to six hours.

**205 Learning** Analysis of theory and research on the basic learning process and behavior. *Prerequisite:* 110 or 101. Three hours. Bouton.

**206 Motivation** Theory and research on the nature of motives, their influence on behavior, and their relation to other psychological processes. *Prerequisite:* 110 or 101. Three hours. Joffe.

**220 Animal Behavior** Behavior of animals under controlled experimental conditions and in their natural environments. Consideration of evolution, development, function, and control of behavior. *Prerequisite:* 110 or 101 or Biology 102. Three hours. Bouton.

**221 Physiological Psychology I** Structure and function of mammalian nervous system, emphasizing neurological correlates of sensory experience and perception. Individual laboratory experience. *Prerequisite:* 110 or 101. Four hours. Kapp.

**222 Physiological Psychology II** Study of role of central nervous system mechanisms in determination of innate behavior, arousal, motivation, learning, and memory. Individual laboratory experience. *Prerequisite:* 221. Four hours. Kapp.

**223 Psychopharmacology** Effects of drugs (both medical and recreational) on behavior. Topics such as drug effects on learning, memory, motivation, perception, emotions, and aggression. *Prerequisites:* 110 or 101, 121 or 222. Three hours. Musty.

**230 Advanced Social Psychology** Advanced survey of current research on the behavior of individuals in social situations. *Prerequisite:* 110 or 101 or 130. Three hours. Miller.

**231 Psychology of Women** Psychological theories about women and research on women's roles. Biological, personality, cognitive, and developmental factors considered. *Prerequisite:* One psychology course at the 100 level. Three hours. Rothblum.

**233 Psychology of Environmental Experience** Explores different ways of perceiving and thinking about social and physical aspects of the environment. Emphasis on enhancing creativity, aesthetic appreciation, and ecological consciousness. *Prerequisite:* Advanced background in psychology, education, or environmental studies. Three hours. Leff.

**234 Psychology of Social and Environmental Change** Examines psychological foundations for beneficial changes in social and physical environments. Emphasizes action strategies and projects as well as utopian visions. *Prerequisite:* Advanced background in psychology or in environmental studies or a social science. Three hours. Leff.

**236 Theories of Human Communication** Study of the role of perception, human information processing, language, nonverbal codes, meaning, cognition, and interpersonal and sociocultural context in human communication process. *Prerequisite:* 109 or 101 or 130. Three hours. Yadav.

**237 Cross-Cultural Communication** Study of cultural factors, cognitive processes, communication patterns, and problems in cross-cultural communication; role of communication in development and social change in third world countries. *Prerequisites:* 109 or 101 or 130 or 230; other advanced background in education or a social science. Yadav.

**250 Introduction to Clinical Psychology** Study of basic principles of interviewing, testing, assessment from life situations, and report writing. Examination of the most common approaches to psychotherapy. *Prerequisites:* 152; 110 or 101. Three hours. Bronstein, Compas, Kessler.

**251 Behavior Disorders of Childhood** An overview of theory, research, and practice in developmental psychopathology from infancy through adolescence. The major disorders of social and emotional development reviewed. *Prerequisite:* 109 or 101 or 161 (109 may be taken concurrently). Three hours. Hasazi.

**253 Advanced Behavior Modification** Application of techniques for the modification of human behavior in a variety of educational and social situations involving the collection and analysis of behavioral data. *Prerequisites:* 109 or 101, 152. Three hours. J. Burchard.

**254 Primary Prevention** An examination of empirical approaches to prevention of mental and emotional disorders; history of public health methods; sources of support and opposition to prevention efforts. *Prerequisites:* 152. Three hours. Albee, Joffe.

**255 Introduction to Health Psychology** Psychology of the cause, treatment, and prevention of physical illness and disability. Topics include: stress, health behavior, medical compliance, patient-provider relationships, coping with illness. *Prerequisite:* 110 or 101 or advanced standing in Allied Health Sciences. Three hours. Rosen, Solomon.

**257 Personality** The understanding of personality development and human behavior from a psychoanalytic, humanistic, trait measurement, and sociocultural perspective. *Prerequisites:* 109 or 101. Three hours. Bronstein.

**261 Cognitive Development** Examination of research and theory concerning developmental changes in the human processing of information from infancy to adulthood centered around the work of Piaget. *Prerequisite:* 109 or 101 or 161 (109 may be taken concurrently). Three hours. Bond.

**262 Social Development** Examination of theory and research concerning interpersonal development in humans from infancy through adulthood. Relationships between language, cognition, and social development emphasized. *Prerequisite:* 109 or 101 or 161 (109 may be taken concurrently). Three hours.

**263 Disabilities of Learning and Development**

Seminar in etiology, treatments, prevention of developmental and learning disabilities within framework of current service and educational practices. Effectiveness, ethical, legal, psychological issues examined. *Prerequisites:* One 100-level psychology course or advanced standing in Psychology, Education, or Physical Therapy. Three hours. S. Burchard.

**264 Developmental Psychobiology** Analysis of research on development of humans and animals that emphasizes effects of events in the prenatal and early neonatal period, development of physiological systems affecting behavior, and evolutionary origins of behavior. *Prerequisite:* 110 or 101 or 121 or 161. Three hours. Joffe.

**266 Communication and Children** Study of the role of communication, especially television, in cognitive and social development from preschool to adolescence. Relationship between television violence and abnormal behavior examined. *Prerequisite:* 109 or 101 or 161 or 163. Three hours. Yadav.

**295, 296 Advanced Special Topics** Advanced courses or seminars on topics beyond the scope of existing departmental offerings. See Schedule of Courses for specific titles.

## Radiologic Technology (RT)

### SCHOOL OF ALLIED HEALTH SCIENCES

*Associate Professor Izzo (Chairperson); Instructors Benoit, Deininger, Giasson, Laberge; Lecturers Ball, Marschke; Clinical Assistant Professors Kieran, Tierney; Clinical Instructors Bohannon, Harris, McCarthy, Pembroke, Rich.*

#### FOR NONMAJORS

**55 The Use of Radiation in our Society** A mini-course to introduce nonmajors to radiation. Covers applications in medicine and industry as related to benefits and risks. *Prerequisite:* Sophomore standing. One hour (five weeks). Izzo, Marschke.

#### FOR ALL MAJORS

**1 Introduction to Patient Care (3-0)** Introduction to patient care, emergency and isolation procedures, medical terminology, ethics, radiation protection, and radiologic anatomy. Three hours. Ball, Giasson, Marschke.

**4 Introductory Radiologic Science (3-0)** Introduces students to ionizing radiation, emphasizing its interaction with matter, its effect on the human body, and methods of protecting patients and technologists. *Prerequisite:* Permission of instructor. Three hours. Marschke.

**77 Summer Clinical Practicum (0-40)** Thirteen weeks during summer at an affiliated hospital. Both 77 and 177 required to meet eligibility requirements of national certifying examinations. Three hours. Bohannon, Harris, Izzo, Kieran, McCarthy, Pembroke, Rich, Tierney.

**91, 92 Special Radiologic Projects** Independent projects under direction of faculty members. *Prerequisite:* Permission of faculty. Variable credit hours.

**177 Summer Clinical Practicum (0-40)** Thirteen weeks during summer at an affiliated hospital. Both 77 and 177 required to meet eligibility requirements of national certifying examinations. Three hours. Bohannon, Harris, Izzo, Kieran, McCarthy, Pembroke, Rich, Tierney.

**191, 192 Advanced Radiologic Projects** Independent projects under direction of faculty members. *Prerequisite:* Permission of department chairperson. Variable credit hours.

### NUCLEAR MEDICINE TECHNOLOGY MAJORS

#### 31 Introduction to Nuclear Medicine Technology

**(1-0)** Introduction to patient positioning, film processing, anatomical, pharmaceutical, and technical considerations in common imaging procedures. *Prerequisites:* Credit or concurrent enrollment in 33, Anatomy and Physiology 19-20. One hour. Benoit, Deininger, Giasson, Izzo.

**32 Radiopharmacology (3-0)** Introduction to concepts of radioactivity, dose calculations, radionuclide generators, radiopharmaceuticals and their biological tracing mechanisms, radiation protection, patient dosimetry, and quality control. *Prerequisites:* 31, concurrent enrollment in 34, 4. Three hours. Giasson, Izzo.

**33, 34 Nuclear Medicine Clinical Practicum (0-4)** Routine imaging procedures emphasizing patient positioning, instrumentation, and film processing on Gamma Cameras; includes introduction to pharmacology. *Prerequisite:* Enrollment in RT. One hour. Bohannon, Giasson.

**131 Nuclear Medicine Imaging (5-0)** Principles of imaging procedures emphasizing anatomy, physiology, pathology, radiopharmaceuticals, positioning, film critique and pathology recognition, instrumentation principles, computer applications, quality control, and current research. *Prerequisite:* 32 or permission of instructor. Five hours. Giasson, Izzo.

**132 Radioassays in Nuclear Medicine (2-2)** Principles and technical considerations for *in vivo* and *in vitro* clinical tests, emphasizing competitive binding and immunological techniques; includes equipment operation, quality control, and labs using commercial kits. *Prerequisites:* 32, Chemistry 3. Three hours. Giasson, Izzo, guest lecturers.

**133, 134 Advanced Nuclear Medicine Practicum (0-12)** Experience in advanced clinical and pharmacological procedures, including portable gamma camera, computers, departmental administration, cardiac studies, and radioassays. *Prerequisites:* 34 for 133, 133 for 134. Three hours. Bohannon, Giasson.

**138 Special Topics (2-0)** Covers departmental administration, licensure, emerging and related imaging modalities, registry review, and future trends. *Prerequisite:* Permission of instructor. Two hours. Izzo, guest lecturers.

### RADIATION THERAPY TECHNOLOGY MAJORS

**21, 22 Introduction to Radiation Therapy (1-0, 1-2)** Introduction to the theories and practice of radiation therapy technology through discussion and laboratory sessions. *Prerequisite:* 4 for 22; enrollment in Therapy program. Two hours. Laberge, Marschke.

**23, 24 Radiation Therapy Clinical Practicum (0-4)** Students observe and participate in the Medical Center Hospital of Vermont Radiation Therapy Department. *Prerequisite:* Enrollment in Therapy program. One hour. Marschke, Pembroke.

**121, 122 Radiation Therapy Techniques (3-0, 3-1)** Instructs students in the theory and clinical techniques involved in radiation therapy. *Prerequisite:* 121 for 122. Three hours, four hours. Marschke.

**123, 124 Senior Radiation Therapy Clinical Practicum (0-10)** A continuation of 23, 24 emphasizing increasing clinical capabilities. *Prerequisites:* 23, 24. Three hours each. Marschke, Pembroke.

**125 Clinical Oncology (3-0)** Educates the student in various types of neoplasms, methods of treatment, and elementary pathology. *Prerequisite:* Anatomy and Physiology 19-20 or permission of instructor. Three hours. Marschke.

**126 Senior Therapy Seminar (2-0)** Educates students in areas related to the physical and psychological care of the cancer patient. *Prerequisite:* Senior standing in Therapy program. Two hours. Marschke, guest lecturers.

## Recreation Management (RM)

### SCHOOL OF NATURAL RESOURCES

*Professor Manning (Program Chair); Associate Professors Gilbert, Hudspeth, Lindsay; Lecturers Koenemann, Vissering; Extension Professor Bevins; Adjunct Associate Professors Echelberger, More.*

**8 Recreation and Resources** Introduction to field of natural resource-based recreation. Broad perspective of recreation management including agencies, policies, history, and trends. Three hours. Lindsay.

**40 The American Wilderness** (See Natural Resources 40.) Three hours. Manning.

**50 Tourism Planning** Examination of tourism including its economic, environmental, and social effects. Emphasis on planning to maintain the integrity of tourist regions. Three hours. Manning.

**138 Park and Recreation Design** Recreational design methodology applied to the design of public and private recreational facilities. Four hours. Vissering.

**150 Recreation Management** Field experience in recreation planning, design, and resource measurement. *Prerequisite:* Natural Resources 25. Four weeks in summer following sophomore year. Four hours. Gilbert, Lindsay, Manning.

**151 Food and Lodging Management** Economic decision making for the food and lodging industry. Emphasis on analysis of business investment and profitability over the recreation firm's life. Credit cannot be granted for both 151 and Agricultural and Resource Economics 166. *Prerequisite:* Permission of instructor. Three hours. Bevins. Alternate years, 1988-89.

**153 Recreation Administration and Operations** Administration and operation of outdoor recreation agencies and businesses. Special emphasis on recreation administrative structures, personnel management, and maintenance of parks and outdoor recreation areas. *Prerequisites:* Senior standing, permission. Three hours. Koenemann.

**157 Ski Area Management** An analysis of current management problems affecting private ski areas in Vermont and the Northeast. *Prerequisites:* Senior standing, permission. Three hours. Gilbert. Alternate years, 1988-89.

**158 Resort Management and Marketing** Study of the management of year-round resort facilities. Emphasis on resort marketing, internal support functions, and associated recreational facilities. *Prerequisites:* Junior standing, permission. Three hours. Kaufman.

**182 Senior Recreation Seminar** In-depth seminars on current problems in the field of public and private outdoor recreation management. *Prerequisites:* Senior standing, permission. Two hours. Lindsay.

**188 Special Topics** Independent study. *Prerequisites:* Junior standing, permission. One to three hours.

**191 Recreation Management Practicum** Supervised field experience in national, state, urban, or private park and recreation operations. *Prerequisite:* Permission of instructor. One to six hours.

**225 Economics of Outdoor Recreation and Tourism** A socioeconomic analysis of recreation and tourism as an industry. Emphasis on regional, state, and community impact. *Prerequisites:* Economics 11, 12, or Agricultural and Resource Economics 61. Three hours. Bevins, Gilbert.

**235 Outdoor Recreation Planning** Planning large land areas for outdoor recreation use. Emphasis on the planning process relative to the leisure time use of natural resources. *Prerequisites:* 150 or Forestry 140; Plant and Soil Science 161 or Geology 1. Four hours. Lindsay.

**240 Wilderness and Wilderness Management** His-

tory, philosophy, and management of wilderness, national parks, and related areas. *Prerequisite:* Permission. Three hours. Manning. Alternate years, 1989-90.

**255 Environmental Interpretation** Philosophy, principles, and techniques of communicating environmental values, natural history processes, and cultural features to recreation visitors through the use of interpretive media. *Prerequisite:* 235 or permission. Four hours. Hudspeth.

## Religion (REL)

### COLLEGE OF ARTS AND SCIENCES

*Professor Martin (Chairperson); Associate Professors Andrews, Brenneman, Paden, Sugarman; Assistant Professors Gussner, Instructor Clark.*

*Credit will be given only for two courses at the introductory level. Credit will be given for only one from Religion 22, 23, 27.*

**20 Introduction to the Study of Religion: Comparative** Study of patterns and differences in man's religious life; selected comparisons of Asian, Western, and tribal religions. Three hours. Andrews, Brenneman, Gussner, Martin, Paden.

**21 Introduction to the Study of Religion: Asian Traditions** Introduction to the Hindu, Buddhist, and East Asian religious traditions as expressed in their basic symbolisms, writings, practices, and cultural forms. Three hours. Andrews, Brenneman, Gussner, Paden.

**22 Introduction to the Study of Religion: Western Traditions** Study of the basic motifs, mythic patterns, and historical transformations in the religious life of man from the ancient Near East to the modern West. Three hours. Andrews, Brenneman, Clark, Gussner, Martin, Paden, Sugarman.

**23 Introduction to the Study of Religion: Bible** Study of the basic motifs, mythic patterns, and historical transformations in the religious life of Western man as exemplified in the Biblical tradition. Three hours. Brenneman, Clark, Martin, Paden, Sugarman.

**27, 28 Introduction to the Study of Religion: Integrated Humanities** A survey of religious and philosophical thought in Western culture from Hebraic and Greek antiquity to the present. *Prerequisites:* Concurrent enrollment in Integrated Humanities Program, English 27, 28 and History 27, 28. Three hours. Martin, Paden, Sugarman.

**95, 96 Introductory Special Topics** Introductory courses or seminars on topics beyond the scope of existing departmental offerings. See Schedule of Courses for specific titles.

**100 The Interpretation of Religion** Examination of major theories and methods used in studying and interpreting religious phenomena. *Prerequisite:* Three hours in religion. Three hours. Brenneman, Gussner, Paden, Sugarman.

**101 The Social Dimension of Religious Life** Comparative study of communal forms of religious life, such as cosmic state, monasticism, sect, caste and denomination, from a variety of cultures—Eastern, Western, tribal, and modern—with a concern for their meanings as fundamental forms of religious expression. *Prerequisite:* Three hours in religion or sociology. Three hours. Andrews, Gussner, Martin.

**104 Mysticism, Shamanism, and Possession** Comparative study of ways in which the inward dimension of religious life finds expression. *Prerequisite:* Three hours in religion. Three hours. Martin, Paden.

**108 Myth, Symbol, and Ritual** Study of patterns and significance of myth and ritual as they appear in cross-cultural perspective, with reference to contemporary interpretations of

symbol and language. *Prerequisite:* Three hours in religion. Three hours. Brenneman, Paden.

**111 Foundations of Western Religious Thought** Study of ways in which Western religious thinkers—in both Greek and Biblical traditions—have expressed and responded to philosophical-theological questions about the nature of man, world, and God. *Prerequisite:* Three hours in religion. Three hours. Sugarman.

**114 Hebrew Scriptures** Study of the history and writings of the Hebraic-Judaic religion to the first century B.C. *Prerequisite:* Three hours in religion. Three hours. Sugarman.

**116 Judaism** Investigation of sustaining rituals, customs, institutions, and beliefs of normative Judaism. *Prerequisite:* Three hours in religion. Three hours. Sugarman.

**124 Christianity** Historical and phenomenological study of Christian origins and the central teachings and practices of the Eastern Orthodox, Roman Catholic, and Protestant branches of the Christian tradition. *Prerequisite:* Three hours in religion, or English 62. Three hours. Clark, Martin.

**131 Studies in the Hindu Tradition** Selected writings, rituals, and developments in the Hindu tradition with reference to cultural assumptions of India. *Prerequisite:* Three hours in religion. Three hours. Gussner.

**132 The Buddhist Tradition** A study of early and Mahayana Buddhist thought through examination of selected scriptures and engagement in several forms of Buddhist meditation. *Prerequisite:* One course in religion. Three hours. Andrews.

**141 Religion in Japan** An examination of Japanese values as expressed in folk, Shinto, and Buddhist traditions, and in social structures, aesthetic pursuits, or business practices. *Prerequisite:* One course in religion. Three hours. Andrews.

**145 Religion in China** Examination of the content and development of the folk, Confucian, Taoist, and Buddhist traditions, and of contemporary Marxist values. *Prerequisite:* One course in religion. Three hours. Andrews.

**155 Celtic Myth and Ritual** An examination of Celtic symbols, myths, and rituals focusing upon the Celts in Ireland, including their relationship to the Christian tradition in the 5th century A.D. *Prerequisite:* Three hours in religion. Three hours. Brenneman.

**157 Religion in America** Study of the relationship between religion, the cultural ethos, and identity in America. *Prerequisite:* Three hours in religion. Three hours. Martin.

**159 Religion and Secular Culture** The effects of modern culture on religion, and the emergence of new forms of religious life and expression. *Prerequisite:* Three hours of religion. Three hours. Brenneman, Sugarman.

**162 Studies in Cultural Lore** Examination of loric dimensions of the sacred. A look into the little places that disclose those elements and qualities that define particularity of given culture, as expressed in tale, legend, festival, custom, craft, and architecture. *Prerequisite:* Six hours in religion, or three hours in religion and three hours in folklore studies or anthropology. Three hours. Brenneman.

**168 Contemporary Spiritual Life** Study of man's involvement with the spiritual as manifested in contemporary religious groups, or in modern theory and practice of meditation. *Prerequisite:* Three hours in religion. Three hours. Gussner.

### 193, 194 College Honors

**195, 196 Intermediate Special Topics** Intermediate courses or seminars on topics beyond the scope of existing departmental offerings. See Schedule of Courses for specific titles.

**197, 198 Readings and Research** Variable credit.

**201 Senior Seminar: Creative Hermeneutics** Selected contemporary issues in theory and interpretation; group

interpretations of common texts or phenomena; preparation and presentation of individual senior projects. *Prerequisites:* Twelve hours in religion, including 100 and six hours at the intermediate level, senior standing. Three hours.

**214 Studies in Judaica** Selected topics of concentration emerging out of and related to the study of normative Judaism, e.g. the prophetic faith, Rabbinic Judaism, Hasidism, and Jewish mysticism. *Prerequisite:* Nine hours in religion, with three hours at the intermediate level (116 recommended). Three hours. May be repeated up to six hours. Sugarman. (Not offered for graduate credit.)

**226 Studies in Hellenistic Religion** Study of religion in the Mediterranean area during the period from the 4th century B.C. through the 4th century A.D. including Christian origins. *Prerequisite:* Nine hours in religion, with three hours at the intermediate level. Martin. (Not offered for graduate credit.)

**228 Studies in Western Religious Thought** Important figures, issues, movements, or texts will be selected for special examination. *Prerequisite:* Nine hours in religion, with three hours at the intermediate level. Three hours. May be repeated up to six hours. Clark, Sugarman. (Not offered for graduate credit.)

**240 Studies in Asian Religions** Concentrated studies in the history, life, or thought of a selected Asian religious tradition. *Prerequisite:* Three hours in religion at intermediate level in the same religious tradition. Three hours. Andrews, Gussner.

**280 Symbol and Archetype** Study of the work of C.G. Jung and the Jungian circle as it bears upon the interpretation of religion and as it represents a 20th century religious quest. *Prerequisite:* Nine hours in religion, with six hours at the intermediate level. Three hours. Martin, Paden. (Not offered for graduate credit.)

**291, 292 Topics in the History and Phenomenology of Religion** *Prerequisites:* Nine hours in religion, with six hours at the intermediate level, junior standing. May be repeated up to six hours.

**297, 298 Interdisciplinary Seminar** Student-faculty workshop on a topic of current interest, employing resources from various disciplines. *Prerequisites:* Nine hours in religion, with six hours at the intermediate level, junior standing, permission of instructor. Three hours. (Not offered for graduate credit.)

## Resource Economics (RSEC)

### SCHOOL OF NATURAL RESOURCES

Associate Professors Armstrong, Gilbert (Program Chair); Extension Professor Bevins.

**RSEC 121 Resource Economics** Evaluation of the economic forces affecting resource allocation, tools of economic analysis, and economic implications of current resource utilization practices. *Prerequisite:* Economics 11 or Forestry 151 or Agricultural and Resource Economics 61. Three hours. Gilbert.

**AREC 162 Land Economics Issues** (See Agricultural and Resource Economics 162.) Three hours.

**RSEC 222 Natural Resources Evaluation** An analysis of economic procedures used in the evaluation of public natural resource developments, emphasizing benefit-cost analysis. *Prerequisite:* 121. Three hours. Gilbert.

**RM 225 Economics of Outdoor Recreation and Tourism** (See Recreation Management 225.) Three hours. Bevins, Gilbert.

**RSEC 255, 256 Special Topics in Resource Economics**

## Romance Languages (FREN, ITAL, SPAN)

### COLLEGE OF ARTS AND SCIENCES

Professors Carrard, Weiger, Zarate; Associate Professors Crichfield, T. Geno, Murad (Chairperson), Senecal, Wesseling, Whatley; Assistant Professors Chabut, van Slyke, Whitebook; Instructors Roof, Smith; Lecturer M. Geno; Visiting Assistant Professor Causa-Steindler.

*French, Italian, and Spanish language and literature courses are listed separately below by title and number. The language sequences are designed specifically to train students in the four skills of speaking, comprehension, reading, and writing. The total sequence in each language represents a continuum into which students with previous experience in the language will be placed according to their level of achievement, regardless of how many or how few years they may have studied it. For placement in advanced language courses (100 or above), first-year students should consult with this department. Students may not take a language course lower than the level most recently attained except with the permission of the department. This stricture does not apply to literature or civilization courses.*

*The first two semesters of a foreign language are excluded from the 45-hour limit on courses from a single department that can be counted toward the 122 hours required for the Bachelor of Arts degree.*

### FRENCH LANGUAGE

**1, 2 Elementary** Fundamentals of pronunciation, reading, and writing taught by use of dialogues, grammar drills, conversational activities, and short compositions. No prior knowledge expected. Four hours each course.

**9 Basic French Grammar Review** Thorough review of French grammar in preparation for intermediate level. Considerable emphasis on written exercises. Three hours.

**51, 52 Intermediate Reading and Conversation** Designed to help students speak, and to progress from a basic knowledge of French to the ability to read and understand spoken French well. Courses include some grammar review and short compositions. Three hours each course.

**95, 96 Introductory Special Topics** Introductory courses or seminars on topics beyond the scope of existing departmental offerings. See Schedule of Courses for specific titles.

**101 Intensive Written Expression** Guided practice of French written expression through a systematic study of writing processes and strategies. Three hours.

**102 Intensive Oral Expression** Guided practice of oral-aural skills through vocabulary and pronunciation exercises, readings, and oral presentations. Writing exercises reinforce oral work. Three hours.

**201 Advanced Composition and Conversation** Course activities (discussions, exposes, written work, etc.) designed to lead to mastery of French oral and written expression. Three hours. (Not offered for graduate credit.)

**209 Advanced Grammar** Comparative grammatical study centered on the specific problems encountered by Anglophones in written and spoken French. Three hours. M. Geno.

**210 Romance Philology** Development of French, Spanish, and Italian from Latin. Study of documents. *Prerequisite:* Intermediate level in at least two of the languages, or permission. Taught in English. Three hours. Whitebook. Alternate years, spring 1989.

**215 Methods of Text Analysis** Introduction to procedures and terminology used in analysis of texts of various genres. Three hours. Carrard.

**216 Stylistics** Study of idiomatic difficulties faced by people who learn French; translation; analysis of the various

"levels of speech" in French, with their stylistic features. Three hours. Carrard.

### ITALIAN LANGUAGE

**1, 2 Elementary Italian** Fundamentals of Italian: comprehension, pronunciation, speaking, reading, and writing. The structure of the basic Italian sentence. Four hours.

**51, 52 Intermediate Readings and Conversation** Designed to enable students to read modern Italian texts and to discuss them in Italian. Courses include some grammar review and short compositions. Three hours each course.

**121, 122 Italian Civilization and Culture** Emphasis on increasing oral and written command of the language. Class discussions and written work are based on literary selections, newspaper and magazine articles, and film scripts. *Prerequisite:* 52 or equivalent. Three hours.

### SPANISH LANGUAGE

**1, 2 Elementary** Fundamentals of Spanish: pronunciation; speaking; reading; the structure of the basic Spanish sentence. Four hours each course.

**9 Basic Spanish Grammar Review** Thorough review of Spanish grammar in preparation for intermediate level. Considerable emphasis on written exercises. Three hours.

**51, 52 Intermediate Reading and Conversation** Spanish texts will be read for content and discussed in Spanish. Courses include some grammar review and short compositions. Three hours each course.

**95, 96 Introductory Special Topics** Introductory courses or seminars on topics beyond the scope of existing departmental offerings. See Schedule of Courses for specific titles.

**101, 102 Composition and Conversation** Writing practice, sentence structure, correct expression, and guided discussions in Spanish of assigned topics. A good command of basic grammar expected. Three hours each course.

**109 Spanish Grammar** An intensive study of Spanish grammar. Topical approach. Three hours.

**201, 202 Advanced Composition and Conversation** To improve both written and oral proficiency. Textbook supplemented by panel discussions, debates, translation, and a weekly composition. Three hours each course. (Not offered for graduate credit.)

**210 Romance Philology** (See French 210.) Three hours.

### LITERATURE COURSES IN FRENCH AND SPANISH

*As the language courses offer a continuum for the learning of the four skills, the literature courses provide a sequential study of the development of French and Spanish literatures from the Middle Ages to the present. In addition, they offer both practice and continued training in the four language skills. While the literature courses are divided into centuries, with subcategories of genres, themes, and individual authors, it is not essential to adhere strictly to chronological order. In general, a 100-level literature course or its equivalent is the prerequisite for all other literature courses; exceptions are regularly made with the approval of the department. Unless otherwise stated, all courses above the intermediate level will be conducted in the foreign language in question. Questions about the precise content of any literature course should be referred to the instructor listed for the course or to the department chairperson.*

### FRENCH LITERATURE AND CIVILIZATION

**155, 156 Masterworks** Overview of French literature (155: Middle Ages to Revolution; 156: 19th, 20th centuries) through reading of outstanding works representing major

authors, periods, themes, and forms. *Prerequisite:* French 52 or equivalent. Three hours each course. Crichfield.

**175 French Humor** Analysis of theories of humor; comparison of French and American styles. Authors such as Rabelais, Moliere, Feydeau, Voltaire, Ionesco; Cami, Allais, Dac, Sempe, Daninos. Three hours. Whitebook. Alternate years, 1988-89.

**193, 194 College Honors**

**195, 196 Intermediate Special Topics** Intermediate courses or seminars on topics beyond the scope of existing departmental offerings. See Schedule of Courses for specific titles.

**197, 198 Readings and Research**

**225 Medieval French Literature** First semester: Old French language; 12th century epics, e.g. *La Chanson de Roland*, *Le Pelerinage de Charlemagne*, Breton lays; Marie de France. Three hours. Whitebook. Alternate years, 1989-90.

**226 Medieval French Literature** Second semester: Romances: Chretien de Troyes, Guillaume de Lorris and Jean de Meung; lyric poetry, Machaut; Pisan; Charles d'Orleans; farces and miracles. *Prerequisite:* 225. Three hours. Whitebook. Alternate years, 1989-90.

**235 16th Century France: A World in Transition** Focuses on literary, esthetic, and cultural aspects of the 16th century, a pivotal era between medieval and modern societies. Three hours. Alternate years, 1989-90.

**236 The Developing Renaissance in France** The Renaissance as a cultural and esthetic phenomenon in the years 1530-60, its changing influence on French thought and culture. Three hours. Alternate years, 1989-90.

**245 The Baroque Age 1600-1650** The literature after France's civil wars up to the triumph of classicism: religious, lyric, and political poetry; idealistic, picaresque, and fantastic novels; baroque drama; Pascal. Three hours. Whatley. Alternate years, 1988-89.

**246 17th Century** Selected works of the century with emphasis on Corneille, Racine, and Moliere. Three hours. Chabut. Alternate years, 1988-89.

**247 Moliere** (Same as Theatre 229.) A study of the major portion of Moliere's comic creation as classical French theatre and literature. Three hours. T. Geno. Alternate years, 1989-90.

**255 18th Century Literature** Writers of the early Enlightenment. Possible topics: the impact of the new science; the literary reflection of new social types; the "pursuit of happiness." Three hours. Chabut, Whatley. Alternate years, 1989-90.

**256 18th Century Literature** Rousseau, Diderot, Laclos, Sade: the generation before the Revolution. Possible topics: the attempts to define "natural man;" the relationship between the arts and morality, between liberty and libertinism. Three hours. Chabut, Whatley. Alternate years, 1989-90.

**265 The Romantic Period** Major figures and themes of the Romantic movement, including Chateaubriand, Madame de Stael, Hugo, Balzac, Stendhal, Musset. Possible topics: the revolt against Classicism, the Romantic view of nature, *le vague des passions*. Three hours. Crichfield. Alternate years, 1989-90.

**266 Realism to Symbolism, 1850-1900** The rise of modern literary realism, Naturalism, Symbolist poetry, Decadence. Authors include Flaubert, Zola, Maupassant, Baudelaire, Verlaine, Rimbaud, Mallarme, Huysmans. Three hours. Crichfield. Alternate years, 1989-90.

**275, 276 20th Century Literature** Selected topics dealing with poetry and/or narrative related either to an historical period or a literary movement. Three hours. Carrard. Alternate years, 1988-89.

**277 Topics in 20th Century French Theatre** Subjects may include: *le theatre traditionnel*, *le theatre "de l'absurde"*, *le theatre de la marge*, a combination of all the above.

Each may be repeated up to six hours. Three hours. T. Geno. Alternate years, 1989-90.

**285 Quebec Literature I** Study of fiction and poetry from 1835 to 1940. Three hours. Senecal. Alternate years, 1988-89.

**286 Quebec Literature II** A continuation of 285, encompassing fiction, poetry, and theatre from 1940 to 1975. Three hours. Senecal. Alternate years, 1988-89.

**289 African Literature of French Expression** Study of West African poetry, theatre, novel, and civilization as an expression of the Black experience in the language of the French colonizer. Three hours. T. Geno. Alternate years, 1988-89.

**291 Civilization of France** A study of the evolution of French institutions in their geographic, political, social, economic, and intellectual contexts from the Middle Ages to the Second World War. Three hours. M. Geno.

**292 Contemporary Civilization of France** A study of French institutions and daily life since the Second World War, emphasizing the most recent changes. (French 291 or History 53 or 153 strongly recommended.) Three hours. M. Geno. Alternate years, fall 1988.

**293 Quebec Culture** Sociocultural study of the Franco-phone civilization of Canada. Three hours. Senecal. Alternate years, 1989-90.

**295, 296 Advanced Special Topics** Advanced courses or seminars on topics beyond the scope of existing departmental offerings. See Schedule of Courses for specific titles.

**297, 298 Advanced Readings and Research**

**SPANISH LITERATURE AND CIVILIZATION**

**155 Masterworks** Representative novels, plays, poetry of the period before 1800. Three hours. Wesseling. Alternate years, 1988-89.

**156 Masterworks** Representative plays, novels, poetry since 1800. Three hours. Wesseling. Alternate years, 1988-89.

**158 History of Modern Spain** Topical approach to the study of Spanish history since 1808. Emphasis on causes and issues of the Civil War of 1936. Three hours. Wesseling. Alternate years, 1989-90.

**185 Readings in Spanish American Literature** Survey of the literature of Spanish America from pre-Columbian times through the colonial period and Romanticism. Three hours. Zarate. Alternate years, 1989-90.

**186 Readings in Spanish American Literature** Survey of the literature of Spanish America from *Modernismo* through *Vanguardismo*, *Realismo Magico* to the present. Three hours. Murad. Alternate years, 1989-90.

**193, 194 College Honors**

**195, 196 Intermediate Special Topics** Intermediate courses or seminars on topics beyond the scope of existing departmental offerings. See Schedule of Courses for specific titles.

**197, 198 Readings and Research**

**235, 236 Golden Age** The picaresque novel, the drama and poetry of the 16th and 17th centuries, emphasizing Lope de Vega, Calderon, Quevedo, Tirso de Molina. Three hours each course. Weiger. Alternate years, 1989-90.

**245, 246 Cervantes** *Don Quijote*, the *Novelas Ejemplares*, and the theatre of Cervantes. Three hours each course. Weiger. Alternate years, 1989-90.

**265 19th Century Spanish Literature** Romanticism and realism: (1) Romantic theatre; (2) the realist and naturalist novelists: Galdos and Leopoldo Alas. Three hours. Wesseling. Alternate years, 1989-90.

**276 The Reawakening in the 20th Century** Origins and main aspects of the intellectual conflicts in modern Spain as reflected in the literary works from the "Generation of 1898" to the present. Three hours. Alternate years, 1989-90.



**281 Spanish-American Prose Fiction of the 20th Century** A study of representative works by major authors tracing the development of narrative forms from their roots in the last century to the present. Three hours. Murad. Alternate years, 1989-90.

**285, 286 Spanish-American Literature of Social Protest** Readings of major works tracing the various directions of social protest against: (a) the Spanish political system, (b) local governments, (c) imperialism. Three hours each course. Zarate. Alternate years, 1988-89.

**291 Civilization of Spain** Topical approach to the study of Spanish Civilization emphasizing ideas, art, literature, and music. Three hours. Alternate years, 1988-89.

**293 Latin American Civilization** A study of the ideas, art, literature, and music of Latin America against the background of the history and culture of the region. Three hours. Zarate. Alternate years, 1989-90.

**295, 296 Advanced Special Topics** Advanced courses or seminars on topics beyond the scope of existing departmental offerings. See Schedule of Courses for specific titles.

**297, 298 Advanced Readings and Research**

*The following extra-departmental courses may be taken for credit toward a major in the Department of Romance Languages:*

**General Literature 72** Romance Literature in Translation (see page 143.)

**Linguistics 101, 102** (See page 143.)

## Russian (RUSS)

### COLLEGE OF ARTS AND SCIENCES

*Associate Professor Nalibow; Assistant Professor McKenna.*

The first two semesters of a foreign language are excluded from the 45-hour limit on courses from a single department that can be counted toward the 122 hours required for the Bachelor of Arts degree.

**1, 2 Elementary Russian** Four hours each course. McKenna, Nalibow.

**51, 52 Intermediate Russian** *Prerequisite:* 1, 2. Four hours each course. McKenna, Nalibow.

**95, 96 Introductory Special Topics** Introductory courses or seminars on topics beyond the scope of existing departmental offerings. See Schedule of Courses for specific titles.

**101, 102 Introduction to Russian Literature** Outstanding authors of the 19th and 20th centuries from Pushkin to Pasternak and Solzhenitsyn. Oral discussion of readings, written practice. *Prerequisites:* 51, 52. Three hours each course. McKenna, Nalibow.

**103, 104 Russian Civilization** Introduction to the history of Russian culture including Russian secular and ecclesiastical painting, architecture, and music from the earliest periods to the present. *Prerequisites:* 51, 52. Three hours each course. McKenna, Nalibow.

**193, 194 College Honors**

**195, 196 Intermediate Special Topics** Intermediate courses or seminars on topics beyond the scope of existing departmental offerings. See Schedule of Courses for specific titles.

**197, 198 Readings and Research**

**203, 204 Advanced Russian** Advanced oral and written drill, grammar review, lexical problems, roots of the Russian language. Lectures and discussions on the Russian lan-

guage. Three hours each course. McKenna, Nalibow. (Not offered for graduate credit.)

**271 Seminar in Slavic Linguistics** The linguistic prehistory of Slavic and the study of Old Church Slavic. Linguistic history of the Russian language. Three hours. Nalibow. (Not offered for graduate credit.)

**281, 282 Senior Seminar** For senior concentrators. Three hours each course. McKenna, Nalibow. (Not offered for graduate credit.)

**295, 296 Advanced Special Topics** Advanced courses or seminars on topics beyond the scope of existing departmental offerings. See Schedule of Courses for specific titles.

### GENERAL LITERATURE

**181 Russian Literature in Translation** (See Extra-Departmental Courses.) McKenna.

**182 Soviet Literature in Translation** (See Extra-Departmental Courses.) McKenna.

## Social Work (SWSS)

### COLLEGE OF EDUCATION AND SOCIAL SERVICES

*Professors Coward; Associate Professors Burrell, Paolucci-Whitcomb, Rathbone-McCuan, Thompson; Assistant Professor Neito.*

**2 Foundations of Social Work** Introductory course in Social Work to develop an understanding of existing social service delivery systems and their history. Three hours.

**47 Human Behavior in the Social Environment I** Introduction to the life span developmental model of the individual and human behavior. *Prerequisite:* Biology 3. Three hours.

**48 Human Behavior in the Social Environment II** A systems approach to understanding various levels of social organization; for example, families, groups, organizations, and communities. *Prerequisite:* 47. Three hours.

**51 Human Needs and Social Services** Students give service in a social agency, relate observations to learnings about agency structure, programs, and operations. Students assess their commitment to working with people. Three hours. (Optional)

**165 Issues and Policy in Social Welfare I** Introduction to social welfare policy, programs, and services in the U.S.; reviews several fields of practice. *Prerequisites:* 2, 47, 48, Economics 11, Political Science 21, Psychology 1, Sociology 1. Three hours.

**166 Issues and Policy in Social Welfare II** In-depth examination of social welfare policy and accompanying social services in the U.S.; major policy analysis models presented and used. *Prerequisites:* Student standing — accepted social work major or permission; 165. Three hours.

**167 Racism and Contemporary Issues** Study of perception, conceptualization, and comprehension of racism. Strategies, techniques, and procedures to deal and combat many facets of racism. Three hours.

**168 Social Work Intervention I** Practice methods employed by social workers in providing services to individuals and in group situations. Three hours.

**169 Social Work Intervention II** Practice methods employed by social workers in providing services to families and communities. *Prerequisites:* Student standing — accepted SW major or permission; 168. Three hours.

**170 Field Experience** Field experience under supervision given in social agencies four and one-half days each

week. To be taken concurrently with 171. *Prerequisites:* 169, majors, senior standing. Twelve hours.

**171 Field Experience Seminar** Weekly seminar in conjunction with 170. *Prerequisite:* Concurrent enrollment in 170. Three hours.

**194 Introduction to Social Work Research** Introduction to social research skills for social workers. *Prerequisites:* Student standing — accepted SW major or permission. Three hours.

**291, 292 Senior Seminar** Weekly seminar for social work majors to examine issues in social work practice. *Prerequisites:* Senior standing, SW majors. Three hours.

## Sociology (SOC)

### COLLEGE OF ARTS AND SCIENCES

*Professors* Cutler, Folta (Chairperson), Lewis, Loewen, Nixon, Sampson, Stanfield; *Associate Professors* Berkowitz, Danigelis, Fengler, Finney, Fishman, McCann, Mintz, Schmidt; *Lecturer* Cowan.

**1 Introduction to Sociology** Fundamental principles and problems in the sociological analysis of the structure and dynamics of modern society. Three hours.

**9 Small Group Communication and Leadership** Introduction to the analysis of interpersonal behavior and communication in face-to-face interaction situations with special attention to leadership, problem analysis, and decision making. Three hours.

**11 Social Problems** Introduction to sociology through detailed examination of a selected number of major structural problems characteristic of contemporary societies. Problems treated may vary. Three hours.

**14 Deviance and Social Control** Analysis of the causes and consequences of social behavior that violates norms. Examines patterns of deviant socialization and social organization and forms of deviance control. Three hours. Fishman, Folta, McCann, Stanfield.

**19 Race Relations in the U.S.** Analysis of racial prejudice, discrimination, and other dominant group practices directed toward Native, Asian-, and Afro-Americans and their social movements for integration, accommodation, and separatism. Three hours. Danigelis, Fishman, Loewen.

**20 Aging: Change and Adaptation** (Same as Nursing 20 and Early Childhood and Human Development 20/Education) Individual and social meanings of aging and old age; physical, physiological, psychological, and sociological changes accompanying aging; individual, family, community, and societal adaptations to aging. Three hours. Brown, Cutler.

**25 Alienation in Modern Society** Examination of the forms of social separation and estrangement of individuals in industrial societies; their origins in and consequences for sociocultural organization and change. Three hours. Sampson.

**29 Sex, Marriage, and the Family** Description and analysis of contemporary patterns in American sexual, marital, and familial behavior; their historical development, variants, and the evolving alternatives to traditional normative forms. Three hours. Berkowitz, Fengler.

**43 Survey of Mass Communication** The historical development of the socioeconomic, political, educational, and religious impacts of the press, film, radio, and television in American society. *Prerequisite:* 1 or Psychology 1. Three hours. Lewis.

**51 Religious Deviance, Magic, and the Occult** Analysis of the social and cultural organization of groups pro-

fessing deviant spiritual, occult, mystical, and/or magical beliefs and their relationships to the institutions of society. Three hours. Sampson.

**57 Drugs and Society** Patterns of illicit drug distribution, use, abuse, and control in contemporary society. Examines the interaction of cultural, social, psychological, and physiological factors in prohibited drug-taking. Three hours.

**58 Alcoholism and Society** Examination of alcohol use and abuse in contemporary society. Special attention to the cultural, social, psychological, and physiological causes and consequences of alcohol addiction. Three hours.

**63 Sociology of Sport** Analysis of the sociocultural organization and institutional relationships of sport in contemporary society. Also examines the social origins of athletes and the functioning of athletic groups. Three hours. Nixon.

**95, 96 Introductory Special Topics** Introductory courses or seminars on topics beyond the scope of existing departmental offerings. See Schedule of Courses for specific titles.

*All courses numbered 100-199 require three hours of sociology, preferably Sociology 1, specified experience or work in another discipline as indicated, or the permission of the instructor.*

**100 Fundamentals of Social Research** (Same as Political Science 183.) Introduction to research methods in social science. Includes examination of research design, measurement, data collection, data analysis, and the presentation and theoretical interpretation of research findings. *Prerequisite:* Three hours of sociology or six hours in a related social science. Four hours. Danigelis, Finney, Loewen, McCann.

**102 Population, Environment, and Society** Analysis of the causes and consequences of varying relationships among population size, distribution and composition, social organization, technology, and resource base. *Prerequisite:* Three hours of sociology. Three hours. McCann.

**105 The Community** Comparative examination of patterns of social interaction in social groups with common territorial bases in contemporary societies and the analysis of community structure and dynamics. *Prerequisite:* Three hours of sociology. Three hours. Lewis, Loewen, Schmidt.

**109 The Self and Social Interaction** Analysis of the roles of sociocultural and situational factors in individual behavior and experience and the social genesis, development, and functioning of human personality. *Prerequisite:* Three hours of sociology or Psychology 1. Three hours. Folta, Nixon, Sampson.

**115 Crime** Analysis of the nature and types of behavior that violates law, the mechanisms for defining such behaviors as criminal and their causes and consequences. *Prerequisite:* Three hours of sociology. Three hours. Fishman, McCann, Stanfield.

**119 Minority Groups** (Same as Anthropology 187.) Analysis of the causes and consequences of the subordination of ethnic, racial, and religious groups in society. Examination of patterns of prejudice, discrimination, and intergroup relationships. *Prerequisite:* Three hours of sociology. Three hours. Danigelis, Loewen.

**120 Aging in Modern Society** Analysis of contemporary needs and problems of the elderly, including discrimination, poverty, health care, and loneliness, and the evaluation of services and programs for the elderly. *Prerequisite:* Three hours of sociology or professional experience working with the elderly. Three hours. Fengler, Folta.

**122 Women and Society** Analysis of the changes in the role of women in contemporary society and their consequences for female socialization, the family, and the other major social institutions. *Prerequisite:* Three hours of sociology. Three hours. Fengler, Mintz.

**125 Organizational Communications** Analysis of the organizational problems of effective internal communication, access by clients and publics, propaganda and influence, and

interorganizational communications. *Prerequisite:* Three hours of sociology. Three hours.

**126 Social Problems in Organizations** Examination of selected problems associated with modern organizations, including worker injury and dissatisfaction, democratic participation, public accountability, corporate concentration, crime, corruption, and organizational effectiveness. *Prerequisite:* Three hours of sociology. Three hours. Berkowitz, Finney, Sampson.

**129 Problems in Family and Kinship Analysis** Presentation and critical examination of selected contemporary approaches to family and/or kinship research in sociology. Approaches and topics vary. *Prerequisite:* 10, 29, or six hours in a related social science. Three hours. Fengler.

**132 Affluence and Poverty in Modern Society** Examination of structured social inequality in contemporary American society with special attention to the distribution of wealth and its relationship to power, prestige, and opportunity. *Prerequisite:* Three hours of sociology. Three hours. Berkowitz, Danigelis, Finney, McCann, Mintz, Sampson.

**141 Language and Society** Examination of the relationship between languages, perception, thought, and the sociocultural contexts of meaning and communication. *Prerequisite:* Three hours of sociology. Three hours. Lewis.

**151 Sociology of Religion** Analysis of the sociocultural organization of religions with special attention to the changing forms of religion in contemporary society and their relationships to other institutions. *Prerequisite:* Three hours of sociology or six hours of religion. Three hours. Sampson.

**154 Social Organization of Death and Dying** Comparative examination of sociocultural adaptations to mortality with special attention to family, medical, legal, religious, and economic responses to fatal illness and death in contemporary society. *Prerequisite:* Three hours of sociology. Three hours. Folta.

**161 Sociology of Leisure** Analysis of the sociocultural organization of nonwork activity, emphasizing the relationships of class, life style, education, and work to contemporary recreation and leisure use patterns. *Prerequisite:* Three hours of sociology. Three hours. Danigelis.

**167 The Social Structure of Canada** Analysis of Canada as a social system emphasizing Canadian identity, the integration of an ethnically plural society, social class, and national and regional interests. *Prerequisite:* Three hours of sociology, or either History 76, Political Science 173, or Geography 52. Three hours. Berkowitz, Stanfield.

### 193, 194 College Honors

**195, 196 Intermediate Special Topics** Intermediate courses or seminars on topics beyond the scope of existing departmental offerings. See Schedule of Courses for specific titles.

### 197, 198 Readings and Research

*All courses numbered 200-299 require a minimum of six hours of sociology, three of which must be at the 100 or intermediate level, equivalent preparation as indicated or permission of the instructor.*

**204 Ecological Perspective on Human Communities** Analysis of relationships between the social, economic, and technological organization of communities and their physical and sociocultural environments. Emphasis upon community land use and settlement patterns. *Prerequisite:* Six hours of sociology or Anthropology/Geography 179. Three hours. Schmidt.

**205 Rural Communities in Modern Society** The changing structure and dynamics of rural social organization in context of modernization and urbanization. Emphasis on rural communities in the U.S. *Prerequisite:* Six hours of sociology. Three hours. Finney, Schmidt.

**206 Urban Communities in Modern Society** The changing structure and dynamics of urban social organization

in context of modernization and urbanization. Emphasis on cities and metropolitan areas in the U.S. *Prerequisite:* Six hours of sociology. Three hours. Loewen.

**207 Community Organization and Development** Communities as changing sociocultural organizational complexes within modern society. Special attention given to problems of formulation and implementation of alternative change strategies. *Prerequisite:* Six hours of sociology. Three hours. Finney, Schmidt.

**208 Interpersonal Communication** Contemporary theory and research on communications in dyadic relationships emphasizing verbal and nonverbal aspects of self-disclosure, listening, coping, conflict, and therapeutic interaction. *Prerequisite:* 141 or nine hours of sociology. Three hours. Lewis.

**209 Small Groups** Examination of the structure and dynamics of small groups and the interpersonal, informal network of relations that characterize the interaction of members. *Prerequisite:* Six hours of sociology. Three hours. Nixon.

**211 Social Movements and Collective Behavior** Examination of origins, development, structure, and consequences of crowds, riots, crazes, rumors, panics, and political and religious movements and their relationships to cultural and social change. *Prerequisite:* Six hours of sociology. Three hours. Berkowitz, Danigelis, Schmidt.

**214 Delinquency** Analysis of the nature and types of juvenile behavior that violates law, the mechanisms for defining such behaviors as delinquent, and their causes and consequences. *Prerequisite:* Six hours of sociology. Three hours. Fishman, Folta.

**216 Criminal Justice** Analysis of the social structures and processes involved in the identification and labeling of individuals as criminal offenders: criminal law, its enforcement and the courts. *Prerequisite:* Six hours of sociology. Three hours. Fishman, Folta, McCann, Stanfield.

**217 Corrections** Analysis of the social structures and processes involved with individuals designated as offenders of criminal law: probation, prison, parole, and programs of prevention and rehabilitation. *Prerequisite:* Six hours of sociology. Three hours. Fishman, Stanfield.

**219 Race Relations** Examination of American racial subordination in social and historical perspective. Analysis of interracial contacts, racial subcultures and social structures, and responses to racial prejudice and discrimination. *Prerequisite:* Six hours of sociology. Three hours. Danigelis, Loewen.

**220 Internship in Gerontology** Supervised service or research internship integrating theoretical and practical gerontological issues. *Prerequisites:* 20, 120, 221 or 222; or equivalent gerontological preparation. Three hours. Cutler. (Not offered for graduate credit.)

**221 Aging and Social Change** Examines effects of social changes on older persons and on the aging process. Also analyzes how an increasing proportion of older persons in the population leads to social change. *Prerequisites:* Six hours of sociology. Three hours. Cutler.

**222 Aging and Ethical Issues** Analysis of selected ethical issues posed by an aging society and faced by older persons, their families, health care and service providers, and researchers. *Prerequisites:* Six hours of sociology. Three hours. Cutler.

**225 Organizations in Modern Society** Examination of basic classical and contemporary theory and research on the human relations, internal structures, environments, types, and general properties of complex organizations and bureaucracies. *Prerequisite:* Six hours of sociology. Three hours. Berkowitz, Finney, Sampson.

**228 Organizational Development and Change** Examination of basic and applied research on problems of organizational effectiveness and innovation. Includes presentation of organizational development and change techniques and practical class exercises. *Prerequisite:* Six hours of sociology, or one

college course on organizations, or equivalent organizational experience with permission of instructor. Three hours. Berkowitz, Finney.

**229 The Family As a Social Institution** Examination of the institution of the American family in cross-cultural and historical perspective. Theories and research on family continuity, change, and institutional relationships explored. *Prerequisite:* 129 or six hours of sociology. Three hours. Fengler.

**232 Social Class and Mobility** Comparative and historical analysis of causes, forms, and consequences of structured social inequality in societies. Examination of selected problems in contemporary stratification theory and research. *Prerequisite:* Six hours of sociology. Three hours. Danigelis, Finney, McCann, Mintz, Sampson, Schmidt.

**237 Occupations and Professions** Analysis of social organization of economic roles in industrial societies, the institutional relationships of occupations and professions, and impact of work structure on the individual. *Prerequisite:* Six hours of sociology. Three hours. Finney, Folta, Mintz.

**240 Political Sociology** Examination of the social organization of power and authority in modern societies and the dynamics and institutional relationships of political institutions, interest groups, parties, and publics. *Prerequisite:* Six hours of sociology. Three hours. Berkowitz, Danigelis, Loewen, Mintz.

**242 Public Opinion: Theory and Research** (Same as Political Science 285.)\* Examination of theories of public opinion. Topics include: attitude formation and change, political ideology, alienation and allegiance, political socialization, tolerance, and political extremism. *Prerequisite:* 241 (Political Science 284) or permission of instructor. Three hours. Sampson.

\*Credit not given for both 241 and Political Science 284 or for both 242 and Political Science 285.

**243 Mass Media in Modern Society** Intensive examination of selected topics in the structure of media organizations and their relationships to and impacts upon the major institutions and publics of contemporary society. *Prerequisite:* Six hours of sociology. Three hours. Lewis.

**254 Sociology of Health and Medicine** The social organization and institutional relationships of medicine in society and the role of sociocultural factors in the etiology, definition, identification, and treatment of illness. *Prerequisite:* Six hours of sociology. Three hours. Berkowitz, Folta.

**255 Sociology of Mental Health** Analysis of the social structures and processes involved in the identification, definition, and treatment of mental illness and its sociocultural etiology and consequences. *Prerequisite:* Six hours of sociology. Three hours. Folta.

**258 Sociology of Law** Analysis of the sociocultural structure of the legal institution and its relationships to other institutions: the social organization of the legal profession, lawmaking, and the courts. *Prerequisite:* Six hours of sociology. Three hours. Folta, Stanfield.

**274 Research Seminar** Principles of research design, data gathering, ethics, measurement, data analysis, and data presentation. Students will complete a research project. *Prerequisites:* 100 or equivalent with permission of instructor. Three hours. Danigelis, Finney, Folta, Loewen, Schmidt.

**275 Methods of Data Analysis in Social Research** Quantitative analysis of sociological data; includes table, regression, and path analysis, scaling and factor analysis, and the analysis of variance emphasizing multivariate techniques. *Prerequisite:* 100 or equivalent with permission of instructor. Three hours. Berkowitz, Danigelis, McCann.

**278 The Development of Sociological Theory** Major classical traditions in sociological theory and their contemporary research relevance. Includes detailed critical examination of the contributions of Marx, Spencer, Durkheim, Weber,

Simmel, Pareto, and Mead. *Prerequisite:* Six hours of sociology or equivalent preparation in another social science with permission of instructor. Three hours. Loewen, McCann, Sampson, Schmidt.

**281, 282 Seminar** Presentation and discussion of advanced problems in sociological analysis. *Prerequisites:* Twelve hours of sociology, permission of instructor. Three hours.

**285, 286 Internship** *Prerequisites:* Twelve hours of sociology including at least one 200-level course in substantive area relevant to field placement, permission of department.

**288, 289 Seminar: Research and Methods of Teaching Sociology** The development and evaluation of the teaching of sociology. *Prerequisites:* Twelve hours of sociology, permission of department. Open only to students who serve concurrently as teaching assistants in the department. Three hours.

**295, 296 Advanced Special Topics** Advanced courses or seminars on topics beyond the scope of existing departmental offerings. See Schedule of Courses for specific titles.

**297, 298 Readings and Research**

## Statistics (STAT)

COLLEGE OF ENGINEERING AND MATHEMATICS

*Statistics Program Steering Committee: Professors Ashikaga, Howell, McCrorey; Associate Professors Costanza (Acting Director), Gordon, Haugh, Newton; Research Associate Professors Aleong, McAuliffe; Assistant Professors Hamdy, Mickey, Son; Research Assistant Professor Fenwick; Lecturers Badger, Low, MacPherson, Weaver.*

**11 Introduction to Statistics via Microcomputers** Survey of statistical applications. Data descriptive and analytic techniques explored using microcomputer statistical packages applied to illustrative data sets. No computer programming experience required. *Prerequisite:* High school algebra. Three hours.

**51 Discrete Probability Models** Introduction to probability emphasizing models of real world phenomena (e.g. genetics, screening for diseases, birth and death processes). *Prerequisite:* Two years of high school algebra. Three hours. No credit for sophomores, juniors, or seniors in the mathematical and engineering sciences.

**95 Topics in Statistics** Lectures, reports, and directed readings at an introductory level. *Prerequisite:* As listed in course schedule. One to three hours as announced.

**111 Elements of Statistics\*** Basic statistical concepts, methods, and applications; includes correlation, regression, confidence intervals, and hypothesis tests. *Prerequisites:* Two years of high school algebra, sophomore standing. Three hours.

**141 Basic Statistical Methods\*** Introductory methods course for students planning to take additional statistics courses or quantitative courses in their respective fields. Development of working knowledge and calculational skills for statistical description, estimation, and hypothesis testing. *Prerequisites:* Math. 19 or 21, sophomore standing. Three hours.

\*A student may receive credit for only one of 111 and 141, unless special permission has been given by the Statistics Program.

**151 Applied Probability** Introduction to the classical discrete and continuous distributions. Illustrated by applications from engineering, biological, and social sciences. *Prerequisites:* Math. 20 with instructor permission or Math. 22. Three hours.

**191 Special Projects** Student-designed special project under supervision of a staff member culminating in a report. *Prerequisites:* Junior standing, permission of Program Director. One to four hours as arranged.

**195 Special Topics For Undergraduate Students** Lectures, reports, and directed readings. *Prerequisite:* As listed in course schedule. One to three hours as arranged.

**200 Medical Biostatistics** (Same as Biostatistics 200.) Concepts of prevalence, incidence, and risk as well as retrospective and prospective designs and analysis methods appropriate to health science applications. *Corequisite:* 211. Three hours.

**201 Statistical Analysis Via Computer** Intensive coverage of computer-based data processing and analysis using statistical packages, subroutine libraries, and user-supplied programs. Students analyze real data and prepare a comprehensive report. *Prerequisites:* 111 with permission of Director, or 141, or corequisite 211. Three hours.

**211 Statistical Methods I** Fundamental ideas and techniques for applied data analysis and experimental design. Descriptive and inferential statistics, including student's *t*-tests, regression, correlation, and analysis of variance. *Prerequisites:* Junior standing, college algebra. Three hours.

**221 Statistical Methods II** Experimental designs, multifactor analysis of variance, multiple regression and correlation, analysis of covariance, and nonparametric procedures. Data analyzed using selected statistical computer programs. *Prerequisites:* 141 with instructor permission or any one of 211, 241, or 261; junior standing. Three hours.

**223 Applied Multivariate Analysis** Analysis methods for categorical and continuous multivariate data: measures of association, loglinear models, discriminant analysis, principal components, and factor analysis. Selected statistical computer programs utilized. *Prerequisites:* Any one of 211, 241, or 261, or 141 with instructor permission. Math. 124 recommended. Some computer experience desirable. Three hours.

**224 Statistics for Quality and Productivity** Statistical methods for product quality and productivity. Statistical process control. Shewhart, CUSUM, empirical Bayes control charts. Acceptance, continuous, sequential sampling. Selected statistical computer programs utilized. *Prerequisites:* Any one of 211, 241, or 261, or 141 with instructor permission. Some computer experience desirable. Three hours.

**225 Applied Regression Analysis** Simple linear and multiple regression models; least squares estimates, correlation, prediction, forecasting. Problems of multicollinearity and influential data (outliers). Selected statistical computer programs utilized. *Prerequisites:* Any one of 111, 141, 211, 241, or 261. Some computer experience desirable. Three hours.

**227 Statistical Methods for the Behavioral Sciences** (Same as Psychology 341.) *Prerequisite:* 211 with computer experience or Psychology 340.

**229 Reliability and Survival Analysis** Probabilistic modeling and inference in reliability. Replacement, maintenance inspection policies. Weibull, lognormal analyses. Accelerated life tests. Regression analyses with survival data; proportional hazards. Computer applications. *Prerequisites:* Any one of 211, 241, 261, or 141 plus a second statistics course; Math. 121. Statistics 151 recommended. Some computer experience desirable. Three hours.

**231 Experimental Design** Basic experimental designs, complete and incomplete blocking, factorial designs; response surface methods, fixed and random effects models. *Prerequisite:* Any one of 141, 211, 241, or 261. Three hours.

**233 Design of Sample Surveys** Methods of designing and analyzing survey investigations. Simple random, stratified, systematic, cluster/multistage, multiphase sampling. Questionnaire construction, item/scale reliability; estimation methods; sampling frame construction. *Prerequisites:* Any one of 211, 241, or 261, or 141 with instructor permission. Three hours.

**241 Introduction to Statistical Inference** Introduction to statistical theory: parameter estimation, hypothesis testing, chi-square tests, regression analysis, and analysis of

variance. *Prerequisites:* 151 or 251 and a course in statistical methods recommended; Math. 121. Three hours.

**251 Probability Theory** (Same as Math. 207.) Distributions of random variables and functions of random variables. Expectations, stochastic independence, sampling and limiting distributions (central limit theorems). Concepts of random number generation. *Prerequisite:* Math. 121, Statistics 151 recommended. Three hours.

**252a Applied Discrete Stochastic Process Models** Markov chain models for biological, social, and behavioral systems models. Random walks, transition and steady-state probabilities, passage and recurrence times. *Prerequisite:* 151 or 251. One hour.

**252b Applied Continuous Stochastic Process Models** Queueing models for operations research and computer science systems analysis. Birth-and-death processes with applications. Exponential, Erlang, and Poisson distributions. Monte Carlo simulation. *Prerequisite:* 151 or 251. One hour.

**253 Applied Time Series and Forecasting** Autoregressive moving average (Box-Jenkins) models, autocorrelation, partial correlation, differencing for nonstationarity, computer modeling. Forecasting, seasonal or cyclic variation, transfer function and intervention analysis, spectral analysis. *Prerequisite:* Any one of 141, 211, 225, 241, or 261. Some computer experience desirable. Three hours.

**261, 262 Statistical Theory I, II** Point and interval estimation, hypothesis testing, and decision theory. Application of general statistical principles to areas such as nonparametric tests, sequential analysis, and linear models. *Prerequisites:* For 261: 151 with instructor permission or 251; for 262: 241 with instructor permission or 261. Three hours each.

**281 Statistics Practicum** Intensive experience in carrying out a complete statistical analysis for research project in substantive area with close consultation with project investigator. *Prerequisites:* One year of statistics, elementary computer programming. No credit for graduate students in Statistics or Biostatistics. One to four hours.

**293, 294 Undergraduate Honors Thesis** A program of reading, research, design, and analysis culminating in a written thesis and oral defense. Honors notation appears on transcript and Commencement Program. Contact Statistics Program Director for procedures. Six to eight hours.

**295 Special Topics in Statistics** For advanced students. Lectures, reports, and directed readings on advanced topics. *Prerequisite:* As listed in course schedule. One to four hours as arranged.

## Technology (TECH)

### DIVISION OF ENGINEERING, MATHEMATICS, AND BUSINESS ADMINISTRATION

**80 Systems Modeling (3-0)** Computer modeling of business, industrial, social, and engineering systems. *Prerequisite:* Computer Science 11. Three hours.

**185 Senior Project (0-9)** Individual management engineering study designed to the particular interest of the student, utilizing and synthesizing the student's total management engineering education experience. *Prerequisite:* Senior standing in EMBA. Three hours.

**201 System Dynamics Seminar (0-3)** Review of system dynamics literature. Detailed study of conceptualization, paradigms, generic structures, validation, and implementation. Term project and paper in field of interest of student required. *Prerequisite:* 80. Three hours.

## Theatre (THE)

### COLLEGE OF ARTS AND SCIENCES

*Professors Bryan, Feidner; Associate Professors Schenk (Chairperson), Snider; Assistant Professor Thaler; Lecturers Ross, Sypher.*

**1 Introduction to Theatre** Description of the operation of contemporary American theatre, overview of dramatic analysis, and introduction to European and American theatre history. Three hours. I, II.

**5 Oral Interpretation of Literature** Performance of literature that is traditionally nondramatic. Three hours. I, II.

**10 Acting** Development of basic vocabulary and skills necessary for effective acting. Students learn to: relax the body, concentrate attention, focus energies; control and increase body and vocal flexibility; develop inherent histrionic sensibility and imagination. Three hours. I, II. Williams.

**15 Stagecraft** Scenic elements of play production; analysis of theatre forms, study and application of basic elements of scenery construction. Three hours and lab. I, II. Schenk.

**40 Fundamentals of Stage Costuming** Primary course in area of costume design and construction. Three hours. I. Thaler. Offered fall semester only.

**41 History of Costume** Overview of period costume and its adaptation for the stage. Three hours. I. Thaler. Offered fall semester only.

**105 Oral Interpretation of Literature** *Prerequisites:* 1, 5. Three hours. I, II. May be repeated up to nine credit hours.

**110 Advanced Acting.** *Prerequisite:* 10. Three hours. I, II. May be repeated up to nine credit hours. Williams.

**115 Basic Scene Design** Fundamental principles of scenic design, history, and practice. *Prerequisites:* 1, 15. Three hours. I. Schenk.

**120 Stage Lighting** Practice and theory in the illumination of stage productions and the creation of aesthetic effects. *Prerequisite:* 1. Three hours. II. Schenk.

**135 Dramatic Analysis: Form** Examination of structural characteristics of the basic forms of drama and the manner in which they affect theatrical representation. *Prerequisites:* 1, three additional hours in theatre. Three hours. I, 1989-90. Bryan.

**136 Classical and Medieval Theatre** A study of the earliest dramatic rituals, the stage conventions of classical Greece, Rome, and the Middle Ages. *Prerequisites:* 1, 135. Three hours. Bryan.

**137 Renaissance, Baroque, and Neo-Classical Theatre** An examination of the theatrical and dramatic innovations of the 16th, 17th, and 18th centuries. *Prerequisite:* 136. Three hours. Bryan.

**138 19th and 20th Century Theatre** Backgrounds, theatrical conventions, and dramas representative of Romanticism, Realism, and the revolts against Realism. *Prerequisites:* 137. Three hours. Bryan.

**140 Stage Costume Design** Elements, principles, and styles of design applied to the visual creation of a dramatic character. *Prerequisites:* 1, 40; 41 highly recommended. Three hours. I. Thaler. Offered spring semester only.

### 193, 194 College Honors

**195, 196 Intermediate Special Topics** Intermediate courses or seminars on topics beyond the scope of existing departmental offerings. See Schedule of Courses for specific titles.

### 197, 198 Readings and Research

**215 Advanced Scene Design** Analysis of the drama from the standpoint of its visual creation upon the stage; audience-stage relationships, styles of production. *Prerequisites:* 115, 120. Three hours. Schenk. (Not offered for graduate credit.)

**229 Moliere** (Same as French 247.) All course work conducted in French. (Not offered for graduate credit in Theatre.)

**243 Repertory Theatre Operation** *Prerequisite:* Permission. Summer only. (Not offered for graduate credit.)

**250 Play Directing** *Prerequisite:* Six hours, including 1 and permission. Three hours. I, II. Feidner. (Not offered for graduate credit.)

**283, 284 Seminar** (Not offered for graduate credit.)

**297, 298 Senior Reading and Research** (Not offered for graduate credit.)

## SPEECH (SPCH)

*Speech credits will not count toward a Theatre major.*

**11 Effective Speaking** Fundamentals course in effective informative and persuasive public speaking and critical listening. Includes theory and practice. Three hours. I, II. McKenzie, Ross, Roth, Sypher.

**111 Persuasion** Human motivation, attitudes, emotion, stereotypes, attention and audience psychology as applied in the speaking situation. *Prerequisite:* 11. Three hours. Snider.

**112 Argument and Decision** Inductive, deductive, causal, and analogical reasoning as applied to the speaking situation. *Prerequisite:* 11. Three hours. Snider.

**214 Issues in Public Address** Each semester emphasizes analysis of specific speakers, movements, theses, and strategies encompassed by a selected topic of public address. *Prerequisite:* Nine hours of related courses, of which three must be at the 100 level. Three hours. Snider.

**283, 284 Seminar** Seminar topics include: Nonverbal Communication, Rhetorical Criticism, Advanced Argumentation, Advanced Persuasion, Debate, Interpersonal Communication in Group Interaction, Communication in Conflict Management. *Prerequisite:* Six hours of speech, of which at least three hours must be at the 100 level. Three hours. Snider.

## Vocational Education and Technology (VOTC)

### COLLEGE OF AGRICULTURE AND LIFE SCIENCES

*Professors Chamberlain, Fuller; Associate Professors Bloom, Ferreira, Kelly; Extension Associate Professors Harris, Patterson (Chairperson), Wells.*

### AGRICULTURAL TECHNOLOGY AND INDUSTRIAL EDUCATION

**1 Architectural Drafting and Printreading (2-4)** Principles and procedures of technical graphics including orthographic, pictorial, and auxiliary views. Drafting as the universal language of industry. Introduction to architectural drawing. Three hours. Ferreira.

**2 General Shop and Small Engine Mechanics (1-4)** Materials, procedures, hand and power tools commonly used in general woodworking and metalworking. Selection, operation, maintenance, and minor repair of small-engine powered equipment. Three hours. Ferreira.

**6 Energy Alternatives (3-0)** Concepts of energy, work, and power. Energy conversion, utilization, and conservation. Alternatives to fossil fuels including solar, wind, biomass, etc. Energy systems for rural areas. Three hours.

**10 Automobile Basics (3-0)** Basic course in automobile mechanics, management, ownership, and operation. Society related issues such as energy, pollution, and safety also discussed. Three hours.

**20 Metalworking Technology (2-2)** Common methods, processes, materials, and equipment employed in trans-

forming dimensional metals into useful products. Three hours. Ferreira.

**30 Woodworking Technology (2-2)** Common methods, processes, materials, and equipment employed in transforming wood into useful products. Three hours. Ferreira.

**35 Welding and Metal Fabrication (2-2)** Oxyacetylene, electric arc, MIG and TIG welding and the machinery, tools, and processes utilized to transform dimensional metals into useful products. Three hours. Ferreira.

**85 Microcomputer Applications in Agriculture and Life Sciences** Use of microcomputers and application software for computations, word and data processing, problem solving, and telecommunications related to the agricultural and life sciences. Three hours. Wells.

**110 Entrepreneurial Industrial Production (1-4)** Principles, concepts, methods employed in organizing capital, labor, tools, machines for producing products. Students function as labor source and mass produce and market a product. *Prerequisites:* 30 or 35, or Agricultural and Resource Economics 166, or permission of instructor. Three hours. Bloom, Ferreira.

**121 Drainage and Irrigation Systems (2-0)** Small watershed hydrology; water control structures; small pond design; drainage systems design; sprinkler and trickle irrigation. *Prerequisite:* Math. 10. Two hours. Wells.

**131 Light Frame Buildings (3-0)** Site planning, building planning, material selection. Functional and structural considerations including heating, ventilating, and insulation. Consideration of environmental relationships. *Prerequisite:* 6 or Math. 9 or 10. Three hours. Ferreira.

**132 Building Construction Laboratory (0-2)** Principles and practices in rough and finish carpentry, masonry, roofing, and other construction skills. *Prerequisite:* 131 or concurrent. One hour.

**141 Mobile Power Equipment Laboratory (0-2)** Shop procedures for repair and service of engines, hydraulics, power trains, and other components of mobile power equipment. *Prerequisite:* 10 or concurrent enrollment. One hour.

**145 Machinery Management (2-2)** Principles of selection, operation, adjustment, replacement, preventive maintenance, and management of agricultural and industrial machinery based on optimum economical performance. *Prerequisites:* 6, Math. 9, or permission of instructor. Three hours.

**162 Building Utility Systems (2-2)** Wiring systems and applications of electricity, water sources and systems, sewage disposal for agriculture, residences, recreation, and rural development with environmental considerations. *Prerequisites:* 6 or Math. 9 or 10, or permission of instructor. Three hours. Ferreira.

**165 Applied Electronics** Electronic circuits, controls, and instrumentation. Introduction to robotics. *Prerequisites:* 6 or 162 or Physics 12 or permission. Three hours.

**170 Solar Energy Applications** Passive, active, and hybrid heating; photovoltaic electric systems. Physical principles, site evaluation, component and system analysis, materials selection, and design of low-cost systems. *Prerequisite:* Math. 10 or equivalent. Three hours. Wells.

## OCCUPATIONAL AND EXTENSION EDUCATION

**52 Introduction to Occupational and Home Economics Education Careers (3-0)** Principles and philosophies of occupational and home economics education. Career exploration provided through 30 hours of observation and participation in actual school settings. Three hours. Chamberlain, Fuller.

**53, 54 Teaching Internship in Occupational and Home Economics Education** Teaching under guidance of college supervisor, and seminars. For newly-employed teachers who have not completed a formal teaching practicum. *Pre-*

*requisites:* Employment as a teacher in an appropriate subject, permission of department. Two hours each. Through Continuing Education. Bloom, Chamberlain, Fuller.

**82 Exploring Careers in Adult and Extension Education (3-0)** Introduction to adult and extension education techniques. Career exploration provided through 30 hours of observation and participation in actual adult and extension education programs. Three hours. Kelly, Patterson.

**151 Methods and Procedures in Occupational and Home Economics Education (3-0)** Three modules of five weeks' duration. Laboratory management, multimedia techniques, youth organizations, and advisory councils, managing the home economics education program. May enroll for total of three hours. *Prerequisite:* 52. One hour for each module. Chamberlain, Fuller, Harris.

**152 Methods and Procedures in Occupational and Home Economics Education (3-0)** Three modules of five weeks' duration. Curriculum development, instructional planning, teaching methods, micro-teaching, and test construction. *Prerequisite:* 151. One hour for each module. May enroll for total of three hours. Bloom, Chamberlain, Fuller.

**155 Teaching Practicum in Occupational and Home Economics Education** Teaching in elementary or secondary schools under guidance of cooperating teacher and college supervisors. Usually a full-time, 16-week experience. *Prerequisites:* 152, acceptance into teacher education. Variable credit, nine to 15 hours. Bloom, Chamberlain, Fuller, Harris.

**157 Organizing and Managing Occupational Education Laboratories (3-0)** Offered through Continuing Education upon request.

**158 Evaluating Achievement in Occupationally-Oriented Education (3-0)** Offered through Continuing Education upon request.

**159 Developing Courses for Occupational Education (3-0)** Offered through Continuing Education upon request.

**182 Leadership Preparation (3-0)** Methods for educators, officers of organizations, and members of groups to improve their leadership ability. Includes group and independent study, observation, and practice. *Prerequisite:* 52 or 82 or permission. Three hours. Patterson.

**183 Communication Methods (3-0)** Presentation of information through the media of press, radio, television, and audiovisual techniques. *Prerequisite:* 52 or 82 or permission of instructor. Three hours. Chamberlain.

**184 Adult and Extension Education Experience (3-0)** Field work to provide experience in adult or extension education. Supervised jointly by adult educators or extension faculty and department faculty. May enroll more than once. *Prerequisite:* 183 or permission of instructor. Variable credit, three to 12 hours. Fuller, Patterson.

**251 Media, Methods, and Materials for Teaching Home Economics** Advantages, disadvantages, guidelines for using, and development of media, materials, and methods for teaching in a variety of home economics-related programs. *Prerequisite:* 52 or permission of instructor. Three hours. Chamberlain.

**252 Evaluation in Home Economics, Occupational, and Extension Education** Test and questionnaire construction and nontesting means of evaluation, usability, validity, reliability, and discrimination of evaluation instruments. Selected sociometric techniques and evaluation in affective domain. *Prerequisite:* 251 or permission of instructor. Three hours. Chamberlain.

**253 Curriculum Development in Home Economics, Occupational, and Extension Education** Basic principles of curriculum development applied to vocational education. Unique characteristics and contributions of vocational education as related to educational, economic, and sociological



trends. *Prerequisite:* Nine hours in education or permission of instructor. Three hours. Chamberlain, Bloom.

**270 Educating Students With Special Needs In Vocational Education (3-0)** Legal, social, and economic forces affecting vocational programming for special needs students. Various programs, resources, and procedures for educating special learners in vocational education. *Prerequisite:* Admission to an approved teacher certification program or permission of instructor. Three hours.

**271 Workshop in Teaching Students With Special Needs in Vocational Settings** Intensive preparation in selecting contemporary instructional strategies and materials, adapting and using equipment in regular and special vocational education programs. *Prerequisite:* Completion of 12 credits in vocational or special education at the 100 or 200 level or permission. Offered during summer sessions. Variable credit, one to three hours; may enroll more than once up to six credits.

**273 Technical Writing** Through readings and regular writing assignments, students will learn the rhetorical art of technical writing essential for scientists and engineers. Focus is on form and content. (Fall semester for students with research data; spring semester for undergraduates and new graduate students.) Three hours. Donnellan.

**275 Developing Vocational Instruction for Students With Special Needs (3-0)** Development of instructional strategies for including handicapped students in vocational education. Procedures for developing, implementing, and evaluating individualized vocational plans. *Prerequisite:* Admission to an approved teacher certification program or permission of instructor. Three hours.

**283 Teaching Adults** Problems related to organizing and planning adult education programs for schools, community organizations, government agencies, or business. Techniques for teaching adults analyzed. *Prerequisites:* Senior standing, 82 or 52 and 182, or permission of instructor. Three hours. Kelly, Patterson.

For additional education offerings, see pages 129-138.

#### SPECIAL STUDY AND RESEARCH

**150 Technical Internship** Planned, supervised, off-campus work experience. Technical theory plus practical application in field experiences. May enroll more than once up to 30 hours. Employment coordinated through University Cooperative Education Program may qualify for credit. *Prerequisites:* Voc. Ed. majors—52, admission to teacher education, permission of instructor; Agr. Tech. majors—12 hours VOTC, permission of instructor. Credit as arranged. Summer. I, II.

**197 Special Problems** Individual investigation of a problem selected to meet special needs of students. May enroll more than once up to six hours. *Prerequisites:* Six hours, departmental permission. Credit as arranged. Summer. I, II.

**199 Senior Technology Laboratory** Utilizing and synthesizing the total technology educational experience to formulate and solve practical problems under guidance of a faculty member. *Prerequisites:* Twelve hours VOTC at 100 level, department permission. One to three hours. Summer. I, II.

**292 Seminar** Reports, discussions, and investigations in selected fields. May enroll more than once up to six hours. *Prerequisites:* Six hours VOTC at 100 level, permission of instructor. One to three hours. I, II.

**295 Special Topics** Lectures, laboratories, and/or readings and reports to provide background and specialized knowledge relating to contemporary areas of study. May enroll more than once up to nine hours. *Prerequisites:* Senior standing, six hours 100 level, departmental permission. Credit as arranged. Summer. I, II.

## Wildlife and Fisheries Biology (WFB)

### SCHOOL OF NATURAL RESOURCES

*Associate Professors Capen, Hirth (Program Chair), LaBar, Assistant Professor Fuller.*

**74 Wildlife Conservation** Historical and contemporary values of wildlife; impacts on habitats and populations; strategies for conservation, allocation, and use. *Prerequisite:* Basic understanding of biological terms and concepts. Three hours. Fuller.

**130 Ornithology** Taxonomy, classification, identification, morphology, physiology, behavior, and ecology of birds. *Prerequisites:* Biology 1, 2 or equivalent. Three hours. Capen.

**131 Field Ornithology** Identification and field studies of birds, emphasizing resident species. *Prerequisite:* 130; preference to WFB majors. Two hours. Capen.

**150 Wildlife Habitat and Population Measurements** Field methods for measuring habitat variables and estimating population parameters. Two weeks in summer. *Prerequisites:* 131, Forestry 21 or Botany 109, Statistics 141. Two hours. Hirth.

**161 Fisheries Biology** Detailed life histories of major sport and forage fish species. Overview of traditional and contemporary fishery management principles and practices including censusing, sampling of fish populations, and determination of parameters necessary for intelligent management of fish stocks. *Prerequisites:* Biology 1, 2 or equivalent. Four hours. LaBar.

**165 Endangered Species Management** Ecological and political management of endangered vertebrates in North America; recovery efforts for selected species. *Prerequisites:* 74 or 174, junior standing. Three hours.

**174 Principles of Wildlife Management** Plant and animal ecology applied to management of wildlife populations; properties of species, populations, and habitats; consideration of game, nongame, and endangered species. *Prerequisites:* Biology 1, 2 or equivalent; an ecology course or concurrent enrollment. Three hours. Capen.

**176 Florida Ecology Field Trip** Major ecosystems and associated wildlife, ranging from north Florida flatwoods to south Florida Everglades. Field trip over spring recess. *Prerequisites:* 130, 174; permission. Two hours. Hirth. Alternate years, 1988-89.

#### 185, 186 Special Topics

**187, 188 Undergraduate Special Projects** Individual projects supervised by a faculty member. Projects may involve independent field, laboratory, or library investigations. Formal report required. *Prerequisites:* Junior standing, submission of a project prospectus for permission. One to five hours.

**191 Wildlife and Fisheries Practicum** Supervised work experience in the wildlife and fisheries area. *Prerequisite:* Permission of instructor. Credit as arranged.

**232 Ichthyology** Biology of fishes. Study of the structure and function of systems; behavior and ecology of modern fishes. *Prerequisites:* Zoology 104 or 219 or equivalent. Three hours. LaBar. Alternate years, 1988-89.

**251 Wildlife Habitat and Population Analysis** Management, analyses, and interpretation of animal census and survey data; home range analyses; population modeling; habitat evaluation, classification, and preference analysis. *Prerequisites:* 150, Statistics 141. Three hours. Capen.

**271 Wetlands Ecology and Marsh Management** Structure and dynamics of natural and manmade marsh systems; emphasis on applied ecology, freshwater habitats, and their wildlife populations. *Prerequisite:* 174 or permission. Three hours. Fuller.

**272 Wetlands Ecology and Marsh Management Laboratory** Qualitative and quantitative assessment of

marsh habitats and wildlife populations, emphasizing management of waterfowl and furbearers. Technical paper required. One weekend trip. *Prerequisites:* 150; previous or concurrent enrollment in 271. One hour. Fuller.

**273 Uplands Wildlife Ecology** Integration of ecological principles, wildlife biology, land use, and human dimensions in wildlife. Emphasis on development and maintenance of wildlife habitat, and population regulation of upland species. *Prerequisites:* 150, 174. Three hours. Hirth.

**274 Uplands Wildlife Ecology Laboratory** Laboratory and field experience related to upland species and management of their habitat. Field project required. *Prerequisite:* Previous or concurrent enrollment in 273. One hour. Hirth.

**275 Wildlife Behavior** Behavior and social organization of game and nongame species as they pertain to population management. *Prerequisites:* One year of biology, an ecology course, 74 or 174 recommended. Three hours. Hirth.

**281, 282 Wildlife Seminar** A topical seminar in contemporary issues of fish and wildlife conservation presented by students, faculty, and visiting personnel. Permission. One hour. (Not offered for graduate credit.)

### 285, 286 Advanced Special Topics

**287, 288 Advanced Special Projects** Advanced readings and discussions or special field and/or laboratory investigations dealing with a topic beyond the scope of existing formal courses. *Prerequisite:* Senior standing or permission. Credit arranged. (Not offered for graduate credit.)

## Zoology (ZOOL)

### COLLEGE OF ARTS AND SCIENCES

*Professors Bell, Happ (Chairperson), Heinrich, Henson, Potash; Associate Professors Davison, Herbers, Kilpatrick, Landesman, Schall, Stevens, VanHouten, Wilson; Assistant Professor Otter; Research Assistant Professor Ostell; Adjunct Assistant Professor Jillson.*

### BIOLOGY (BIOL)

**1, 2 Principles of Biology (3-3)** Introduction to structure, functions, and evolution of animals and plants. Concepts important for advanced study in a life science and for understanding the biological world.<sup>1</sup>

**3 Biology and Man** For nonscience majors. Selected biological topics relevant to man, such as cancer, human genetics, environmental toxicants; biological concepts necessary for understanding these problems. Three hours. Landesman.<sup>1,2</sup>

**7 Biological Aspects of Environmental Problems** The harmful biological impact of air and water pollutants; their physiological, genetic, and ecological action on plants and animals, particularly humans. Three hours. II. Potash.<sup>1,2</sup>

**101 Genetics** Study of the basis of inheritance, covering topics from classical genetics to modern molecular studies. Analysis of genetic data emphasized. *Prerequisites:* 1, 2; organic chemistry recommended. Three hours. II. Van Houten.

**102 Environmental Biology (3-3)** Ecosystem and community structure; population growth; species interactions and niche dynamics; population and chromosomal genetics; speciation in fossil records; ecology of animal behavior; applied ecology. *Prerequisites:* 1, 2; Math. 19 or 21. Four hours. I. Schall.

**103 Cell Structure and Function (3-3)** Structure and physiology of cells, emphasizing basic features common to all forms of life. *Prerequisites:* 1, 2, chemistry. Four hours. Happ.

**203 Population Ecology** Analysis of growth, regulation, and interrelations of biological populations in theoretical, laboratory, and natural systems. *Prerequisite:* Biology 102.

Three hours. II. Schall. Not offered, 1988-89.

**205 Advanced Genetics Laboratory** Lecture/discussions alternated with laboratories to provide experiences with genetic techniques. Bench work and data analysis emphasized. *Prerequisite:* 101. Four hours. Van Houten.

<sup>1</sup>Credit not given for both courses in each or any of the following combinations: (Biology 1 and Zoology 8), (Biology 1 and Zoology 9), (Biology 1 and Zoology 95), (Biology 1 and Botany 4), (Biology 2 and Botany 4), (Biology 2 and Zoology 9), (Biology 2 and Biology 3), (Biology 2 and Zoology 96).

### ZOOLOGY (ZOOL)

**8 The Animal World** Discussion of animal forms with specific reference to their usefulness in our understanding of general biological processes. Three hours. Davison.<sup>1,2</sup>

**95, 96 Introductory Special Topics** Introductory courses or seminars on topics beyond the scope of existing departmental offerings. See Schedule of Courses for specific titles.<sup>1,2</sup>

**104 Comparative Structure and Function (3-3)** Anatomy and physiology of organs and organ systems in animals emphasizing basic physiology common to all forms. *Prerequisite:* Biology 103. Four hours. Otter.

### 193, 194 College Honors

**195, 196 Intermediate Special Topics** Intermediate courses or seminars on topics beyond the scope of existing departmental offerings. See Schedule of Courses for specific titles.

**197, 198 Undergraduate Research** Individual laboratory research under guidance of faculty member. Students electing Zoology 197 and 198 must follow the guidelines outlined on page 60 or they will be disenrolled. *Prerequisites:* Junior or senior standing, departmental permission. Three or six hours.

**202 Quantitative Biology** Mathematical concepts applied to biological problems such as growth, metabolism, temperature effects, kinetics, and graphic interpretation of data. Statistics not treated. *Prerequisite:* At least one intermediate level course in biology, Math. 9, or permission of instructor. Three hours. I. Davison.

**208 Morphology and Evolution of Insects (2-4)** Interrelationships, fossil history, comparative anatomy of major insect groups. Morphology and way of life of representatives of important insect orders and classes of arthropods. *Prerequisite:* 104 or Biology 102. Four hours. Bell. Not offered 1988-89.

**209 Field Zoology (2-4)** Collection, identification of invertebrates; September field work. Half of student's collection is general, identified to family; half is one or two groups identified to species. *Prerequisite:* 104 or Biology 102. Four hours. Bell. Not offered 1988-89.

**210 Zoogeography** Distribution of natural populations of animals emphasizing theories accounting for discontinuous distribution patterns. *Prerequisites:* Biology 102, or Biology 1, 2 and Geography 216, or equivalent. Three hours. Bell. Not offered 1988-89.

**212 Comparative Histology (2-4)** Anatomy of tissues, chiefly vertebrate. Tissue similarities and specializations of organs among the various groups of animals in relation to function. *Prerequisite:* 104. Four hours. Landesman.

**216 Human Genetics** Inheritance; population genetics; interaction of heredity and environment; application to human problems. *Prerequisite:* Biology 101. Three hours.

**217 Mammalogy (3-3)** Classification, identification, morphology, evolution, and distribution of mammals. *Prerequisite:* Biology 102. Four hours. Kilpatrick.

**219 Comparative and Functional Vertebrate Anatomy (2-4)** Structure, function, and phylogeny; survey of evolutionary and functional trends; investigation of the structure of all chordate groups. *Prerequisite:* 104. Four hours. II. Kilpatrick. Alternate years, 1988-89.

**225 Physiological Ecology (2-4)** Processes by which animals cope with moderate, changing, and extreme environments. *Prerequisites:* Biology 102, 104. Four hours. II. Heinrich.

**231 Cell Physiology** Topics of current interest in the scientific literature. Emphasis on techniques and experimental approaches utilized to derive an understanding of cell structure and function. *Prerequisites:* Biology 103, Chemistry 141, 142, departmental permission. Three hours. Otter. Alternate years, 1989-90.

**236 Limnology (2-4)** The ecology of standing waters: the biota of lakes as related to the geological, physical, and chemical conditions of lakes. *Prerequisites:* Biology 102, introductory chemistry, junior standing. Four hours. I. Henson.

**237 Ecology of Running Waters (2-4)** Stream and river environments, adaptations of organisms to varying physical, chemical, and biotic conditions. *Prerequisites:* Biology 102, introductory chemistry, junior standing. Four hours. Potash.

**240 Invertebrate Ecology of the Mountains** An intensive study of the invertebrate fauna of Camel's Hump and vicinity. *Prerequisite:* Biology 102 or a course in invertebrate or insect taxonomy. Four hours. Bell. Not offered 1988-89.

**244 Comparative Immunology** Introduction to immunobiology, immunogenetics, and immunochemistry; discussion of evolutionary and comparative aspects of the immune system. *Prerequisites:* Biology 101, 103, Zoology 104. Three hours. Stevens.

**250 Invertebrate Zoology (2-4)** Evolutionary survey of the invertebrate phyla and classes from the Protozoa through Chordata. Emphasis on morphology, embryology, and ecology. *Prerequisites:* One 100-level Biology or Zoology or equivalent; or Biology 1 and Geology 121. Four hours. Henson.

**251 Insect Physiology (3-3)** Anatomy and physiology emphasizing growth, reproduction, and sensory physiology. *Prerequisite:* 104 or consent of instructor. Four hours. Happ. Alternate years, 1989-90.

**255 Comparative Animal Physiology (2-6)** General principles of function in invertebrates and vertebrates. *Prerequisites:* 104, Chemistry 141, 142. Four hours. II. Davison.

**262 Physiological Basis of Behavior** Structure and function of neural and hormonal mechanisms involved in animal behavior emphasizing phylogeny. *Prerequisite:* Biology 103 or permission of instructor. Three hours. Stevens.

**263 Genetics of Cell Cycle Regulation** Molecular events during the cell cycle; mutants defective in cell cycling; comparison of normal and transformed (cancer) cell cycling. *Prerequisite:* Biology 101 or permission of instructor. Three hours. VanHouten.

**270 Speciation and Phylogeny** Contributions of modern research in such fields as genetics, systematics, distribution, and serology to problems of evolutionary change. *Prerequisite:* Biology 101 (Biology 102 recommended). Three hours. Kilpatrick. Alternate years, 1988-89.

**271 Advanced Limnology** Analyses of current concepts and problems. *Prerequisite:* 236. Three hours. II. Henson.

**281 through 284 Seminar** Review and discussion of current zoological research. Attendance required of Zoology graduate students. Seniors in zoological research programs may enroll. Without credit.

**295, 296 Advanced Special Topics** Advanced courses or seminars on topics beyond the scope of existing departmental offerings. See Schedule of Courses for specific titles.

*Note:* Biology and Zoology majors will not receive credit for Biology 3, or Biology 7, or Zoology 8, or Zoology 9, or Zoology 95, or Zoology 96.

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*Associate Professor of Medicine*
- Varney, Kenneth, M.S.  
*Assistant Professor of Plant and Soil Science*
- Wallman, Lester J., M.D.  
*Professor of Neurosurgery*
- Weaver, Lelon A., Jr., Ph.D.  
*Associate Professor of Psychology*
- Webster, Fred C., Ph.D.  
*Professor of Agricultural and Resource Economics*
- Webster, Selina M., M.S.  
*Professor of Clothing, Textiles, and Design*
- Webster, Truman M., Ph.D.  
*Professor of German*
- Weed, Lawrence L., M.D.  
*Professor of Medicine*
- Welsh, George W., M.D.  
*Associate Professor of Medicine*
- White, Robert E., B.S.  
*Extension Assistant Professor in Extension Service*
- Whittlesey, Margaret B., M.S.W.  
*Associate Professor of Special Education, Social Work, and Social Services*
- Wiggans, Samuel C., Ph.D.  
*Professor of Plant and Soil Science*
- Williams, Blair, M.S.  
*Professor of Human Nutrition and Foods*
- Wolf, George A., Jr., M.D.  
*Professor of Medicine*
- Wood, Glen M., Ph.D.  
*Professor of Plant and Soil Science*
- Woodruff, William A., L.M.C.C.  
*Associate Professor of Psychiatry*
- Young, William G., M.D.  
*Associate Professor of Psychiatry*
- Zimmerli, Elizabeth K., Ed.D.  
*Associate Professor of Physical Education*

## Faculty

*Dates after names represent the year of appointment, either original or following a lapse of service.*

- Abajian, John C., M.D. (1974)  
*Associate Professor of Anesthesiology*
- Abbott, Donald W., M.D. (1981)  
*Clinical Associate Professor of Family Practice*
- Aboutajily, Georges, M.D. (1982)  
*Clinical Assistant Professor of Surgery*
- Abraham, Frederick D., Ph.D. (1987)  
*Lecturer in Psychology*
- Abrahams, Tod G., M.D. (1986)  
*Clinical Assistant Professor of Radiology*
- Abramson, Leslie S., M.D. (1983)  
*Clinical Assistant Professor of Pediatrics*
- Abruscato, Joseph A., Ph.D. (1969)  
*Professor of Professional Education and Curriculum Development*
- Absher, P. Marlene, Ph.D. (1979)  
*Research Associate Professor of Medicine and Instructor in Medicine*
- Absher, Richard G., Ph.D. (1968)  
*Professor of Electrical Engineering*
- Achenbach, Thomas M., Ph.D. (1979)  
*Professor of Psychiatry and Psychology*
- Adams, David L., M.D. (1981)  
*Clinical Assistant Professor of Medicine*
- Adams, Marvin C., M.D. (1982)  
*Clinical Assistant Professor of Surgery*
- Ades, Philip A., M.D. (1984)  
*Assistant Professor of Medicine*
- Agne, Russell M., Ph.D. (1969)  
*Professor of Professional Education and Curriculum Development*
- Aines, Linda D., M.B.A. (1983)  
*Extension Assistant Professor in Extension Service*
- Ainsworth, Rebecca A., B.S. (1983)  
*Extension Instructor in Extension Service*
- Aitken, Phil A., M.D. (1977)  
*Associate Professor of Ophthalmology*
- Albee, George W., Ph.D. (1971)  
*Professor of Psychology*
- Albertini, Richard J., M.D., Ph.D. (1972)  
*Professor of Medicine, Microbiology, and Pediatrics*
- Alden, Peter D., M.D. (1964)  
*Clinical Associate Professor of Medicine*
- Aleong, John, Ph.D. (1976)  
*Research Associate Professor of Statistics*
- Alexander, Alan R., M.D. (1980)  
*Clinical Assistant Professor of Obstetrics and Gynecology*
- Alexander, James P., M.P.A. (1986)  
*Professor of Military Studies*
- Allan, Walter C., M.D. (1980)  
*Clinical Associate Professor of Pediatrics*
- Allard, William E., Jr., M.D. (1974)  
*Clinical Associate Professor of Medicine and Family Practice*
- Allen, Christopher W., Ph.D. (1967)  
*Professor of Chemistry*
- Allen, Donald E., M.D. (1982)  
*Clinical Assistant Professor of Surgery*
- Allen, Elizabeth F., Ph.D. (1979)  
*Assistant Professor of Pediatrics*
- Allen, Ray H., M.D. (1987)  
*Instructor in Medicine*
- Alnasrawi, Abbas, Ph.D. (1963)  
*Professor of Economics*
- Alpern, Warren D., M.D. (1986)  
*Clinical Instructor in Medicine*
- Alpert, Norman R., Ph.D. (1966)  
*Professor of Physiology and Biophysics*
- Alsofrom, Gary F., M.D. (1988)  
*Assistant Professor of Radiology*
- Alternus, Vaughn L. III, Ph.D. (1987)  
*Assistant Professor of Political Science*
- Altman, Francis M., Jr., M.D. (1984)  
*Assistant Professor of Medicine*
- Ambrose, Jane P., M.A. (1965)  
*Professor of Music*
- Ambrose, Z. Philip, Ph.D. (1962)  
*Professor of Classics*
- Anderson, Larry G., M.D. (1981)  
*Clinical Associate Professor of Medicine*
- Anderson, Richard A., M.D. (1981)  
*Clinical Assistant Professor of Medicine*
- Anderson, Richard L., Ph.D. (1978)  
*Professor of Electrical Engineering*
- Andrea, Alfred J., Ph.D. (1967)  
*Professor of History*
- Andrews, Allan A., Ph.D. (1970)  
*Associate Professor of Religion*
- Andrews, Margaret R., M.S. (1981)  
*Extension Assistant Professor in Extension Service*
- Anger, Christena M., B.A. (1987)  
*Lecturer in Human Development Studies*
- Applebaum, Brett I., M.D. (1987)  
*Clinical Instructor in Radiology*
- Aranson, Albert, M.D. (1981)  
*Professor of Medicine*
- Archdeacon, Dan S., Ph.D. (1982)  
*Associate Professor of Mathematics*
- Ariano, Marjorie A., Ph.D. (1980)  
*Associate Professor of Anatomy and Neurobiology*
- Armstrong, Frank H., Ph.D. (1968)  
*Associate Professor of Natural Resources*
- Arns, Robert G., Ph.D. (1977)  
*Professor of Physics*
- Aronson, Richard A., M.D. (1978)  
*Clinical Assistant Professor of Pediatrics*
- Aschenbach, Walter P. (1959)  
*Lecturer in Art*
- Ashikaga, Takamaru, Ph.D. (1973)  
*Professor of Statistics*
- Ashman, Jay I., J.D. (1982)  
*Lecturer in Merchandising, Consumer Studies, and Design*
- Ashman, Marguerite G., M.A. (1974)  
*Extension Associate Professor in Extension Service*
- Atherton, Henry V., Ph.D. (1953)  
*Professor of Animal Sciences*
- Atherton, Janet E., M.A. (1981)  
*Lecturer in Music*
- Auger, Newell A., Jr., M.D. (1981)  
*Clinical Associate Professor of Medicine*
- Auletta, Frederick J., Ph.D. (1979)  
*Associate Professor of Obstetrics and Gynecology and Biochemistry*
- Avery, Sara E., M.D. (1987)  
*Clinical Assistant Professor of Pediatrics*
- Averyt, William F., Ph.D. (1984)  
*Associate Professor of Business Administration*
- Azar, Massoud, M.D. (1983)  
*Clinical Assistant Professor of Neurology*
- Babbott, David A., M.D. (1967)  
*Professor of Medicine*
- Babbott, Frank L., Jr., M.D. (1963)  
*Clinical Associate Professor of Medicine*
- Bach, Michael C., M.D. (1981)  
*Clinical Associate Professor of Medicine*

- Backus, Robert W., M.D. (1982)  
*Clinical Assistant Professor of Family Practice*
- Bagwell, Sandra P., M.D. (1986)  
*Instructor in Medicine*
- Baker, John D., M.D. (1987)  
*Assistant Professor of Medicine*
- Baker, Nancy E., Ph.D. (1982)  
*Research Assistant Professor of Communication Science and Disorders*
- Baker, Roger D., M.D. (1971)  
*Clinical Instructor in Pediatrics*
- Baldini, Elio, M.D. (1983)  
*Clinical Professor of Anesthesiology*
- Baldwin, Warren C., M.D. (1980)  
*Clinical Assistant Professor of Obstetrics and Gynecology*
- Ball, Karen J., M.S.N. (1984)  
*Lecturer in Radiologic Technology*
- Ballard, Patricia R., B.A. (1982)  
*Clinical Instructor in Medical Technology*
- Bancroft, Robert L., Ph.D. (1981)  
*Assistant Professor of Agricultural and Resource Economics*
- Banerjee, Jayanta K., Ph.D. (1986)  
*Visiting Professor of Mechanical Engineering*
- Barbour, Gary A., Ph.D. (1984)  
*Research Assistant Professor of Electrical Engineering*
- Barbour, James R., Ed.D. (1974)  
*Associate Professor of Human Development Studies*
- Barner, Stephen H., B.S. (1987)  
*Lecturer in Vocational Education and Technology*
- Barnum, H. Gardiner, Ph.D. (1965)  
*Associate Professor of Geography*
- Barrett, John W., M.D. (1982)  
*Clinical Assistant Professor of Orthopaedics and Rehabilitation*
- Barrington, David S., Ph.D. (1974)  
*Associate Professor of Botany*
- Barron, Martin A., Jr., M.D. (1981)  
*Clinical Assistant Professor of Pediatrics*
- Bartel, Lavon L., Ph.D. (1982)  
*Extension Assistant Professor of Nutritional Sciences*
- Barth, Richard A., M.D. (1981)  
*Associate Professor of Radiology*
- Bartlett, Richmond J., Ph.D. (1958)  
*Professor of Plant and Soil Science*
- Bates, Peter W., M.D. (1987)  
*Assistant Professor of Medicine*
- Bates, Thomas C., M.D. (1967)  
*Clinical Associate Professor of Pediatrics*
- Bates, Timothy M., Ph.D. (1974)  
*Professor of Economics*
- Bathgate, Ronald, B.A. (1985)  
*Extension Instructor in Extension Service*
- Battelle, Peter E., M.B.A. (1970)  
*Assistant Professor of Business Administration*
- Battle, Robert W., M.D. (1987)  
*Instructor in Medicine*
- Bauer, Stephen F., M.D. (1980)  
*Clinical Assistant Professor of Pediatrics*
- Beatty, Paul A., Ph.D. (1986)  
*Assistant Professor of Mechanical Engineering*
- Bedard, Louise T. (1970)  
*Clinical Assistant Professor of Medicine*
- Beeken, Warren L., M.D. (1976)  
*Professor of Medicine*
- Belenky, Mary F., Ed.D. (1985)  
*Research Associate Professor of Psychology*
- Belinson, Jerome L., M.D. (1977)  
*Associate Professor of Obstetrics and Gynecology*
- Belisle, Charles M., M.D. (1986)  
*Associate Professor of Family Practice*
- Beliveau, Jean-Guy L., Ph.D. (1985)  
*Associate Professor of Civil Engineering*
- Bell, Paul R., M.D. (1984)  
*Clinical Instructor in Medicine*
- Bell, Ross T., Ph.D. (1955)  
*Professor of Zoology*
- Bell, Roy W., M.B.Ch.B. (1969)  
*Associate Professor of Anesthesiology*
- Bellino, Francis A., M.D. (1981)  
*Clinical Assistant Professor of Family Practice*
- Benay, Elliott M., M.A. (1981)  
*Adjunct Instructor in Psychology*
- Beninati, Lou Ann, M.Ed. (1987)  
*Lecturer in Human Development Studies*
- Bennert, Harry W., Jr., M.D. (1980)  
*Clinical Associate Professor of Obstetrics and Gynecology*
- Bennet, Meredith A., M.D. (1985)  
*Clinical Assistant Professor of Surgery*
- Bennett, Roberta K., M.D. (1987)  
*Clinical Assistant Professor of Neurology*
- Benoit, Linda A., A.S. (1987)  
*Instructor in Radiologic Technology*
- Bergdahl, Dale R., Ph.D. (1977)  
*Associate Professor of Natural Resources*
- Bergner, Arthur, M.D. (1970)  
*Clinical Professor of Medicine*
- Bergner, Renee S., M.D. (1970)  
*Clinical Professor of Pediatrics*
- Berkett, Lorraine P., Ph.D. (1983)  
*Extension Assistant Professor of Plant and Soil Science*
- Berkovich, Sumner, M.D. (1980)  
*Clinical Associate Professor of Pediatrics*
- Berkowitz, Stephen D., Ph.D. (1980)  
*Associate Professor of Sociology*
- Bernstein, Ira M., M.D. (1987)  
*Instructor in Obstetrics and Gynecology*
- Bernstein, Richard A., M.D. (1976)  
*Clinical Associate Professor of Psychiatry*
- Bertocci, Paul V., M.D. (1976)  
*Clinical Assistant Professor of Family Practice*
- Berube, David M., M.A. (1987)  
*Lecturer in Theatre*
- Betts, Douglas H., M.D. (1984)  
*Clinical Assistant Professor of Psychiatry*
- Bevan, John A., M.B., B.S. (1983)  
*Professor of Pharmacology*
- Bevan, Rosemary D., M.B., B.S. (1983)  
*Professor of Pharmacology*
- Bevins, Malcolm I., M.S. (1956)  
*Extension Professor of Agricultural and Resource Economics*
- Bickel, Warren K., Ph.D. (1987)  
*Research Assistant Professor of Psychiatry*
- Biddle, Arthur W., Ph.D. (1970)  
*Assistant Professor of English*
- Bigalow, Charles W., M.S. (1967)  
*Extension Associate Professor in Extension Service*
- Bigelow, James C., Ph.D. (1987)  
*Research Assistant Professor of Pharmacology*
- Bigos, S. Thomas, M.D. (1981)  
*Associate Professor of Medicine*
- Bingham, Richard L., M.S.W. (1975)  
*Clinical Associate Professor of Psychiatry*
- Bittermann, Donald E., M.D. (1981)  
*Clinical Assistant Professor of Radiology*
- Blanch, Andrea K., Ph.D. (1987)  
*Research Assistant Professor of Psychology*
- Blanchard, Edward M., Ph.D. (1985)  
*Research Associate in Physiology and Biophysics*
- Bland, Walter P., B.S. (1977)  
*Lecturer in Human Development Studies*
- Blatt, Frank J., Ph.D. (1987)  
*Visiting Professor of Physics*

- Blattner, Stephen, M.D. (1982)  
*Clinical Assistant Professor of Pediatrics*
- Blattspieler, Carol L., B.S.N. (1988)  
*Clinical Assistant Professor of Orthopaedics and Rehabilitation*
- Blinick, Joseph S., Ph.D. (1981)  
*Clinical Assistant Professor of Radiology*
- Bliss, Harry A., M.D. (1981)  
*Clinical Assistant Professor of Medicine*
- Blomfield, Muriel M., B.S. (1979)  
*Clinical Instructor in Medical Technology*
- Bloom, Thomas K., Ed.D. (1973)  
*Associate Professor of Vocational Education and Technology*
- Blow, Alton J., M.D. (1985)  
*Assistant Professor of Medicine*
- Bludevich, Zafir G., M.Ed. (1987)  
*Adjunct Instructor in Human Development Studies*
- Bodman, Andrew R., Ph.D. (1978)  
*Associate Professor of Geography*
- Boedy, David L., M.S.W. (1979)  
*Clinical Assistant Professor of Psychiatry*
- Bohannon, Jean P., (1981)  
*Clinical Instructor in Radiologic Technology*
- Bokinsky, George E., Jr., M.D. (1984)  
*Assistant Professor of Medicine*
- Bolognani, Betty M., B.S. (1987)  
*Extension Instructor in Extension Service*
- Bonazinga, Bartholomew J., M.D. (1984)  
*Clinical Instructor in Medicine*
- Bond, Lynne A., Ph.D. (1976)  
*Associate Professor of Psychology*
- Booth, Donald M., M.D. (1982)  
*Clinical Assistant Professor of Orthopaedics and Rehabilitation*
- Boothby, John A., M.D. (1981)  
*Clinical Assistant Professor of Neurology*
- Borman, Linda S., Ph.D. (1982)  
*Research Assistant Professor of Pharmacology*
- Bossange, Janet H., M.S. (1987)  
*Lecturer in Professional Education and Curriculum Development*
- Botler, Joel L., M.D. (1984)  
*Clinical Instructor in Medicine*
- Bouchard, Richard E., M.D. (1955)  
*Professor of Medicine and Family Practice*
- Bousquet, Daniel W., M.B.A. (1975)  
*Extension Associate Professor of Natural Resources*
- Bouton, Edward L., M.S. (1967)  
*Extension Professor of Plant and Soil Science*
- Bouton, Mark E., Ph.D. (1980)  
*Assistant Professor of Psychology*
- Bove, Louis G., M.D. (1981)  
*Clinical Associate Professor of Medicine*
- Bovill, Edwin G., M.D. (1982)  
*Associate Professor of Pathology*
- Bowen, Charles R., D.M.D. (1972)  
*Clinical Assistant Professor of Oral Surgery and Instructor in Dental Hygiene*
- Boyce, Bertie, R., Ph.D. (1958)  
*Professor of Plant and Soil Science*
- Boyce, Charles R., M.D. (1980)  
*Clinical Professor of Obstetrics and Gynecology*
- Boyd, Marjorie A., M.D. (1981)  
*Clinical Associate Professor of Medicine*
- Boyd, Michael L., Ph.D. (1984)  
*Assistant Professor of Economics*
- Boyer, Neil V., M.M. (1973)  
*Lecturer in Music*
- Bradley, Anthony G., Ph.D. (1969)  
*Professor of English*
- Bradley, Deborah A., M.D. (1986)  
*Assistant Professor of Obstetrics and Gynecology*
- Bradley, Patricia H., M.A. (1985)  
*Lecturer in English*
- Bradley, Walter G., D.M. (1982)  
*Professor of Neurology and Pathology*
- Brakeley, Johana K., M.D. (1981)  
*Clinical Instructor in Pediatrics*
- Branda, Richard, M.D. (1983)  
*Professor of Medicine*
- Brandenburg, Richard G., Ph.D. (1987)  
*Professor of Business Administration*
- Braun, Theodore E., Jr., M.D. (1970)  
*Associate Professor of Obstetrics and Gynecology*
- Bray, Emily L., M.D. (1986)  
*Instructor in Family Practice*
- Brayden, Joseph E., Ph.D. (1986)  
*Assistant Professor of Pharmacology*
- Brennan, Brian W., Ph.D. (1987)  
*Adjunct Assistant Professor of Electrical Engineering*
- Brennan, Thomas J., B.S. (1986)  
*Lecturer in Human Development Studies*
- Brenneman, Walter L., Jr., Ph.D. (1969)  
*Associate Professor of Religion*
- Brewster, Thomas G., M.D. (1980)  
*Clinical Assistant Professor of Pediatrics*
- Briggs, Ellen, M.A. (1984)  
*Lecturer in Dental Hygiene*
- Briggs, Russell C., M.D. (1981)  
*Clinical Associate Professor of Radiology*
- Briggs, Winton, M.D. (1981)  
*Clinical Assistant Professor of Medicine*
- Bright, William E., II, Ed.D. (1971)  
*Assistant Professor of Organizational, Counseling, and Foundational Studies*
- Brighton, Deborah, M.S. (1988)  
*Lecturer in Natural Resources*
- Brinkman, Carl A., M.D. (1982)  
*Clinical Assistant Professor of Surgery*
- Brittain, Stephen M., M.D. (1983)  
*Clinical Assistant Professor of Neurology*
- Broadus, Samuel B., M.D. (1985)  
*Clinical Assistant Professor of Urology*
- Broda, Lawrence S., M.D. (1984)  
*Clinical Instructor in Medicine*
- Broer, Stephen M., M.S. (1987)  
*Lecturer in Special Education, Social Work, and Social Services*
- Bronson, David L., M.D. (1977)  
*Associate Professor of Medicine*
- Bronstein, Phyllis, Ph.D. (1981)  
*Associate Professor of Psychology*
- Brook, Judy T., B.S. (1977)  
*Extension Assistant Professor in Extension Service*
- Brook, Munro S., M.A. (1975)  
*Extension Professor in Extension Service*
- Brooks, George W., M.D. (1953)  
*Clinical Professor of Psychiatry*
- Broughton, Laurel G., M.A. (1986)  
*Lecturer in English*
- Broughton, T. Alan, M.A. (1966)  
*Professor of English*
- Brown, Douglas W., M.D. (1982)  
*Clinical Assistant Professor of Orthopaedics and Rehabilitation*
- Brown, Glenn A., M.S. (1987)  
*Extension Instructor in Extension Service*
- Brown, Janet P., Ed.D. (1973)  
*Associate Professor of Professional Nursing*
- Brown, Jerry L., M.S.M.E. (1985)  
*Lecturer in Mechanical Engineering*
- Brown, Joanne C., M.A. (1987)  
*Lecturer in Mathematics*

- Brown, John S., Jr., Ph.D. (1966)  
*Professor of Physics*
- Brown, Kenneth A., M.D. (1984)  
*Assistant Professor of Medicine and Radiology*
- Brown, Patrick, M.Ed. (1979)  
*Lecturer in Organizational, Counseling, and Foundational Studies*
- Brown, Peter M., M.M. (1975)  
*Assistant Professor of Music*
- Brown, Stephen D., M.B.A. (1985)  
*Extension Assistant Professor in Extension Service*
- Browne, Allen F., M.D. (1982)  
*Assistant Professor of Surgery and Pediatrics*
- Brubaker, David, B.S. (1985)  
*Lecturer in Music*
- Bruening, Gary A., M.Ed. (1986)  
*Lecturer in Human Development Studies*
- Brumsted, John R., M.D. (1985)  
*Assistant Professor of Obstetrics and Gynecology*
- Bryan, Frank M., Ph.D. (1976)  
*Associate Professor of Political Science*
- Bryan, George B., Ph.D. (1971)  
*Professor of Theatre*
- Bryan, Phoebe E., M.A. (1984)  
*Lecturer in English*
- Bryant, Daniel C., M.D. (1981)  
*Clinical Instructor in Medicine*
- Bryant, Roger T., M.Ed. (1965)  
*Assistant Professor of Human Development Studies*
- Bucke, David P., Jr., Ph.D. (1969)  
*Associate Professor of Geology*
- Buckley, Lenore M., M.D. (1984)  
*Assistant Professor of Medicine*
- Buechler, John L., M.A.L.S. (1962)  
*Library Professor in Bailey/Howe Library*
- Buhlmann, Marilyn J., B.S. (1988)  
*Extension Instructor in Extension Service*
- Bull, Leonard S., Ph.D. (1981)  
*Professor of Animal Sciences*
- Buonassisi, Vincenzo, M.D. (1986)  
*Adjunct Associate Professor of Zoology*
- Burchard, John D., Ph.D. (1970)  
*Professor of Psychology*
- Burchard, Sara N., Ph.D. (1977)  
*Assistant Professor of Psychology*
- Burczy, Sara A., M.E.Ed. (1977)  
*Extension Assistant Professor in Extension Service*
- Burden, Charles E., M.D. (1980)  
*Clinical Assistant Professor of Pediatrics*
- Burdett, Carol A., M.Ed. (1970)  
*Lecturer in Professional Education and Curriculum Development*
- Burfoot, Michael F., D.A. (1987)  
*Associate Professor of Anesthesiology*
- Burger, Charles S., M.D. (1972)  
*Clinical Assistant Professor of Medicine and Family Practice*
- Burgin, Eileen K., M.A. (1988)  
*Instructor in Political Science*
- Burgmeier, James W., Ph.D. (1969)  
*Associate Professor of Mathematics*
- Burke, John P., Ph.D. (1984)  
*Associate Professor of Political Science*
- Burnett-Kurie, Karen L., M.S.T. (1984)  
*Extension Assistant Professor in Extension Service*
- Burns, Legrand C., M.D. (1968)  
*Clinical Assistant Professor of Medicine*
- Burns, Stanley L., Jr., M.D. (1960)  
*Professor of Medicine*
- Burrell, Leon F., Ph.D. (1971)  
*Associate Professor of Special Education, Social Work, and Social Services*
- Bushweller, C. Hackett, Ph.D. (1978)  
*Professor of Chemistry*
- Bussiere, Elizabeth, M.A. (1987)  
*Visiting Instructor in Political Science*
- Cabot, Myles C., Ph.D. (1986)  
*Adjunct Assistant Professor of Zoology*
- Cain, Robert N., M.D. (1953)  
*Associate Professor of Surgery*
- Calderbank, James B., M.D. (1981)  
*Clinical Assistant Professor of Surgery*
- Caldwell, Edgar J., M.D. (1966)  
*Associate Professor of Medicine*
- Campaigna, Anthony S., Ph.D. (1965)  
*Professor of Economics*
- Campbell, Christine, M.F.A. (1986)  
*Lecturer in Art*
- Campbell, Judy B., M.S. (1977)  
*Extension Assistant Professor in Extension Service*
- Campbell, Linda J., M.S.N. (1985)  
*Clinical Instructor in Obstetrics and Gynecology*
- Cannon, Martin J., M.D. (1953)  
*Clinical Assistant Professor of Obstetrics and Gynecology*
- Capeless, Eleanor L., M.D. (1980)  
*Assistant Professor of Obstetrics and Gynecology*
- Capeless, Mark A., M.D. (1982)  
*Assistant Professor of Medicine*
- Capen, David E., Ph.D. (1976)  
*Associate Professor of Natural Resources*
- Capone, Angela, Ph.D. (1988)  
*Lecturer in Special Education, Social Work, and Social Services*
- Carew, Lyndon B., Jr., Ph.D. (1969)  
*Professor of Animal Sciences*
- Carling, Paul J., Ph.D. (1982)  
*Clinical Assistant Professor of Psychology*
- Carlson, Mary C., B.A. (1968)  
*Extension Assistant Professor in Extension Service*
- Carlson, Robert V., Ed.D. (1971)  
*Professor of Organizational, Counseling, and Foundational Studies*
- Carmichael, Donald L., Ph.D. (1982)  
*Research Associate Professor of Human Development Studies and Special Education, Social Work, and Social Services*
- Carnes, Charlotte C., M.D. (1980)  
*Clinical Instructor in Pediatrics*
- Carnes, Timothy D., M.D. (1981)  
*Clinical Assistant Professor of Medicine*
- Carney, Jan K., M.D. (1984)  
*Clinical Instructor in Medicine*
- Carozza, Jennifer A., M.A. (1987)  
*Library Instructor in Bailey/Howe Library*
- Carrard, Philippe, Ph.D. (1973)  
*Professor of Romance Languages*
- Carroll, Janet E., M.S.N. (1985)  
*Clinical Instructor in Obstetrics and Gynecology*
- Carroll, Ronald J., M.D. (1981)  
*Clinical Associate Professor of Medicine*
- Carter, Jeffrey E., B.S. (1985)  
*Extension Instructor in Extension Service*
- Carter, John H., M.A. (1979)  
*Lecturer in Human Development Studies*
- Carter, William P. Jr., M.D. (1985)  
*Clinical Assistant Professor of Surgery*
- Case, Delvyn C., Jr., M.D. (1981)  
*Clinical Associate Professor of Medicine*
- Casey-Spillane, Jean, M.S. (1983)  
*Adjunct Instructor in Communication Science and Disorders*
- Cassell, Eugene A., Ph.D. (1974)  
*Professor of Natural Resources*
- Caswell, Jerry V., Ph.D. (1986)  
*Library Associate Professor in Bailey/Howe Library*
- Catalano, Patrick M., M.D. (1980)  
*Assistant Professor of Obstetrics and Gynecology*

- Cathcart, Charles J., M.D. (1987)  
*Clinical Instructor in Medicine*
- Cats-Baril, William L., Ph.D. (1982)  
*Associate Professor of Business Administration*
- Causa-Steindler, Mariangela, Ph.D. (1986)  
*Lecturer in Romance Languages*
- Cavin, Thomas J., M.D. (1985)  
*Assistant Professor of Ophthalmology*
- Chabot, Aurore M., M.F.A. (1982)  
*Assistant Professor of Art*
- Chabut-Delavaux, Marie-Helene, Ph.D. (1984)  
*Assistant Professor of Romance Languages*
- Chamberlain, Erling W., Ph.D. (1962)  
*Professor of Mathematics*
- Chamberlain, Valerie M., Ph.D. (1985)  
*Professor of Vocational Education and Technology*
- Chandler, Richard C., M.D. (1985)  
*Clinical Assistant Professor of Surgery*
- Chapados, James T., (1985)  
*Lecturer in Family Practice*
- Chapitis, Jane, Ph.D. (1985)  
*Research Assistant Professor of Obstetrics and Gynecology*
- Chapman, James G., Ph.D. (1968)  
*Professor of Music*
- Charbonneau, Norbert F., M.A. (1960)  
*Lecturer in Computer Science*
- Chase, Christopher R., M.D. (1977)  
*Associate Professor of Anesthesiology*
- Chase, David S., M.D. (1971)  
*Clinical Assistant Professor of Ophthalmology*
- Chase, Marilyn, Ph.D. (1965)  
*Assistant Professor of Human Development Studies*
- Chase, Richard X., Ph.D. (1966)  
*Professor of Economics*
- Chiappinelli, Emanvele Q., M.D. (1981)  
*Clinical Instructor in Pediatrics*
- Chilmoneczyk, Barbara A., M.D. (1984)  
*Clinical Assistant Professor of Pediatrics*
- Chiu, Jen-Fu, Ph.D. (1978)  
*Professor of Biochemistry*
- Christadoss, Premkumar, M.B.B.S. (1985)  
*Assistant Professor of Pathology*
- Christensen, Charles, Jr., M.Ed. (1959)  
*Associate Professor of Human Development Studies*
- Christensen, David P., Ph.D. (1987)  
*Assistant Professor of Philosophy*
- Christiansen, William C., B.S. (1985)  
*Extension Instructor in Extension Service*
- Christie, Lu, M.Ed. (1971)  
*Lecturer in Special Education, Social Work, and Social Services*
- Christie, Walter R., M.D. (1980)  
*Clinical Associate Professor of Psychiatry*
- Christman, John W., M.D. (1983)  
*Assistant Professor of Medicine*
- Christmas, William A., M.D. (1981)  
*Clinical Assistant Professor of Medicine*
- Chun, Sang S., Ph.D. (1987)  
*Visiting Assistant Professor of Obstetrics and Gynecology*
- Chung, Jae K., Ph.D. (1987)  
*Visiting Assistant Professor of Statistics*
- Chupack, Jeanette J., M.F.A. (1983)  
*Lecturer in Merchandising, Consumer Studies, and Design*
- Church, William R., Ph.D. (1986)  
*Research Assistant Professor of Biochemistry*
- Cioffari, Annamarie T., Ph.D. (1982)  
*Clinical Assistant Professor of Psychology*
- Ciongoli, Alfred K., D.O. (1978)  
*Clinical Associate Professor of Neurology*
- Citrin, Murray M., M.A. (1982)  
*Clinical Instructor in Psychiatry*
- Claffey, Thomas F., M.D. (1981)  
*Clinical Assistant Professor of Medicine*
- Clapp, James F., M.D. (1970)  
*Professor of Obstetrics and Gynecology*
- Clark, Anne L., M.Phil. (1988)  
*Instructor in Religion*
- Clark, David E., M.D. (1983)  
*Clinical Assistant Professor of Surgery*
- Clark, James A., M.A.T. (1987)  
*Extension Instructor in Extension Service*
- Clark, Suzanne M., M.A. (1978)  
*Library Assistant Professor in Bailey/Howe Library*
- Clark, Virginia P., Ph.D. (1965)  
*Professor of English*
- Clarke, John H., Ed.D. (1977)  
*Assistant Professor of Professional Education and Curriculum Development*
- Clarke, Lorraine M., Ed.M. (1970)  
*Associate Professor of Technical Nursing*
- Clausen, John C., Ph.D. (1981)  
*Research Assistant Professor of Natural Resources*
- Clements, Dianne B., M.S.C. (1983)  
*Lecturer in Professional Nursing*
- Clements, John P., M.D. (1969)  
*Professor of Radiology and Medicine*
- Clemmons, Jackson J., M.D., Ph.D. (1962)  
*Professor of Pathology*
- Clewley, Elizabeth C., M.D. (1961)  
*Clinical Associate Professor of Pediatrics*
- Clewley, John D., Ph.D. (1985)  
*Research Assistant Professor of Chemistry*
- Cloninger, Chigee J., Ph.D. (1986)  
*Visiting Assistant Professor of Special Education, Social Work, and Social Services*
- Cobb, Richard B., Ph.D. (1985)  
*Visiting Assistant Professor of Special Education, Social Work, and Social Services*
- Cochran, Robert W., Ph.D. (1954)  
*Professor of English*
- Coddaire, David M., M.D. (1979)  
*Clinical Assistant Professor of Family Practice*
- Cody, Elizabeth R., M.Ed. (1985)  
*Lecturer in Special Education, Social Work, and Social Services*
- Coffin, Laurence H., Jr., M.D. (1969)  
*Professor of Thoracic and Cardiac Surgery*
- Coffin, Roberta R., M.D. (1977)  
*Clinical Associate Professor of Pediatrics*
- Cohen, Judith A., M.S. (1981)  
*Assistant Professor of Technical Nursing*
- Cohen, Julius G., M.D. (1950)  
*Professor of Psychiatry*
- Cole, Cynthia H., M.D. (1984)  
*Assistant Professor of Pediatrics*
- Coleman, Philip H., II, B.A. (1987)  
*Lecturer in Chemistry*
- Collen, Desire J., Ph.D. (1985)  
*Professor of Biochemistry and Medicine*
- Colletti, Richard B., M.D. (1974)  
*Assistant Professor of Pediatrics*
- Collier, Theodore A., M.D. (1972)  
*Clinical Assistant Professor of Medicine*
- Committe, Bruce E., Ph.D. (1987)  
*Assistant Professor of Business Administration*
- Compas, Bruce E., Ph.D. (1981)  
*Associate Professor of Psychology*
- Condon, Andrew M., M.S. (1985)  
*Extension Assistant Professor of Agricultural and Resource Economics*
- Condon, Jean A., M.A. (1967)  
*Lecturer in Human Development Studies*
- Connolly, Thomas W., D.M.D. (1979)  
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- Conn-Powers, Michael C., Ph.D. (1985)  
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- Conrad, David R., Ed.D. (1970)  
*Professor of Organizational, Counseling, and Foundational Studies*
- Cook, Francis W., M.D. (1984)  
*Clinical Instructor in Family Practice*
- Cook, George L., M.A.T. (1978)  
*Extension Assistant Professor in Extension Service*
- Cook, Philip W., Ph.D. (1963)  
*Associate Professor of Botany*
- Cooke, Roger L., Ph.D. (1968)  
*Professor of Mathematics*
- Cooper, Sheldon M., M.D. (1982)  
*Professor of Medicine*
- Cope, Timothy T., M.D. (1982)  
*Clinical Assistant Professor in Family Practice*
- Copeland, Lucia G., M.S. (1987)  
*Visiting Assistant Professor of Technical Nursing*
- Copeland, Kenneth C., M.D. (1985)  
*Associate Professor of Pediatrics*
- Copeland, Rodney E., Ph.D. (1980)  
*Adjunct Associate Professor of Psychology*
- Cornbrooks, Carson J., Ph.D. (1982)  
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- Correia, Antonio (1985)  
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- Costante, Joseph F., Ph.D. (1976)  
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- Costanza, Michael C., Ph.D. (1977)  
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- Costello, Paul M., M.D. (1985)  
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- Cote, Lucien M., B.S. (1969)  
*Clinical Instructor in Medical Technology*
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- Coward, Raymond T., Ph.D. (1979)  
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- Craighead, John E., M.D. (1968)  
*Professor of Pathology*
- Crane, Nancy B., M.S. (1969)  
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- Creekmore, Harry S., M.D. (1987)  
*Clinical Assistant Professor of Plastic Surgery*
- Creelman, Wayne L., M.D. (1986)  
*Clinical Assistant Professor of Psychiatry*
- Crichfield, Grant, Ph.D. (1968)  
*Associate Professor of Romance Languages*
- Croze, Ruth A., M.D. (1982)  
*Clinical Instructor in Family Practice*
- Cross, James M., B.S. (1964)  
*Instructor in Human Development Studies*
- Cross, Robert M., M.D. (1972)  
*Clinical Instructor in Medicine*
- Crouch, Edward P., III, M.D. (1984)  
*Clinical Instructor in Medicine*
- Crouch, Milton H., M.S. (1969)  
*Library Professor in Bailey/Howe Library*
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*Clinical Instructor in Surgery*
- Curci, Michael R., M.D. (1982)  
*Clinical Assistant Professor of Surgery*
- Currier, Willard F., M.S. (1987)  
*Lecturer in Human Development Studies*
- Currier, William W., Ph.D. (1977)  
*Associate Professor of Agricultural Biochemistry*
- Cutler, D. Joshua, M.D. (1986)  
*Clinical Instructor in Medicine*
- Cutler, Stephen J., Ph.D. (1984)  
*Bishop Robert F. Joyce Distinguished University Professor of Gerontology*
- Cutroneo, Kenneth R., Ph.D. (1976)  
*Professor of Biochemistry*
- Czerniawski, Florence, B.A. (1967)  
*Instructor in Medical Technology*
- Dale, Rosemary L., Ed.D. (1976)  
*Associate Professor of Professional and Technical Nursing*
- Danforth, Elliott, Jr., M.D. (1970)  
*Professor of Medicine*
- Danielson, Paul A., D.M.D. (1978)  
*Clinical Associate Professor of Oral Surgery*
- Danielson, Ursel, M.D. (1972)  
*Clinical Associate Professor of Psychiatry*
- Danigelis, Nicholas L., Ph.D. (1975)  
*Associate Professor of Sociology*
- Dargan, Peggy A., M.Ed. (1987)  
*Lecturer in Professional Education and Curriculum Development*
- Davis, George B., M.D.C.M. (1972)  
*Clinical Instructor in Medicine*
- Davis, Gerald S., M.D. (1971)  
*Professor of Medicine*
- Davis, Hamilton E., B.S. (1983)  
*Lecturer in Botany*
- Davis, John H., M.D. (1968)  
*Professor of Surgery*
- Davis, Philip H., M.D. (1958)  
*Clinical Professor of Orthopaedics and Rehabilitation*
- Davis, Robert E., M.D. (1968)  
*Clinical Associate Professor of Obstetrics and Gynecology*
- Davis, Wendy S., M.D. (1987)  
*Assistant Professor of Pediatrics*
- Davison, Jean M., Ph.D. (1955)  
*Lyman-Roberts Professor of Classical Languages and Literature and Professor of History*
- Davison, John A., Ph.D. (1967)  
*Associate Professor of Zoology*
- Davison, William E., M.F.A. (1967)  
*Associate Professor of Art*
- Dawson, Robert F., Ph.D. (1969)  
*Professor of Civil Engineering and Computer Science*
- Dean, Howard B., M.D. (1987)  
*Clinical Assistant Professor of Medicine*
- Deane, Robert S., M.B., B.Ch. (1967)  
*Associate Professor of Anesthesiology*
- Deaton, Jeffrey L., M.D. (1987)  
*Instructor in Obstetrics and Gynecology*
- Deck, Edith F., M.S. (1969)  
*Associate Professor of Professional Nursing*
- DeCola, Felix L., Ph.D. (1986)  
*Assistant Professor of Geography*
- DeGrove, Kimberly A., B.S. (1987)  
*Clinical Instructor in Medical Technology*
- DeHayes, Donald H., Ph.D. (1977)  
*Associate Professor of Natural Resources*
- Deininger, Raymond J., A.S. (1987)  
*Instructor in Radiologic Technology*
- Delozier, Howard L., M.D. (1978)  
*Assistant Professor of Otolaryngology*
- Demeules, James E., M.D. (1972)  
*Associate Professor of Surgery*
- Deming, Howard R., M.D. (1981)  
*Clinical Associate Professor of Radiology*
- Dempsey, Stephen J., Ph.D. (1987)  
*Assistant Professor of Business Administration*



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*Lecturer in Natural Resources*
- Dennison, W. Landon, Jr., M.D. (1970)  
*Clinical Associate Professor of Medicine*
- Desieyes, Charles J., M.D. (1981)  
*Clinical Instructor in Family Practice*
- Desilvey, Dennis L., M.D. (1984)  
*Clinical Assistant Professor of Medicine*
- Detenbeck, Robert W., Ph.D. (1967)  
*Professor of Physics*
- Dever, Maureen, Ph.D. (1987)  
*Assistant Professor in Merchandising, Consumer Studies, and Design*
- Devlin, John T., M.D. (1983)  
*Assistant Professor of Medicine*
- Deziel, Gary R., M.S. (1984)  
*Extension Assistant Professor in Extension Service*
- Dickerman, Joseph D., M.D. (1972)  
*Professor of Pediatrics*
- Dickerson, Albert I., Jr., Ph.D. (1966)  
*Associate Professor of English*
- Dickerson, Mary J., M.A. (1973)  
*Lecturer in English*
- Dietrich, Peter A., M.D. (1971)  
*Professor of Radiology*
- Dietzel, Cleason S., Ph.D. (1971)  
*Clinical Associate Professor of Psychology*
- Dillon, Richard T., M.Ed. (1987)  
*Lecturer in Professional Education and Curriculum Development*
- Dinitz, Jeffrey H., Ph.D. (1980)  
*Associate Professor of Mathematics*
- Ditchey, Roy V., M.D. (1985)  
*Associate Professor of Medicine*
- Dodge, Carroll W., Ph.D. (1970)  
*Visiting Professor of Botany*
- Does, Richard B., Ph.D. (1969)  
*Clinical Assistant Professor of Psychology*
- Doil, Kenneth L., M.D. (1980)  
*Clinical Assistant Professor of Obstetrics and Gynecology*
- Doiron, Richard G., Ph.D. (1987)  
*Clinical Associate Professor of Psychiatry*
- Donegan, Desmond J., M.B., B.Ch. (1983)  
*Clinical Assistant Professor of Cardiology*
- Donnellan, La Rae M., M.A. (1975)  
*Extension Associate Professor of Vocational Education and Technology*
- Donnelly, Catherine W., Ph.D. (1983)  
*Assistant Professor of Animal Sciences*
- Donnelly, John R., Ph.D. (1969)  
*Associate Professor of Natural Resources*
- Donnelly, L. Scott, Ph.D. (1983)  
*Adjunct Assistant Professor of Animal Sciences*
- Doolan, Barry L., Ph.D. (1970)  
*Associate Professor of Geology*
- Dopp, Sarah L., M.A. (1977)  
*Clinical Instructor in Medical Technology*
- Dorsk, Brian M., M.D. (1981)  
*Clinical Assistant Professor of Medicine*
- Dorwart, Robert H., M.D. (1986)  
*Associate Professor of Radiology*
- Douglas, Jeanne M., M.S. (1985)  
*Lecturer in Computer Science*
- Dowling, Patrick A., M.D. (1982)  
*Clinical Assistant Professor of Orthopaedics and Rehabilitation*
- Downer, Richard N., Ph.D. (1967)  
*Associate Professor of Civil Engineering*
- Drake, Emerson H., M.D. (1982)  
*Clinical Professor of Surgery*
- Drake, John C., Ph.D. (1970)  
*Associate Professor of Geology*
- Dransfield, Douglas A., M.D. (1980)  
*Clinical Assistant Professor of Pediatrics*
- Driscoll, John P., M.D. (1984)  
*Clinical Instructor in Medicine*
- Ducharme, Edward R., Ed.D. (1973)  
*Professor of Organizational, Counseling, and Foundational Studies*
- Dummit, David S., Ph.D. (1984)  
*Assistant Professor of Mathematics*
- Duncan, Paula M., M.D. (1984)  
*Clinical Assistant Professor of Pediatrics*
- Dunlop, William L., M.L. (1968)  
*Library Assistant Professor in Bailey/Howe Library*
- Durett, Carol L., B.S. (1981)  
*Clinical Instructor in Medical Technology*
- Durfee, Herbert A., Jr., M.D. (1957)  
*Professor of Obstetrics and Gynecology*
- Durfee, Tamara, M.S. (1985)  
*Library Assistant Professor in Dana Medical Library*
- Durso, Nicholas A., Ph.D. (1984)  
*Lecturer in English*
- Duthie, Alexander H., Ph.D. (1964)  
*Professor of Animal Sciences*
- Dyhrberg, John S., M.D. (1984)  
*Clinical Assistant Professor of Urology*
- Dyment, Paul G., M.D. (1986)  
*Professor of Pediatrics*
- Dzewaltowski, Julie A., M.S. (1986)  
*Adjunct Instructor in Communication Science and Disorders*
- Eaton, Nancy L., M.L.S. (1982)  
*Library Professor in Bailey/Howe Library*
- Echelberger, Herbert E., Ph.D. (1985)  
*Adjunct Associate Professor of Natural Resources*
- Eckhardt, Shohreh, B.A. (1986)  
*Research Associate in Pharmacology*
- Eddy, William H., Jr., B.A. (1980)  
*Adjunct Assistant Professor of Natural Resources and Environmental Studies*
- Edelman, Susan W., M.Ed. (1977)  
*Lecturer in Special Education, Social Work, and Social Services and Physical Therapy*
- Edwards, Keith R., M.D. (1987)  
*Clinical Assistant Professor of Neurology*
- Edwards, Margaret F., Ph.D. (1971)  
*Associate Professor of English*
- Elkins, Alan M., M.D. (1980)  
*Professor of Psychiatry*
- Ellerson, R. David, M.D. (1970)  
*Clinical Instructor in Pediatrics*
- Elliott, Carolyn M., Ph.D. (1987)  
*Professor of Political Science*
- Elliott, Norris A., M.E.Ed. (1967)  
*Extension Associate Professor in Extension Service*
- Elliott, Riley A., D.D.S. (1983)  
*Assistant Professor of Anesthesiology*
- Ellis, John, Ph.D. (1980)  
*Research Associate Professor of Psychiatry*
- Ellis-Monaghan, Joanna A., M.S. (1986)  
*Lecturer in Mathematics*
- Elstner, Christopher L., M.D. (1985)  
*Clinical Instructor in Pediatrics*
- Emanuelson, Jane F., A.S. (1987)  
*Clinical Instructor in Dental Hygiene*
- Emerson, Faith G., M.A. (1959)  
*Associate Professor of Professional Nursing*
- Emery, Carol, M.A. (1987)  
*Adjunct Instructor in Communication Science and Disorders*
- Emery, E. Stanley, III, M.D. (1970)  
*Associate Professor of Neurology and Pediatrics*
- Emery, Michael J., M.Ed. (1984)  
*Assistant Professor of Physical Therapy*

- Emmanuel, Narbeth R., Ph.D. (1981)  
*Assistant Professor of Organizational, Counseling, and Foundational Studies*
- English, Wesley J., M.D. (1982)  
*Clinical Associate Professor of Surgery*
- Eppstein, Margaret J., M.S. (1983)  
*Lecturer in Computer Science*
- Erb, Clinton A., Ph.D. (1971)  
*Associate Professor of Professional Education and Curriculum Development*
- Ernst, David C., M.D. (1980)  
*Clinical Assistant Professor of Obstetrics and Gynecology*
- Ervin, Thomas J., M.D. (1985)  
*Lecturer in Medicine*
- Ervin, William C., M.D. (1981)  
*Clinical Assistant Professor of Medicine*
- Eschholz, Paul A., Ph.D. (1969)  
*Professor of English*
- Etherton, Bud, Ph.D. (1968)  
*Professor of Botany*
- Evans, John N., Ph.D. (1976)  
*Associate Professor of Physiology and Biophysics*
- Evans, Stanley J., M.D. (1985)  
*Clinical Assistant Professor of Psychiatry*
- Evering, Frederick, Jr., Ph.D. (1965)  
*Professor of Electrical Engineering*
- Ezekiel, Patricia A., M.S. (1981)  
*Associate Professor of Medical Technology*
- Fairbank, Jonathan T., M.D. (1976)  
*Associate Professor of Radiology*
- Fanning, Constance M., L.R.C.P. (1980)  
*Clinical Assistant Professor of Psychiatry*
- Fanning, Joseph P., M.B., B.Ch. (1981)  
*Clinical Associate Professor of Pathology*
- Farnham, John E., D.M.D. (1963)  
*Clinical Professor of Oral Surgery and Associate Professor of Dental Hygiene*
- Farnham, Richard A., M.Ed. (1974)  
*Lecturer in Human Development Studies*
- Farrell, Nicholas P., Ph.D. (1984)  
*Research Associate Professor of Chemistry*
- Farrell, Sandra M., M.S. (1968)  
*Lecturer in Human Development Studies*
- Fassler, David, M.D. (1987)  
*Clinical Assistant Professor of Psychiatry*
- Faucette, Robert A., M.D. (1982)  
*Clinical Assistant Professor of Pediatrics*
- Feidner, Edward J., M.F.A. (1958)  
*Professor of Theatre*
- Feitelberg, Samuel B., M.A. (1971)  
*Professor of Physical Therapy*
- Feldman, Jan, Ph.D. (1982)  
*Assistant Professor of Political Science*
- Felt, Jeremy P., Ph.D. (1957)  
*Professor of History*
- Fengler, Alfred P., Ph.D. (1976)  
*Associate Professor of Sociology*
- Fengler-Stephany, Christie K., Ph.D. (1970)  
*Associate Professor of Art*
- Fenn, Mary Ellen, M.D. (1980)  
*Clinical Instructor in Obstetrics and Gynecology*
- Fenton, Ardith M., B.S. (1987)  
*Extension Instructor in Extension Service*
- Fenwick, James W., Ph.D. (1986)  
*Research Assistant Professor of Statistics*
- Ferguson, John C., M.D. (1982)  
*Clinical Assistant Professor of Family Practice*
- Fernandez, Lisa M., M.Ed. (1981)  
*Lecturer in Human Development Studies*
- Ferreira, Charles W., Ph.D. (1975)  
*Associate Professor of Vocational Education and Technology*
- Fiekers, Jerome F., Ph.D. (1978)  
*Associate Professor of Anatomy and Neurobiology*
- Fife, C. Lynn, Ph.D. (1966)  
*Associate Professor of Agricultural and Resource Economics*
- Fifield, William K., M.D. (1982)  
*Clinical Assistant Professor of Family Practice*
- Fillyaw, Michael J., M.S. (1983)  
*Clinical Instructor in Neurology*
- Fink, Theodore J., M.D. (1977)  
*Clinical Instructor in Medicine*
- Finney, Henry C., Ph.D. (1973)  
*Associate Professor of Sociology*
- Fiore, Joellen B., B.S. (1986)  
*Clinical Instructor in Medical Technology*
- Fischer, Joseph C., M.A. (1980)  
*Lecturer in Human Development Studies*
- Fischer, Steven R., D.D.S. (1987)  
*Lecturer in Dental Hygiene*
- Fishell, Kenneth N., Ed.D. (1971)  
*Professor of Professional Education and Curriculum Development*
- Fishman, Laura T., Ph.D. (1976)  
*Associate Professor of Sociology*
- Fitzgerald, Carol R., M.A.T. (1977)  
*Extension Associate Professor in Extension Service*
- Fitzgerald, John R., M.D. (1961)  
*Clinical Assistant Professor of Medicine*
- Fitzgerald, Martha D., Ed.D. (1970)  
*Associate Professor of Special Education, Social Work, and Social Services*
- Fitzhenry-Coor, Ina, Ph.D. (1976)  
*Assistant Professor of Psychiatry*
- Fitzmorris, Daniel J., M.S. (1987)  
*Lecturer in Mechanical Engineering*
- Fives-Taylor, Paula M., Ph.D. (1976)  
*Professor of Microbiology*
- Flack, Jean R., Ph.D. (1978)  
*Associate Professor of Natural Resources and Environmental Studies*
- Flaherty, Diane P., Ph.D. (1987)  
*Visiting Associate Professor of Economics*
- Flanagan, Martin E., M.D. (1962)  
*Associate Professor of Neurosurgery*
- Flanagan, Ted B., Ph.D. (1961)  
*Professor of Chemistry and Mechanical Engineering*
- Fleming, Shari B., M.M. (1970)  
*Lecturer in Music*
- Flinn, Paul L., B.S. (1986)  
*Lecturer in Natural Resources*
- Flynn, Brian S., Sc.D. (1980)  
*Research Assistant Professor of Family Practice*
- Fobbs, Joan M., M.S. (1985)  
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- Foley, Marion R., B.S. (1980)  
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- Folta, Jeannette R., Ph.D. (1969)  
*Professor of Sociology*
- Fonda, Bruce J., M.S. (1980)  
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- Foote, Richard, Ph.D. (1981)  
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- Forcier, Lawrence K., Ph.D. (1977)  
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- Ford, Dorothy E., M.D. (1968)  
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- Ford, John R., Ph.D. (1987)  
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- Ford, Sandra D., M.A. (1987)  
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- Forgays, Donald G., Ph.D. (1964)  
*Professor of Psychology*
- Forgione, Rose J., M.A. (1964)  
*Associate Professor of Professional Nursing*
- Forman, Michele V., M.Ed. (1987)  
*Lecturer in Human Development Studies*
- Forsyth, Ben R., M.D. (1966)  
*Professor of Medicine and Associate Professor of Microbiology*
- Foss, Donald C., Ph.D. (1966)  
*Professor of Animal Sciences*
- Foster, James C., M.D. (1987)  
*Clinical Instructor in Pediatrics*
- Foster, Roger S., Jr., M.D. (1970)  
*Professor of Surgery*
- Fowler, Nicholas K., M.D. (1982)  
*Clinical Assistant Professor of Pediatrics*
- Fox, Carolyn W., M.L.I.S. (1981)  
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- Fox, Timothy J., M.Ed. (1985)  
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- Fox, Wayne L., Ph.D. (1969)  
*Professor of Special Education, Social Work, and Social Services*
- Francis, Gerald P., Ph.D. (1980)  
*Professor of Mechanical Engineering*
- Frankowski, Barbara L., M.D. (1985)  
*Assistant Professor of Pediatrics*
- Frederick, Philip P., M.D. (1987)  
*Clinical Instructor in Medicine*
- Freedman, Steven L., Ph.D. (1964)  
*Associate Professor of Anatomy and Neurobiology*
- Frey, Lois M., B.S. (1977)  
*Extension Instructor in Extension Service*
- Fries, Timothy J., M.D. (1986)  
*Assistant Professor of Neurology*
- Fritz, Ronald E., M.D. (1983)  
*Clinical Associate Professor of Anesthesiology*
- Frost, Richard B., M.D. (1985)  
*Clinical Instructor in Medicine*
- Frymoyer, John W., M.D. (1969)  
*Professor of Orthopaedics and Rehabilitation*
- Fuhr, Peter L., Ph.D. (1985)  
*Assistant Professor of Electrical Engineering*
- Fuhrman, Karl, D., (1987)  
*Instructor in Military Studies*
- Fuller, Gerald R., Ed.D. (1968)  
*Professor of Vocational Education and Technology and Professional Education and Curriculum Development*
- Fuller, Robert W., M.S. (1966)  
*Assistant Professor of Natural Resources*
- Fulwiler, Toby E., Ph.D. (1983)  
*Professor of English*
- Gade, Daniel W., Ph.D. (1966)  
*Professor of Geography*
- Gaenslen, Fritz R., Ph.D. (1984)  
*Assistant Professor of Political Science*
- Gallagher, Connell B., M.S. (1970)  
*Library Professor in Bailey/Howe Library*
- Gallagher, John J., M.D. (1987)  
*Clinical Instructor in Obstetrics and Gynecology*
- Gallagher, Rollin M., M.D. (1976)  
*Associate Professor of Psychiatry and Family Practice*
- Gambi Fernandez, Jose M., Ph.D. (1986)  
*Visiting Professor of Mechanical Engineering*
- Gamelli, Richard L., M.D. (1979)  
*Associate Professor of Surgery*
- Gannon, Jane M., M.S.N. (1987)  
*Clinical Instructor in Obstetrics and Gynecology*
- Gatti, James F., Ph.D. (1972)  
*Associate Professor of Business Administration*
- Gay, Barbara T., M.L.S. (1962)  
*Library Associate Professor in Bailey/Howe Library*
- Gazda, Thomas D., M.D. (1985)  
*Clinical Assistant Professor of Psychiatry*
- Gedeon, Shirley J., Ph.D. (1981)  
*Associate Professor of Economics*
- Geiger, William E., Jr., Ph.D. (1974)  
*Professor of Chemistry*
- Geller, Berta M., M.Ed. (1981)  
*Lecturer in Human Development Studies*
- Gennari, F. John, M.D. (1979)  
*Professor of Medicine*
- Geno, Marie J., M.A. (1972)  
*Lecturer in Romance Languages*
- Geno, Thomas H., Ph.D. (1965)  
*Associate Professor of Romance Languages*
- Gentry, Stokes, M.D. (1962)  
*Clinical Professor of Pediatrics*
- Geoghegan, Thomas, (1983)  
*Lecturer in Music*
- Geraghty, Sheila, M.S. (1987)  
*Adjunct Instructor in Communication Science and Disorders*
- Gerber, Judith R., M.F.A. (1986)  
*Lecturer in Art*
- Gertlach, Jay C., M.S. (1985)  
*Assistant Professor of Military Studies*
- Gerlach, Robert W., M.P.H., (1987)  
*Assistant Professor of Dental Hygiene*
- Giasson, Susan, B.S. (1985)  
*Instructor in Radiologic Technology*
- Gibbard, Bruce A., M.D. (1981)  
*Clinical Associate Professor of Psychiatry*
- Gibbons, Walter R., Ph.D. (1971)  
*Professor of Physiology and Biophysics*
- Gibson, Kenneth S., M.S. (1964)  
*Extension Professor of Animal Sciences*
- Gibson, Mark, M.D. (1978)  
*Associate Professor of Obstetrics and Gynecology*
- Gibson, Mary H., M.S.N. (1979)  
*Clinical Instructor in Obstetrics and Gynecology*
- Gibson, William A., Ph.D. (1986)  
*Associate Professor of Economics*
- Gil, Janusz A., (1988)  
*Research Assistant Professor of Physics*
- Gilbert, Alphonse H., Ph.D. (1969)  
*Associate Professor of Agricultural and Resource Economics*
- Gilbert, Stuart, G., M.D. (1981)  
*Clinical Associate Professor of Radiology*
- Gilleland, Brady B., Ph.D. (1957)  
*Professor of Classics*
- Gilligan, Michael W., B.S. (1984)  
*Lecturer in Human Development Studies*
- Gillis, Marilyn B., M.Ed. (1987)  
*Lecturer in Human Development Studies*
- Gilmore, James A., Ph.D. (1975)  
*Assistant Professor of Animal Sciences*
- Giroux, Sandra N., B.S. (1985)  
*Clinical Instructor in Medical Technology*
- Givertz, Bernard, M.D. (1981)  
*Clinical Assistant Professor of Medicine*
- Glantz, Stanton A., Ph.D. (1988)  
*Visiting Professor of Medicine*
- Glesne, Corrine E., Ph.D. (1986)  
*Assistant Professor of Organizational, Counseling, and Foundational Studies*
- Gobin, Robert J., Ph.D. (1965)  
*Professor of Human Development Studies*
- Goldberg, Joel M., Ph.D. (1982)  
*Associate Professor of Chemistry*

- Golden, Gale H., M.S.W. (1982)  
*Clinical Assistant Professor of Psychiatry*
- Golden, Kenneth I., Ph.D. (1986)  
*Professor of Electrical Engineering*
- Goldfarb, Walter B., M.D. (1982)  
*Clinical Assistant Professor of Surgery*
- Goldfine, Peter E., M.D. (1980)  
*Clinical Associate Professor of Psychiatry*
- Goldhaber, Dale E., Ph.D. (1973)  
*Associate Professor of Human Development Studies*
- Goldhaber, Jeanne D., M.Ed. (1984)  
*Lecturer in Human Development Studies*
- Golodetz, Arnold, M.D. (1985)  
*Clinical Associate Professor of Medicine*
- Gomez, Antonio J., M.D. (1970)  
*Associate Professor of Neurology*
- Goodrich, John F., M.D. (1982)  
*Clinical Assistant Professor of Pediatrics*
- Goodson, Hesterly B., B.A. (1986)  
*Lecturer in English*
- Goodwin, James H., M.S. (1988)  
*Assistant Professor of Radiology*
- Gordon, Lawrence R., Ph.D. (1970)  
*Associate Professor of Psychology*
- Gordon, Mark A., M.F.A. (1986)  
*Visiting Assistant Professor of Theatre*
- Gordon, Robert J., Ph.D. (1979)  
*Associate Professor of Anthropology*
- Gotlieb, Alan R., Ph.D. (1974)  
*Extension Associate Professor of Plant and Soil Science*
- Gottlieb, Charles D., M.S. (1980)  
*Lecturer in Organizational, Counseling, and Foundational Studies*
- Gottlieb, Diane T., M.S.W. (1983)  
*Lecturer in Organizational, Counseling, and Foundational Studies*
- Grace, Christopher J., M.D. (1987)  
*Assistant Professor of Medicine*
- Graffagnino, J. Kevin, M.A. (1977)  
*Library Associate Professor in Bailey/Howe Library*
- Graham, William G., M.D. (1971)  
*Professor of Medicine*
- Graman, Howard, B., M.D. (1978)  
*Associate Professor of Medicine*
- Grams, Armin E., Ph.D. (1971)  
*Professor of Human Development Studies*
- Granai, Cornelius O., Jr., M.D. (1967)  
*Clinical Assistant Professor of Obstetrics and Gynecology*
- Grant, Barbara W., M.D. (1984)  
*Assistant Professor of Medicine*
- Grayson, Jane, Ph.D. (1979)  
*Clinical Assistant Professor of Psychiatry*
- Green, Janet E., Ph.D. (1987)  
*Lecturer in Romance Languages*
- Gregory, Robert A., Ph.D. (1983)  
*Adjunct Associate Professor of Natural Resources*
- Greig, Harold A., M.P.E. (1962)  
*Assistant Professor of Human Development Studies*
- Gribbons, Jackie M., M.A. (1966)  
*Assistant Professor of Organizational, Counseling, and Foundational Studies*
- Griffin, John P., M.D. (1978)  
*Clinical Assistant Professor of Medicine*
- Griffin, Robert S., Ph.D. (1974)  
*Associate Professor of Professional Education and Curriculum Development*
- Grimes, Charles K., M.D. (1984)  
*Clinical Assistant Professor of Radiology*
- Grinnell, D. Jacque, D.B.A. (1978)  
*Professor of Business Administration*
- Grobler, Leon J., M.Med. (1987)  
*Assistant Professor of Orthopaedics and Rehabilitation*
- Gross, Cordell E., M.D. (1987)  
*Professor of Neurology*
- Gross, Kenneth I., Ph.D. (1987)  
*Visiting Professor of Mathematics*
- Guerette, Sally C., M.S. (1969)  
*Lecturer in Human Development Studies*
- Guiduli, Robert C., M.D. (1966)  
*Clinical Associate Professor of Ophthalmology*
- Guignon, Charles B., Ph.D. (1985)  
*Associate Professor of Philosophy*
- Guillot, Ann P., M.D. (1979)  
*Associate Professor of Pediatrics*
- Guitar, Barry E., Ph.D. (1976)  
*Professor of Communication Science and Disorders and Psychology*
- Gump, Dieter W., M.D. (1966)  
*Professor of Medicine and Microbiology*
- Gundel, Walter D., M.D.C.M. (1987)  
*Associate Professor of Medicine*
- Gunther, Peter G., M.D. (1985)  
*Assistant Professor of Medicine*
- Gurdon, Michael A., Ph.D. (1980)  
*Associate Professor of Business Administration*
- Gussner, Robert E., Ph.D. (1969)  
*Assistant Professor of Religion*
- Gustafson, Thomas J., M.A. (1978)  
*Lecturer in Organizational, Counseling, and Foundational Studies*
- Gutman, Stanley T., Ph.D. (1971)  
*Associate Professor of English*
- Guttmacher, Alan E., M.D. (1987)  
*Assistant Professor of Pediatrics*
- Hacker, Miles P., Ph.D. (1979)  
*Associate Professor of Pharmacology*
- Hackford, Robert R., Jr., M.D. (1980)  
*Clinical Instructor in Pediatrics*
- Haddock, Joseph H., M.D. (1981)  
*Clinical Assistant Professor of Medicine*
- Haddow, James E., M.D. (1980)  
*Clinical Associate Professor of Pediatrics*
- Hadeka, Michele A., M.S. (1979)  
*Associate Professor of Professional Nursing*
- Hagan, Joseph F., Jr., M.D. (1979)  
*Clinical Assistant Professor of Pediatrics*
- Haig, Andrew J., M.D. (1986)  
*Assistant Professor of Orthopaedics and Rehabilitation*
- Haines, Carleton R., M.D. (1950)  
*Associate Professor of Surgery*
- Haisch, Carl E., M.D. (1984)  
*Assistant Professor of Surgery*
- Hall, Mary S., Ph.D. (1968)  
*Associate Professor in English*
- Hall, Robert W., Ph.D. (1957)  
*James Marsh Professor of Intellectual and Moral Philosophy*
- Hall, William J., III, M.D. (1981)  
*Clinical Associate Professor of Medicine*
- Hallee, Theodore J., M.D. (1984)  
*Clinical Assistant Professor of Medicine*
- Haller, Daniel J., M.D. (1987)  
*Assistant Professor of Family Practice*
- Hallett, George W., M.D. (1980)  
*Clinical Professor of Pediatrics*
- Halpern, William, Ph.D. (1969)  
*Associate Professor of Physiology and Biophysics*
- Halvorsen, Lisa, M.A. (1984)  
*Extension Assistant Professor in Extension Service*
- Hamdy, Hosny I., Ph.D. (1985)  
*Assistant Professor of Statistics*
- Hamel, Herbert E., Jr., M.D. (1983)  
*Clinical Instructor in Anesthesiology*
- Hamel-Bissell, Brenda P., Ed.D. (1981)  
*Associate Professor of Professional Nursing*

- Hamilton, Ruth I., Ph.D. (1987)  
*Visiting Assistant Professor of Special Education, Social Work, and Social Services*
- Hammond, Paulette B., B.S. (1984)  
*Clinical Instructor in Medical Technology*
- Hamrell, Burt B., M.D., Ph.D. (1968)  
*Associate Professor of Physiology and Biophysics and Medicine*
- Hamrell, Recille C., M.S. (1987)  
*Adjunct Instructor in Communication Science and Disorders*
- Hand, Samuel B., Ph.D. (1961)  
*Professor of History*
- Hanley, Edward M., Ph.D. (1969)  
*Professor of Professional Education and Curriculum Development*
- Hannah, Judith L., Ph.D. (1982)  
*Associate Professor of Geology*
- Hannah, Peter R., Ph.D. (1967)  
*Professor of Natural Resources*
- Hannemann, Joseph H., M.D. (1981)  
*Clinical Associate Professor of Radiology*
- Hansen, Chad D., Ph.D. (1978)  
*Professor of Philosophy*
- Happ, George M., Ph.D. (1978)  
*Professor of Zoology*
- Hardesty, Vaughn A., Ph.D. (1980)  
*Clinical Assistant Professor of Psychiatry*
- Hardin, Nicholas J., M.D. (1977)  
*Associate Professor of Pathology*
- Hardy, Edmund W., M.D. (1981)  
*Clinical Assistant Professor of Medicine*
- Harper, James A., M.D. (1986)  
*Instructor in Family Practice*
- Harris, Douglas E., Ph.D. (1984)  
*Adjunct Professor of Organizational, Counseling, and Foundational Studies*
- Harris, Everett W., Ed.D. (1978)  
*Extension Associate Professor of Vocational Education and Technology*
- Harris, Mark W., B.S. (1985)  
*Clinical Instructor in Radiologic Technology*
- Harris, Stephen E., Ph.D. (1985)  
*Adjunct Associate Professor of Biochemistry*
- Hart, Beth A., Ph.D. (1970)  
*Associate Professor of Biochemistry*
- Hartenstein, Robert W., M.S. (1982)  
*Adjunct Instructor in Communication Science and Disorders*
- Hartley, Stephen J., Ph.D. (1983)  
*Assistant Professor of Computer Science*
- Hasazi, Joseph E., Ph.D. (1970)  
*Associate Professor of Psychology*
- Hasazi, Susan E., Ed.D. (1976)  
*Associate Professor of Special Education, Social Work, and Social Services and Assistant Professor of Vocational Education and Technology*
- Haskell, David W., M.D. (1981)  
*Clinical Associate Professor of Family Practice*
- Hassler, Carol R., M.D. (1986)  
*Clinical Assistant Professor of Pediatrics*
- Hatch, Norman L., Jr., Ph.D. (1978)  
*Adjunct Professor of Geology*
- Haugh, Larry D., Ph.D. (1975)  
*Professor of Statistics*
- Haviland, William A., Ph.D. (1965)  
*Professor of Anthropology*
- Hayashi, Jun, Ph.D. (1986)  
*Adjunct Assistant Professor of Zoology*
- Hayden, Jay G., M.D. (1983)  
*Clinical Assistant Professor of Anesthesiology*
- Hayden, Jonathan B., M.D. (1987)  
*Clinical Assistant Professor of Medicine*
- Hayes, Daniel M., M.D. (1985)  
*Clinical Instructor in Medicine*
- Hayes, Margaret E., M.S. (1966)  
*Lecturer in Human Development Studies*
- Hayward, Robert G., M.D. (1987)  
*Clinical Assistant Professor of Obstetrics and Gynecology*
- Hazard, Rowland G., M.D. (1981)  
*Assistant Professor of Medicine and Orthopaedics and Rehabilitation*
- Heaps, Richard W., M.S. (1980)  
*Lecturer in Economics*
- Heath, Barry W., M.D. (1981)  
*Clinical Assistant Professor of Pediatrics*
- Heath, Gordon A., M.D. (1980)  
*Clinical Associate Professor of Psychiatry*
- Hebert, James C., M.D. (1982)  
*Associate Professor of Surgery*
- Hedberg, Robert R., B.S. (1984)  
*Extension Instructor in Extension Service*
- Hegner, Stephen J., Ph.D. (1982)  
*Associate Professor of Electrical Engineering*
- Heilman, Richard S., M.D. (1968)  
*Professor of Radiology*
- Heinrich, Bernd, Ph.D. (1980)  
*Professor of Zoology*
- Heintz, Judith F., M.S. (1985)  
*Adjunct Assistant Professor of Animal Sciences*
- Heintz, Nicholas H., Ph.D. (1983)  
*Assistant Professor of Pathology and Biochemistry*
- Heitzman, Mark R., M.D. (1985)  
*Clinical Instructor in Medicine*
- Held, Jean M., Ed.D. (1981)  
*Associate Professor of Physical Therapy*
- Hemenway, David R., Ph.D. (1974)  
*Professor of Civil Engineering*
- Hemley, Marcia W., Ph.D. (1986)  
*Adjunct Assistant Professor of Psychology*
- Hendley, Edith D., Ph.D. (1973)  
*Professor of Physiology and Biophysics and Psychiatry*
- Hennessy, Cathleen A., A.A.S. (1986)  
*Clinical Instructor in Radiologic Technology*
- Henriksen, Ruth A., Ph.D. (1987)  
*Visiting Assistant Professor of Biochemistry*
- Henson, E. Bennette, Ph.D. (1965)  
*Professor of Zoology*
- Herbers, Joan M., Ph.D. (1980)  
*Associate Professor of Zoology*
- Hernance, Clarke E., Ph.D. (1982)  
*Professor of Mechanical Engineering*
- Herreid, Todd, Ph.D. (1988)  
*Assistant Professor of Economics*
- Herst, Lawrence, M.D. (1984)  
*Clinical Assistant Professor of Psychiatry*
- Hession, Katharine, M.D. (1981)  
*Clinical Instructor in Pediatrics*
- Hewitt, Francis R., M.A. (1970)  
*Associate Professor of Art*
- Hiebert, Clement A., M.D. (1982)  
*Clinical Associate Professor of Surgery*
- Higgins, Charles W., Jr., M.D. (1983)  
*Clinical Instructor in Anesthesiology*
- Higgins, Daniel W., M.F.A. (1969)  
*Associate Professor of Art*
- Higgins, George L., III, M.D. (1985)  
*Clinical Associate Professor of Surgery*
- Higgins, Stephen T., Ph.D. (1986)  
*Research Assistant Professor of Psychiatry*
- Hilberg, Raul, L.H.D., Ph.D. (1956)  
*McCullough Professor of Political Science*
- Hilfrank, Brenda C., B.S. (1982)  
*Clinical Assistant Professor of Orthopaedics and Rehabilitation*

- Hill, Douglas R., M.D. (1981)  
*Clinical Associate Professor of Family Practice*
- Hill, H. Charles, D.D.S. (1972)  
*Associate Professor of Dental Hygiene*
- Hill, Jacqueline L., M.S. (1973)  
*Lecturer in Computer Science*
- Hillman, Donald F., Ph.D. (1973)  
*Associate Professor of Psychiatry*
- Hillman, Robert S., M.D. (1981)  
*Professor of Medicine*
- Hindes, J. Churchill, Ph.D. (1975)  
*Clinical Assistant Professor of Medicine*
- Hirsch, David I., M.D. (1976)  
*Clinical Instructor in Medicine*
- Hirth, David H., Ph.D. (1979)  
*Associate Professor of Natural Resources*
- Hochheiser, Louis I., M.D. (1984)  
*Professor of Family Practice*
- Hochheiser, R. Margaret, M.A. (1987)  
*Clinical Instructor in Psychiatry*
- Hock, Michael L., M.Ed. (1987)  
*Lecturer in Special Education, Social Work, and Social Services*
- Hodgkin, William E., M.D. (1978)  
*Clinical Associate Professor of Pediatrics*
- Hoffmann, James P., Ph.D. (1983)  
*Lecturer in Botany*
- Hofmann, Michael P., M.D. (1987)  
*Clinical Assistant Professor of Pediatrics*
- Hohmann, Manfred J., M.D. (1987)  
*Visiting Professor of Obstetrics and Gynecology*
- Holland, Kenneth M., Ph.D. (1980)  
*Associate Professor of Political Science*
- Hollister, William H., M.Div. (1986)  
*Adjunct Associate Professor of Natural Resources and Environmental Studies*
- Holm, J. Lorimer, M.D. (1966)  
*Assistant Professor of Radiology*
- Holmes, David R., Ph.D. (1974)  
*Associate Professor of Organizational, Counseling, and Foundational Studies*
- Holmes, Frederick C., M.D. (1974)  
*Clinical Assistant Professor of Pediatrics*
- Holmgren, Karin, M.A. (1985)  
*Adjunct Lecturer in Communication Science and Disorders*
- Holstun, James R., Ph.D. (1986)  
*Assistant Professor of English*
- Holt, Louise C., M.S. (1988)  
*Extension Instructor in Extension Service*
- Honnold, Robert E., Ed.D. (1974)  
*Extension Professor in Extension Service*
- Hood, Kenneth W., Ed.D. (1979)  
*Assistant Professor of Organizational, Counseling, and Foundational Studies*
- Hood, Virginia L., M.B., B.S. (1977)  
*Associate Professor of Medicine*
- Horbar, Jeffrey D., M.D. (1981)  
*Associate Professor of Pediatrics*
- Horton, Edward S., M.D. (1967)  
*Professor of Medicine*
- Hotelling, David R., M.D. (1981)  
*Clinical Instructor in Medicine*
- Houghton, Martha, Ed.M. (1970)  
*Lecturer in Communication Science and Disorders*
- Howard, Paula R., M.S. (1985)  
*Assistant Professor of Medical Technology*
- Howard, Phillip L., M.D. (1969)  
*Professor of Pathology*
- Howe, James G., M.D. (1978)  
*Associate Professor of Orthopaedics and Rehabilitation*
- Howe, James R., IV, Ph.D. (1964)  
*Professor of English*
- Howell, David C., Ph.D. (1967)  
*Professor of Psychology*
- Howell, Douglas A., M.D. (1981)  
*Clinical Assistant Professor of Medicine*
- Howland, William G., Ph.D. (1982)  
*Research Assistant Professor of Geography*
- Hsieh, Alexander, Ph.D. (1986)  
*Adjunct Professor of Animal Sciences*
- Hubbard, John L., Ph.D. (1984)  
*Assistant Professor of Chemistry*
- Hubbell, Richard N., M.D. (1986)  
*Assistant Professor of Surgery and Pediatrics*
- Huber, Sally A., Ph.D. (1981)  
*Assistant Professor of Pathology*
- Huddle, David R., M.F.A. (1971)  
*Professor of English*
- Hudspeth, Thomas R., Ph.D. (1972)  
*Associate Professor of Natural Resources and Environmental Studies*
- Hughes, Garrett A., M.S. (1985)  
*Lecturer in Computer Science*
- Hughes, John R., M.D. (1985)  
*Professor of Psychiatry and Psychology*
- Hull, Marc E., Ph.D. (1987)  
*Visiting Associate Professor of Special Education, Social Work, and Social Services*
- Hulsen, Jeanne E., M.Ed. (1984)  
*Lecturer in Human Development Studies*
- Hummel, John W., Ph.D. (1983)  
*Assistant Professor of Business Administration*
- Hundal, Mahendra S., Ph.D. (1967)  
*Professor of Mechanical Engineering*
- Hunt, Allen S., Ph.D. (1961)  
*Professor of Geology*
- Hunt, Herbert G., III, D.B.A. (1987)  
*Assistant Professor of Business Administration*
- Hunt, Lyman C., Jr., D.Ed. (1966)  
*Professor of Professional Education and Curriculum Development*
- Hunter, Deborah E., Ph.D. (1985)  
*Assistant Professor of Organizational, Counseling, and Foundational Studies*
- Hunziker, Robert J., M.D. (1963)  
*Professor of Radiology*
- Huston, Dryver R., Ph.D. (1987)  
*Assistant Professor of Mechanical Engineering*
- Hutton, Patrick H., Ph.D. (1968)  
*Professor of History*
- Iannello, Kathleen P., M.A. (1986)  
*Visiting Instructor in Political Science*
- Ibragic-McCormick, Emima M., M.Sc. (1983)  
*Lecturer in Human Development Studies*
- Inglese, Catherine M., B.S. (1986)  
*Lecturer in Human Development Studies*
- Irwin, Alan E., M.D. (1977)  
*Assistant Professor of Surgery*
- Isaacson, J. Harry, M.D. (1987)  
*Instructor in Medicine*
- Isham, Betsy E., B.S. (1969)  
*Clinical Instructor in Medical Technology*
- Ishee, M. Nell, M.A. (1984)  
*Lecturer in Human Development Studies*
- Isler, Robert J., M.D. (1981)  
*Clinical Assistant Professor of Radiology*
- Isley, Elwood M., B.A. (1984)  
*Lecturer in Human Development Studies*
- Ittelman, Frank P., M.D. (1980)  
*Assistant Professor of Thoracic and Cardiac Surgery*
- Ives, John O., M.D. (1972)  
*Associate Professor of Psychiatry*
- Ives, Sally B., Ph.D. (1981)  
*Clinical Associate Professor of Psychiatry*

- Izzo, Louis M., M.S. (1969)  
*Associate Professor of Radiologic Technology*
- Jackson, Richard S., M.D. (1982)  
*Assistant Professor of Surgery*
- Jackson, Robert W., Ph.D. (1979)  
*Extension Associate Professor in Extension Service*
- Jackson, Thomas L., Ph.D. (1987)  
*Assistant Professor of Business Administration*
- Jacobsohn, Ulrich B., M.D. (1980)  
*Clinical Assistant Professor of Psychiatry*
- Jaffe, Julian J., Ph.D. (1961)  
*Professor of Pharmacology*
- Jameson, DeeDee M., Ph.D. (1968)  
*Assistant Professor of Human Development Studies*
- Janson, Richard H., Ph.D. (1958)  
*Professor of Art*
- Jarrell, Maureen A., M.D. (1986)  
*Assistant Professor of Obstetrics and Gynecology*
- Jarvis, Lynville W., M.A. (1967)  
*Extension Associate Professor in Extension Service*
- Jenkins, Wendy R., M.Ed. (1986)  
*Lecturer in Professional Education and Curriculum Development*
- Jesse, Richard R., Ph.D. (1983)  
*Associate Professor of Business Administration*
- Jewett, John G., Ph.D. (1977)  
*Professor of Chemistry*
- Jillson, David A., Ph.D. (1980)  
*Adjunct Assistant Professor of Zoology and Natural Resources*
- Joffe, Justin M., Ph.D. (1969)  
*Professor of Psychology*
- Johansson, Jan E., M.A. (1976)  
*Lecturer in Mathematics*
- Johnson, Beverly K., Ph.D. (1987)  
*Visiting Assistant Professor of Professional Nursing*
- Johnson, Charles L., M.D. (1980)  
*Clinical Assistant Professor of Psychiatry*
- Johnson, David L., M.D. (1979)  
*Associate Professor of Surgery*
- Johnson, Edward A., Jr., M.A. (1984)  
*Extension Assistant Professor in Extension Service*
- Johnson, Joel M., III, M.D. (1982)  
*Clinical Assistant Professor of Surgery*
- Johnson, Melissa F., M.S. (1985)  
*Lecturer in Professional Nursing*
- Johnson, Robert E., M.D., D.Phil. (1985)  
*Visiting Professor of Physiology and Biophysics*
- Johnson, Robert J., M.D. (1971)  
*Professor of Orthopaedics and Rehabilitation*
- Johnson, Thomas M., M.A. (1975)  
*Lecturer in English*
- Johnston, Aubrey P., Ed.D. (1981)  
*Associate Professor of Organizational, Counseling, and Foundational Studies*
- Johnston, Hugh H., M.D. (1981)  
*Associate Professor of Medicine*
- Jokela, William E., Ph.D. (1985)  
*Extension Assistant Professor of Plant and Soil Science*
- Jordan, Barbara R., M.S. (1987)  
*Lecturer in Human Development Studies*
- Joy, Albert H., M.S. (1987)  
*Library Instructor in Bailey/Howe Library*
- Jozefowicz, Thaddeus H., M.D. (1983)  
*Clinical Assistant Professor of Neurology*
- Kaiser, Elizabeth T., M.Mus. (1987)  
*Lecturer in Music*
- Kalisch, Steven M., Ph.D. (1986)  
*Adjunct Assistant Professor of Psychology*
- Kapp, Bruce S., Ph.D. (1971)  
*Professor of Psychology*
- Karstens, Karla A., M.S. (1987)  
*Lecturer in Mathematics*
- Kaseoru, Peter W., M.S. (1985)  
*Extension Assistant Professor in Extension Service*
- Kaupilla, Dennis M., M.S. (1983)  
*Extension Instructor in Extension Service*
- Keane, Nancy J., M.L.S. (1979)  
*Library Assistant Professor in Bailey/Howe Library*
- Keilson, Leonard, M.D. (1981)  
*Associate Professor of Medicine*
- Keiser, Kimberly A., M.A. (1988)  
*Lecturer in Special Education, Social Work, and Social Services*
- Keleher, Kathleen C., M.P.H. (1979)  
*Clinical Assistant Professor in Obstetrics and Gynecology*
- Kelleher, Philip C., M.D. (1963)  
*Associate Professor of Medicine*
- Keller, Gary A., M.D. (1986)  
*Clinical Instructor in Psychiatry*
- Kelley, Jason, M.D. (1977)  
*Adjunct Professor of Medicine*
- Kelly, William H., Ph.D. (1969)  
*Associate Professor of Vocational Education and Technology*
- Kennedy, Jane E., M.D. (1987)  
*Clinical Instructor in Medicine*
- Kent, Brian P., B.A. (1984)  
*Lecturer in English*
- Kent, Samuel S., Jr., Ph.D. (1981)  
*Research Associate Professor of Agricultural Biochemistry*
- Kent, Stanley, M.D. (1980)  
*Clinical Professor of Obstetrics and Gynecology*
- Keogh, William J., M.A. (1978)  
*Assistant Professor of Special Education, Social Work, and Social Services*
- Kessler, Dale L., Jr., M.D., Ph.D. (1985)  
*Clinical Assistant Professor of Pediatrics*
- Kessler, Marc, Ph.D. (1969)  
*Associate Professor of Psychology*
- Keyssar, Alexander, M.D. (1971)  
*Clinical Associate Professor of Medicine*
- Kiedaisch, Jean L., M.A. (1982)  
*Lecturer in English*
- Kiernan, James H., Jr., B.S. (1981)  
*Clinical Assistant Professor of Radiologic Technology*
- Kilpatrick, C. William, Ph.D. (1974)  
*Associate Professor of Zoology*
- Kindstedt, Paul S., Ph.D. (1986)  
*Assistant Professor of Animal Sciences*
- King, John F., M.D. (1980)  
*Clinical Assistant Professor of Psychiatry*
- King, Leslie A., Ph.D. (1984)  
*Assistant Professor of Natural Resources and Environmental Studies*
- Kirk, Barbara C., M.A. (1982)  
*Adjunct Instructor in Communication Science and Disorders*
- Kita, Michael W., M.D. (1986)  
*Instructor in Family Practice*
- Kleh, Thomas R., M.D. (1965)  
*Clinical Associate Professor of Ophthalmology*
- Klein, Richard M., Ph.D. (1967)  
*Professor of Botany*
- Klein, Stephen R., M.D. (1982)  
*Clinical Assistant Professor of Surgery*
- Kleppinger, D. Dale, Ph.D. (1986)  
*Lecturer in Electrical Engineering*
- Klette, Douglas G., M.Ed. (1988)  
*Adjunct Lecturer in Organizational, Counseling, and Foundational Studies*
- Klimowski, Steven E., A.S. (1980)  
*Lecturer in Music*
- Klopp, Donald W., M.D. (1983)  
*Professor of Anesthesiology*

- Knapp, Burton, M.D. (1981)  
*Clinical Associate Professor of Family Practice*
- Knapp, Raymond L., Ph.D. (1987)  
*Lecturer in Music*
- Knight, Stephen C., M.S. (1973)  
*Adjunct Professor of Civil Engineering*
- Knodell, Jane E., Ph.D. (1986)  
*Assistant Professor of Economics*
- Knowland, Michael, M.B., B.S. (1987)  
*Clinical Assistant Professor of Otolaryngology*
- Knowles, John E., M.D. (1982)  
*Clinical Associate Professor of Surgery*
- Koenemann, Edward J., M.S. (1981)  
*Lecturer in Natural Resources*
- Koerner, Herbert J., M.D. (1986)  
*Clinical Assistant Professor of Radiology*
- Koktowski, Wendy A., M.S. (1988)  
*Clinical Instructor in Medical Technology*
- Kolodinsky, Jane M., Ph.D. (1987)  
*Assistant Professor of Merchandising, Consumer Studies, and Design*
- Koplewitz, Martin J., M.D. (1973)  
*Associate Professor of Surgery*
- Kornblith, Hilary, Ph.D. (1979)  
*Associate Professor of Philosophy*
- Kornecki, Elizabeth H., Ph.D. (1983)  
*Research Assistant Professor of Psychiatry*
- Korsen, Neil, M.D. (1986)  
*Instructor in Family Practice*
- Korson, Roy, M.D. (1951)  
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- Kost, Larry L., M.S. (1973)  
*Lecturer in Mathematics*
- Kowpak, Corinne P., M.Ed. (1979)  
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- Krag, Martin H., M.D. (1981)  
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*Clinical Assistant Professor of Surgery*
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- Krawisz, Bruce R., M.D. (1984)  
*Assistant Professor of Pathology*
- Krawitt, Edward L., M.D. (1969)  
*Professor of Medicine*
- Krishnaswamy, Sriram, Ph.D. (1987)  
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- Kristensen, Eva A., M.D. (1983)  
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- Kristiansen, Thomas K., M.D. (1983)  
*Assistant Professor of Orthopaedics and Rehabilitation*
- Krueger, John W., Ph.D. (1985)  
*Visiting Assistant Professor of History*
- Krusinski, Paul A., M.D. (1974)  
*Professor of Medicine*
- Kuehne, Martin E., Ph.D. (1961)  
*Professor of Chemistry*
- Kufflik, Arthur, Ph.D. (1979)  
*Associate Professor of Philosophy*
- Kuhlmann, Raymond F., M.D. (1948)  
*Clinical Professor of Orthopaedics and Rehabilitation*
- Kunin, Arthur S., M.D. (1964)  
*Professor of Medicine*
- Kunkle, Edward C., M.D. (1987)  
*Associate Professor of Neurology*
- Kunkle, John R., D.V.M. (1977)  
*Extension Associate Professor of Animal Sciences*
- Kupic, Edward A., M.D. (1966)  
*Professor of Radiology*
- Kurkjian, Karen, M.D. (1987)  
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- Kusiak, Edward T., M.Ed. (1969)  
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- LaBar, George W., Ph.D. (1976)  
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- Lachapelle, Rene C., Ph.D. (1974)  
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- Laclair, Jeanne L., M.Ed. (1987)  
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- Lacroix, Lydia H., M.S. (1976)  
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- Lahar, Stephanie A., M.A. (1987)  
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- Laible, Jeffrey P., Ph.D. (1974)  
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- Lambert, Denis E., M.A.T. (1964)  
*Assistant Professor of Human Development Studies*
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- Lambrew, Costas T., M.D. (1981)  
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- Lamora, Christine M., M.S. (1982)  
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- Lampert, S. Henry, D.D.S. (1986)  
*Clinical Instructor in Dentistry*
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- Landesman, Richard H., Ph.D. (1969)  
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- Lang, Helene W., Ed.D. (1967)  
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- Langburd, Alan B., M.D. (1987)  
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- Lange, Janice L., M.S. (1967)  
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- Lavalette, Robert A. (1981)  
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- Lawlor, John C., M.S. (1974)  
*Lecturer in Mathematics and Statistics*
- Lawlor, Peter P., M.D. (1971)  
*Clinical Associate Professor of Ophthalmology*
- Lawrason, Peter, M.D. (1980)  
*Clinical Assistant Professor of Obstetrics and Gynecology*
- Lawson, Robert B., Ph.D. (1966)  
*Professor of Psychology*
- Leadbetter, Guy W., Jr., M.D. (1967)  
*Professor of Urology*
- Leclair, Joseph C., Jr., A.S.E. (1988)  
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- Lee, Austin P., M.B., Ch.B. (1984)  
*Clinical Associate Professor of Psychiatry*
- Lee, Donna K., M.L.S. (1985)  
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- Lee, Kathleen P., M.S. (1987)  
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- Lee, Kenneth R., M.D. (1979)  
*Associate Professor of Pathology*
- Leeber, Donald A., M.D. (1981)  
*Associate Professor of Medicine*
- Leenstra, Willem R., Ph.D. (1980)  
*Associate Professor of Chemistry*
- Leff, Herbert L., Ph.D. (1970)  
*Associate Professor of Psychology*
- Leggett, Leslie R., D.P.Ed. (1962)  
*Professor of Human Development Studies*
- Leib, Edward S., M.D. (1979)  
*Clinical Assistant Professor of Medicine*
- Leitenberg, Harold, Ph.D. (1965)  
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- Leitner, David W., M.D. (1984)  
*Assistant Professor of Surgery*
- Lemieux, Michael C., M.D. (1987)  
*Instructor in Medicine*
- Lenox, Robert H., M.D. (1977)  
*Professor of Psychiatry*
- Lepage, John C., M.D. (1983)  
*Clinical Assistant Professor of Medicine*
- Leschey, William H., Jr., M.D. (1981)  
*Clinical Assistant Professor of Neurology*
- Leslie, Kevin O., M.D. (1986)  
*Assistant Professor of Pathology*
- Letourneau, Lowell S. (1969)  
*Clinical Instructor in Medical Technology*
- Letteri, Charles A., Ed.D. (1970)  
*Associate Professor of Human Development Studies*
- Levi, Paul A., Jr., D.M.D. (1971)  
*Assistant Professor of Dental Hygiene and Clinical Assistant Professor of Oral Surgery*
- Levitte, Richard A., M.E.Ed. (1980)  
*Extension Assistant Professor in Extension Service*
- Levy, Arthur M., M.D. (1963)  
*Professor of Medicine and Pediatrics*
- Lewin, Henia, M.Ed. (1983)  
*Lecturer in Hebrew*
- LeWinter, Martin N., M.D. (1985)  
*Professor of Medicine*
- Lewis, Barbara B., M.A.T. (1985)  
*Lecturer in Chemistry*
- Lewis, John D., M.D. (1968)  
*Associate Professor of Obstetrics and Gynecology*
- Lewis, William J., Ph.D. (1954)  
*Professor of Sociology*
- Liebmann, Wolfgang K., Ph.D. (1987)  
*Visiting Professor of Electrical Engineering*
- Liebs, Chester H., M.S. (1975)  
*Professor of History*
- Liggett, Annette M., E.Ed. (1985)  
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- Liggett, Lee B., J.D. (1987)  
*Assistant Professor of Organizational, Counseling, and Foundational Studies*
- Lind, Aulis, Ph.D. (1970)  
*Associate Professor of Geography*
- Lindsay, John J., Ph.D. (1964)  
*Associate Professor of Natural Resources*
- Linn, Audrey A., M.S. (1979)  
*Clinical Instructor in Obstetrics and Gynecology*
- Lintilhac, Philip M., Ph.D. (1976)  
*Research Associate Professor of Botany*
- Linton, Peter C., M.D. (1964)  
*Assistant Professor of Surgery*
- Lipke, William C., Ph.D. (1970)  
*Associate Professor of Art*
- Lipson, Marjorie Y., Ph.D. (1985)  
*Associate Professor of Professional Education and Curriculum Development*
- Lipson, Richard L., M.D. (1963)  
*Clinical Associate Professor of Medicine*
- Little, David N., M.D. (1978)  
*Associate Professor of Family Practice*
- Livak, Joyce, Ph.D. (1966)  
*Associate Professor of Nutritional Sciences*
- Lockwood, Julia D., M.D. (1985)  
*Clinical Instructor in Pediatrics*
- Loewen, James W., Ph.D. (1975)  
*Professor of Sociology*
- Loizzo, M. Jerome, M.D. (1985)  
*Clinical Assistant Professor of Psychiatry*
- Loker, Suzanne, Ph.D. (1981)  
*Associate Professor of Merchandising, Consumer Studies, and Design*
- Lollar, John S., M.D. (1984)  
*Assistant Professor of Medicine and Biochemistry*
- London, Marshall G., M.D. (1970)  
*Clinical Associate Professor of Medicine*
- Long, George L., Ph.D. (1986)  
*Associate Professor of Biochemistry*
- Long, John G., D.D.S. (1978)  
*Assistant Professor of Dental Hygiene*
- Long, John G., M.D. (1979)  
*Clinical Instructor in Pediatrics*
- Lopez, Debra A., M.D. (1983)  
*Clinical Instructor in Psychiatry*
- Lorenz, Gifford W., M.D. (1987)  
*Instructor in Medicine*
- Losey, Lawrence J., M.D. (1980)  
*Clinical Assistant Professor of Pediatrics*
- Love, John C., M.D. (1985)  
*Clinical Assistant Professor of Medicine*
- Lovely, David K., M.D. (1982)  
*Clinical Associate Professor of Surgery*
- Low, Robert B., Ph.D. (1970)  
*Professor of Physiology and Biophysics*
- Lu, Tswai-ing, B.A. (1987)  
*Lecturer in History*
- Lubker, James F., Ph.D. (1984)  
*Professor of Communication Science and Disorders*
- Luce, Stephen C., Ph.D. (1986)  
*Adjunct Assistant Professor of Professional Education and Curriculum Development*
- Lucey, Jerold, F., M.D. (1956)  
*Professor of Pediatrics*

- Ludewig, Victor W., M.D. (1973)  
*Clinical Associate Professor of Medicine*
- Luginbuhl, William H., M.D. (1960)  
*Professor of Pathology*
- Luke, Barbara A., M.D. (1981)  
*Clinical Assistant Professor of Radiology*
- Luke, Robert L., III, M.D. (1981)  
*Clinical Assistant Professor of Pathology*
- Lunde, John H., M.D. (1987)  
*Clinical Assistant Professor of Pathology*
- Luria, Scott D., M.D. (1987)  
*Assistant Professor of Medicine*
- Lutes, Chris A., M.D. (1982)  
*Clinical Assistant Professor of Surgery*
- Lyman, Theodore, M.F.A. (1983)  
*Assistant Professor of Art*
- Lynch, David W., M.D. (1982)  
*Clinical Assistant Professor of Pediatrics*
- Lyng, Marla C., D.V.M. (1981)  
*Research Assistant Professor of Animal Sciences*
- Lyon, G. Reid, Ph.D. (1983)  
*Adjunct Associate Professor of Communication Science and Disorders and Clinical Associate Professor of Neurology*
- MacCollom, George B., Ph.D. (1954)  
*Professor of Plant and Soil Science*
- MacDonald, Linda B., M.S. (1983)  
*Library Assistant Professor in Bailey/Howe Library*
- Machado, Priscilla H., Ph.D. (1987)  
*Assistant Professor of Political Science*
- MacKillop, John A., Jr., B.S. (1977)  
*Extension Instructor in Extension Service*
- MacLaughlin, Winthrop S., Jr., M.D. (1982)  
*Clinical Assistant Professor of Surgery*
- MacLeod, Cathel A., M.B., B.Ch. (1981)  
*Clinical Assistant Professor of Medicine*
- MacPherson, Brian V., M.S. (1980)  
*Lecturer in Statistics*
- MacPherson, Bruce R., M.D. (1974)  
*Associate Professor of Pathology*
- Maddox, David A., Ph.D. (1980)  
*Research Associate Professor of Medicine, Physiology and Biophysics and Instructor in Medicine*
- Madison, James F., M.D. (1964)  
*Clinical Professor of Medicine*
- Madison, Joan G., M.D. (1972)  
*Clinical Assistant Professor of Medicine*
- Magdoff, Frederick R., Ph.D. (1973)  
*Professor of Plant and Soil Science*
- Magistrale, Anthony S., Ph.D. (1981)  
*Assistant Professor of English*
- Magrane, Diane M., M.D. (1986)  
*Assistant Professor of Obstetrics and Gynecology*
- Maguire, Eleanor L., M.S. (1986)  
*Visiting Instructor in Technical Nursing*
- Maguire, Kathleen J., M.D. (1980)  
*Assistant Professor of Surgery*
- Mahler, Gregory S., Ph.D. (1978)  
*Associate Professor of Political Science*
- Mahoney, Dennis F., Ph.D. (1979)  
*Associate Professor of German*
- Mahoney, Patrick J., M.D. (1978)  
*Clinical Associate Professor of Orthopaedics and Rehabilitation*
- Mahoney, Richard J., Ph.D. (1984)  
*Assistant Professor of Medicine*
- Maier, James H., M.D. (1982)  
*Clinical Assistant Professor of Psychiatry*
- Maloney, Mary E., M.D. (1983)  
*Assistant Professor of Medicine*
- Manchel, Frank, Ed.D. (1967)  
*Professor of English*
- Mann, Jack P., Jr., M.D. (1980)  
*Clinical Assistant Professor of Pediatrics*
- Mann, Kenneth G., Ph.D. (1984)  
*Professor of Biochemistry*
- Mann, William E., Ph.D. (1974)  
*Professor of Philosophy*
- Manning, Robert E., Ph.D. (1976)  
*Professor of Natural Resources*
- Mardeusz, Patricia E., M.S. (1987)  
*Library Instructor in Bailey/Howe Library*
- Marek, Linda G., M.S. (1977)  
*Extension Assistant Professor of Natural Resources*
- Margolis, Carol A., M.S. (1983)  
*Lecturer in Plant and Soil Science*
- Mariak, Kathleen A., M.S. (1985)  
*Adjunct Assistant Professor of Professional Nursing*
- Marschke, Charles H., B.A. (1972)  
*Lecturer in Radiologic Technology*
- Martenis, Nancy S., M.A.T. (1986)  
*Lecturer in English*
- Martenis, Thomas W., M.D. (1966)  
*Clinical Associate Professor of Medicine*
- Martin, Herbert L., M.D. (1954)  
*Professor of Neurology*
- Martin, Luther H., Jr., Ph.D. (1967)  
*Professor of Religion*
- Martin, Thomas A., Jr., M.D. (1982)  
*Clinical Assistant Professor of Orthopaedics and Rehabilitation*
- Mason, Anne B., Ph.D. (1984)  
*Research Assistant Professor of Biochemistry*
- Massanari, David L., M.D. (1984)  
*Clinical Instructor in Family Practice*
- Massonneau, Suzanne, M.A. (1975)  
*Library Professor in Bailey/Howe Library*
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- Matthews, Edward C., M.D.C.M. (1980)  
*Clinical Associate Professor of Pediatrics*
- Maughan, David W., Ph.D. (1976)  
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- Maxwell, Robert A., Ph.D. (1962)  
*Visiting Professor of Pharmacology*
- Maxwell, Stephanie A., M.F.A. (1987)  
*Visiting Assistant Professor of Art*
- Maxwell, William H., M.D. (1982)  
*Clinical Assistant Professor of Surgery*
- Mayer, Jack L., M.D. (1978)  
*Clinical Instructor in Pediatrics*
- Mayer, Paul J., M.D. (1974)  
*Clinical Associate Professor of Medicine*
- Mazur, John R., M.D. (1973)  
*Clinical Assistant Professor of Obstetrics and Gynecology*
- Mazuzan, John E., M.D. (1959)  
*Professor of Anesthesiology*
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- McCann, B. Cairbre, M.B., B.Ch. (1981)  
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- McCann, Harold G., Ph.D. (1974)  
*Associate Professor of Sociology*
- McCann, William J., M.A. (1985)  
*Clinical Instructor in Psychiatry*
- McCarthy, Edward A., Jr., M.D. (1980)  
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*Clinical Instructor in Radiologic Technology*
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- McConaughy, Stephanie H., Ph.D. (1981)  
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- McCormack, John J., Jr., Ph.D. (1966)  
*Professor of Pharmacology*
- McCormick, Thomas E., J.D. (1980)  
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- McCran, Donald J., Jr., M.D. (1980)  
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- McCrate, Elaine, Ph.D. (1985)  
*Assistant Professor of Economics*
- McCrorey, H. Lawrence, Ph.D. (1966)  
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- McDay, John B., M.D. (1980)  
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- McKenzie, Hugh S., Ph.D. (1967)  
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- McNeil, George N., M.D. (1980)  
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*Assistant Professor of Neurology*
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*Assistant Professor of Surgery*
- Mead, Philip B., M.D. (1971)  
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- Meeker, C. Irving, M.D. (1980)  
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- Meeks, Harold A., Ph.D. (1964)  
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- Mehalic, Thomas F., M.D. (1982)  
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*Associate Professor of Geology*
- Mekkelsen, Jane E., C.A.S. (1987)  
*Lecturer in Professional Education and Curriculum Development*
- Mercier, Susan M., M.Ed. (1974)  
*Lecturer in Dental Hygiene*
- Mesrobian, Robert B., M.D. (1987)  
*Clinical Assistant Professor of Anesthesiology*
- Metcalfe, Marion E., B.A. (1966)  
*Lecturer in Music*
- Metcalfe, William C., Ph.D. (1963)  
*Professor of History*
- Meunier, Jerome J., A.S. (1982)  
*Clinical Instructor in Medical Technology*
- Meyer, Diane H., Ph.D. (1985)  
*Research Associate in Medicine*
- Meyer, William L., Ph.D. (1962)  
*Professor of Biochemistry*
- Meyers, Herman W., Ph.D. (1971)  
*Associate Professor of Organizational, Counseling, and Foundational Studies*
- Mickey, Ruth M., Ph.D. (1984)  
*Assistant Professor of Statistics*
- Mieder, Wolfgang, Ph.D. (1971)  
*Professor of German*
- Miles, Edward J., Ph.D. (1962)  
*Professor of Geography*
- Milhous, Raymond L., M.D. (1968)  
*Professor of Orthopaedics and Rehabilitation*
- Miller, Albert A., M.D. (1987)  
*Clinical Instructor in Medicine*
- Miller, Buell A., M.D. (1980)  
*Clinical Professor of Obstetrics and Gynecology*
- Miller, Carol T., Ph.D. (1979)  
*Associate Professor of Psychology*
- Miller, Donald B., Jr., M.D. (1976)  
*Clinical Assistant Professor of Family Practice*
- Miller, Frederick S., M.D. (1987)  
*Clinical Assistant Professor of Ophthalmology*
- Miller, J. Daniel, M.D. (1980)  
*Clinical Assistant Professor of Pediatrics*
- Miller, Marc L., M.D. (1984)  
*Clinical Assistant Professor of Medicine*
- Miller, Willard M., Ph.D. (1969)  
*Assistant Professor of Philosophy*
- Mills, Scott D., M.D. (1987)  
*Instructor in Medicine*
- Milne, James R., M.D. (1978)  
*Clinical Instructor in Pediatrics*
- Milne, John H., M.D. (1962)  
*Clinical Associate Professor of Medicine*

- Mincher, Diane E., M.S. (1987)  
*Extension Assistant Professor in Extension Service*
- Mindell, Howard J., M.D. (1967)  
*Professor of Radiology*
- Mintz, Beth, Ph.D. (1977)  
*Associate Professor of Sociology*
- Mirchandani, Gagan, Ph.D. (1968)  
*Professor of Electrical Engineering*
- Miser, Keith M., Ed.D. (1971)  
*Assistant Professor of Organizational, Counseling, and Foundational Studies*
- Mitchell, John J., Ph.,D. (1987)  
*Research Assistant Professor of Physiology and Biophysics*
- Mitchell, William E., Ph.D. (1965)  
*Professor of Anthropology*
- Mixer, Richard A., M.B.A. (1986)  
*Lecturer in Natural Resources*
- Moehring, Joan M., Ph.D. (1973)  
*Research Professor of Microbiology*
- Moehring, Thomas J., Ph.D. (1968)  
*Professor of Microbiology*
- Moffroid, Mary S., Ph.D. (1972)  
*Associate Professor of Physical Therapy*
- Mogan, James V., M.D. (1980)  
*Associate Professor of Orthopaedics and Rehabilitation*
- Mohler, Beth A., M.Ed. (1982)  
*Lecturer in Professional Education and Curriculum Development*
- Molind, Samuel E., D.M.D. (1972)  
*Clinical Assistant Professor of Oral Surgery and Instructor in Dental Hygiene*
- Moller, Kenneth, M.D. (1982)  
*Clinical Assistant Professor of Orthopaedics and Rehabilitation*
- Monahan, John D., Jr., J.D. (1986)  
*Lecturer in Business Administration*
- Mongeon, Maurice E., M.D. (1964)  
*Clinical Assistant Professor of Medicine*
- Montinieri, Paul F., M.Ed. (1986)  
*Lecturer in Organizational, Counseling, and Foundational Studies*
- Moore, Molly F., M.A. (1976)  
*Lecturer in English*
- More, Thomas A., Ph.D. (1987)  
*Adjunct Associate Professor of Natural Resources*
- Moreland, Morey S., M.D. (1973)  
*Professor of Orthopaedics and Rehabilitation*
- Morency, David C., M.A. (1973)  
*Lecturer in Mathematics*
- Morgan, Chris L., B.S. (1981)  
*Clinical Instructor in Medical Technology*
- Morris, Charles, D., Ph.D. (1987)  
*Adjunct Assistant Professor of Psychology*
- Morris, James W., Ph.D. (1983)  
*Assistant Professor of Civil Engineering*
- Morris, Jonathan E., M.P.H. (1987)  
*Clinical Assistant Professor of Psychiatry*
- Morrisseau, Paul M., M.D. (1970)  
*Associate Professor of Urology*
- Morrow, Doreen L., M.D. (1984)  
*Clinical Assistant Professor of Pediatrics*
- Morrow, Paul L., M.D. (1981)  
*Clinical Assistant Professor of Pathology*
- Morse, Mary O., M.D. (1981)  
*Clinical Assistant Professor of Medicine*
- Morse, Robert L., M.D. (1985)  
*Clinical Assistant Professor of Medicine*
- Morton, Jeremy R., M.D. (1982)  
*Clinical Assistant Professor of Surgery*
- Moseley, Thomas A., III, M.D. (1983)  
*Clinical Instructor in Pediatrics*
- Moser, Donald E., Ph.D. (1960)  
*Professor of Mathematics*
- Mossman, Brooke T., Ph.D. (1975)  
*Associate Professor of Pathology*
- Moynihan, Michael J., M.D. (1966)  
*Clinical Professor of Medicine*
- Moyser, George H., Ph.D. (1987)  
*Associate Professor of Political Science*
- Muhr, Diane I., M.S. (1982)  
*Adjunct Instructor in Communication Science and Disorders*
- Mulieri, Louis A., Ph.D. (1975)  
*Research Associate Professor of Physiology and Biophysics*
- Mullens, Russell A., Ph.D. (1982)  
*Lecturer in Professional Education and Curriculum Development*
- Murad, Joanne, B.A. (1983)  
*Lecturer in Romance Languages*
- Murad, Timothy, Ph.D. (1971)  
*Associate Professor of Romance Languages*
- Murphy, Owen J., Ph.D. (1985)  
*Assistant Professor of Computer Science*
- Murphy, Richard E., M.D. (1970)  
*Clinical Assistant Professor of Obstetrics and Gynecology*
- Murphy, William M., Ph.D. (1979)  
*Professor of Plant and Soil Science*
- Murray, Barbara L., M.S. (1968)  
*Associate Professor of Professional Nursing*
- Murray, John J., M.D. (1968)  
*Clinical Associate Professor of Pediatrics*
- Murray, Laurie R., M.S.N. (1986)  
*Visiting Assistant Professor of Professional Nursing*
- Murray, Robert W., M.D. (1982)  
*Clinical Assistant Professor in Family Practice*
- Musiek, Frank E., Ph.D. (1982)  
*Adjunct Associate Professor of Communication Science and Disorders*
- Musty, Richard E., Ph.D. (1968)  
*Professor of Psychology*
- Myers, John L., M.D. (1984)  
*Clinical Instructor in Medicine*
- Myott, Lawrence B., B.S. (1975)  
*Extension Instructor in Extension Service*
- Nagle, Ellen S., M.A. (1984)  
*Library Professor in Dana Medical Library*
- Nahra, Nancy A., M.A. (1983)  
*Lecturer in Romance Languages*
- Najarian, Kenneth E., M.D. (1985)  
*Assistant Professor of Radiology*
- Nakajima, Steven T., M.D. (1986)  
*Instructor in Obstetrics and Gynecology*
- Nalette, Joseph E., M.Ed. (1975)  
*Clinical Assistant Professor of Physical Therapy*
- Nalibow, Kenneth L., Ph.D. (1970)  
*Associate Professor of Russian*
- Narkewicz, Richard M., M.D. (1966)  
*Clinical Professor of Pediatrics*
- Nash, Robert J., Ed.D. (1969)  
*Professor of Organizational, Counseling, and Foundational Studies*
- Nedde, William H., Jr., D.P.E. (1967)  
*Lecturer in Human Development Studies*
- Neiweem, David, Ph.D. (1982)  
*Assistant Professor of Music*
- Nelson, Garrison, Ph.D. (1968)  
*Associate Professor of Political Science*
- Nelson, Leonie A., M.S. (1974)  
*Clinical Assistant Professor of Physical Therapy*
- Nelson, Mark A., Ph.D. (1984)  
*Assistant Professor of Music*
- Nelson, Mark T., Ph.D. (1986)  
*Assistant Professor of Pharmacology*

- Neuser, Gary F., M.A. (1985)  
*Assistant Professor of Military Studies*
- Nevin, Ann I., Ph.D. (1970)  
*Professor of Special Education, Social Work, and Social Services*
- Newhart, Robert II, M.C.P. (1985)  
*Extension Assistant Professor in Extension Service*
- Newhouse, Paul A., M.D. (1987)  
*Clinical Assistant Professor of Psychiatry*
- Newton, Carlton M., Ph.D. (1973)  
*Associate Professor of Natural Resources*
- Nichols, Beverly A., Ph.D. (1971)  
*Associate Professor of Human Development Studies*
- Nichols, Claude E., M.D. (1985)  
*Assistant Professor of Orthopaedics and Rehabilitation*
- Nichols, Eric C., Ph.D. (1977)  
*Extension Associate Professor of Human Development Studies*
- Nicklas, Janice A., Ph.D. (1986)  
*Research Assistant Professor of Medicine and Instructor in Medicine*
- Niederbuhl, John M., Ph.D. (1987)  
*Adjunct Assistant Professor of Psychology*
- Nielsen, Gordon R., Ph.D. (1965)  
*Extension Assistant Professor of Plant and Soil Science*
- Nies, Alexander, M.D. (1987)  
*Clinical Professor of Psychiatry*
- Nieto, Daniel S., Ph.D. (1986)  
*Assistant Professor of Special Education, Social Work, and Social Services*
- Nishiyama, Ronald H., M.D. (1981)  
*Professor of Pathology*
- Nivola, Pietro S., Ph.D. (1977)  
*Associate Professor of Political Science*
- Nixon, Howard L., II, Ph.D. (1970)  
*Professor of Sociology*
- Northup, Christiane L., M.D. (1980)  
*Clinical Assistant Professor of Obstetrics and Gynecology*
- Novotny, Charles P., Ph.D. (1968)  
*Professor of Microbiology*
- O'Brien, Patrick F. (1975)  
*Instructor in Neurology*
- O'Brien, Robert E., M.D. (1955)  
*Clinical Associate Professor of Medicine*
- Oliaro, Paul M., M.A. (1980)  
*Assistant Professor of Organizational, Counseling, and Foundational Studies*
- Oliver, Kami, M.Ed. (1974)  
*Lecturer in Professional Education and Curriculum Development*
- Olson, James P., Ph.D. (1969)  
*Associate Professor of Civil Engineering*
- O'Neill, J. Patrick, Ph.D. (1983)  
*Research Associate Professor of Medicine and Instructor in Medicine*
- Oppenlander, Joseph C., Ph.D. (1969)  
*Professor of Civil Engineering*
- O'Rourke, Deborah A., M.Cl.Sc. (1987)  
*Clinical Assistant Professor of Physical Therapy*
- Orth, Ghita M., M.A. (1982)  
*Lecturer in English*
- Orth, Ralph H., Ph.D. (1959)  
*Professor of English*
- Ortiz, Maurico, M.D. (1986)  
*Research Associate in Physiology and Biophysics*
- Osborne, Steven F., M.D. (1981)  
*Clinical Instructor in Pediatrics*
- Osgood, David A., M.P.H. (1973)  
*Instructor in Professional Education and Curriculum Development*
- Osher, Harold L., M.D. (1981)  
*Associate Professor of Medicine*
- Osol, George J., Ph.D. (1983)  
*Assistant Professor of Obstetrics and Gynecology and Physiology and Biophysics*
- Ostell, James M., Ph.D. (1986)  
*Research Assistant Professor of Zoology*
- Otter, Timothy, Ph.D. (1986)  
*Assistant Professor of Zoology*
- Ouellett, Mathew L., M.A. (1986)  
*Lecturer in Organizational, Counseling, and Foundational Studies*
- Oughstun, Kurt E., Ph.D. (1987)  
*Associate Professor of Electrical Engineering*
- Outwater, John O., Ph.D., Sc.D., (1956)  
*Professor of Mechanical Engineering*
- Overfield, James H., Ph.D. (1968)  
*Professor of History*
- Owen, Elaine B., M.S.N. (1985)  
*Instructor in Professional Nursing*
- Owre, Brenda K., M.A. (1987)  
*Lecturer in English*
- Owre, Edwin M., M.F.A. (1969)  
*Associate Professor of Art*
- Packard, Andrew B., M.D. (1981)  
*Clinical Assistant Professor of Radiology*
- Pacy, James S., Ph.D. (1967)  
*Professor of Political Science*
- Paden, William E., Ph.D. (1965)  
*Associate Professor of Religion*
- Page, Gayle A., B.S. (1980)  
*Clinical Instructor in Medical Technology*
- Page, H. Gordon, M.D. (1954)  
*Professor of Surgery*
- Page, Lyman A., M.D. (1980)  
*Clinical Associate Professor of Pediatrics*
- Palacios, Luis C., (1987)  
*Instructor in Military Studies*
- Palmer, Heidi, B.A. (1981)  
*Lecturer in Music*
- Palmer, Mary Ellen, M.S. (1958)  
*Associate Professor of Professional Nursing*
- Pane, John A., A.B. (1986)  
*Clinical Instructor in Dentistry*
- Pankey, Joseph W., Jr., Ph.D. (1984)  
*Research Professor of Animal Sciences*
- Paolucci-Whitcomb, Phyllis E., Ed.D. (1970)  
*Associate Professor of Special Education, Social Work, and Social Services and Organizational, Counseling, and Foundational Studies*
- Park, David R., M.D. (1969)  
*Clinical Associate Professor of Medicine and Family Practice*
- Parke, Edward L., Ph.D. (1977)  
*Associate Professor of Business Administration*
- Parker, Bruce L., Ph.D. (1965)  
*Professor of Plant and Soil Science*
- Parker, Paul A., M.D. (1981)  
*Clinical Assistant Professor of Medicine*
- Parker, Sylvia B., M.M. (1979)  
*Lecturer in Music*
- Parshley, Alan O., M.M. (1983)  
*Lecturer in Music*
- Parsons, Chester F., B.S. (1985)  
*Extension Instructor in Extension Service*
- Parsons, Rodney L., Ph.D. (1967)  
*Professor of Anatomy and Neurobiology and Physiology and Biophysics*
- Pascoe, Jeffrey P., Ph.D. (1984)  
*Research Assistant Professor of Psychology*
- Pastner, Carroll, Ph.D. (1971)  
*Associate Professor of Anthropology*
- Pastner, Stephen L., Ph.D. (1970)  
*Associate Professor of Anthropology*

- Patlak, Joseph B., Ph.D. (1980)  
*Associate Professor of Physiology and Biophysics*
- Patterson, Thomas F., Jr., Ph.D. (1973)  
*Extension Associate Professor of Vocational Education and Technology*
- Pauk, George L., M.D. (1981)  
*Clinical Instructor in Medicine*
- Paulding, Stephen, M.D. (1981)  
*Clinical Assistant Professor of Family Practice*
- Pawle, Robert H., M.D. (1981)  
*Clinical Associate Professor of Family Practice*
- Peaper, Ruth E., M.Ed. (1983)  
*Clinical Instructor in Neurology*
- Pell, Alice N., Ph.D. (1984)  
*Assistant Professor of Animal Sciences*
- Pellett, Norman E., Ph.D. (1967)  
*Professor of Plant and Soil Science*
- Pelsue, Neil H., Jr., Ph.D. (1976)  
*Associate Professor of Agricultural and Resource Economics*
- Pembroke, Jane E., A.S. (1986)  
*Clinical Instructor in Radiologic Technology*
- Pendlebury, William W., Ph.D. (1984)  
*Assistant Professor of Pathology*
- Pennoyer, Douglas C., M.D. (1982)  
*Clinical Associate Professor of Surgery*
- Pereboom, Derk, Ph.D. (1985)  
*Assistant Professor of Philosophy*
- Periasamy, Muthu, Ph.D. (1985)  
*Assistant Professor of Physiology and Biophysics*
- Perkins, David L., M.D. (1970)  
*Assistant Professor of Anesthesiology*
- Perkins, Frederick M., M.D. (1980)  
*Assistant Professor of Anesthesiology*
- Perry, Leonard P., Ph.D. (1981)  
*Extension Assistant Professor of Plant and Soil Science*
- Peters, Wayne E., M.D. (1978)  
*Clinical Instructor in Pediatrics*
- Peterson, James A., Ed.D. (1966)  
*Professor of Organizational, Counseling, and Foundational Studies*
- Peterson, Paul R., B.A. (1985)  
*Extension Instructor in Extension Service*
- Peterson, Thomas C., M.D. (1986)  
*Assistant Professor of Family Practice*
- Peysner, Janis M., Ph.D. (1976)  
*Clinical Associate Professor of Psychology and Psychiatry*
- Pezzuti, Roger T., M.D. (1985)  
*Clinical Assistant Professor of Radiology*
- Phelps, Hugh M., M.D. (1981)  
*Clinical Associate Professor of Radiology*
- Phelps, Paulding, M.D. (1986)  
*Clinical Professor of Medicine*
- Philbin, Paul P., M.S. (1987)  
*Library Assistant Professor in Bailey/Howe Library*
- Philip, Alistair G., M.B., Ch.B. (1982)  
*Professor of Pediatrics*
- Phillips, Carol, M.F.A. (1987)  
*Lecturer in Art*
- Phillips, Carol F., M.D. (1968)  
*Professor of Pediatrics*
- Pierattini, Robert A., M.D. (1986)  
*Clinical Instructor in Psychiatry*
- Pierce, Judith A., M.A. (1987)  
*Lecturer in Human Development Studies*
- Pilcher, David B., M.D. (1969)  
*Professor of Surgery*
- Pintauro, Stephen J., Ph.D. (1981)  
*Associate Professor of Nutritional Sciences*
- Plante, Dennis A., M.D. (1983)  
*Assistant Professor of Medicine and Statistics and Computer Science*
- Podhajski, Blanche R., Ph.D. (1983)  
*Adjunct Instructor in Communication Science and Disorders*
- Poger, Sidney B., Ph.D. (1962)  
*Professor of English*
- Ponterio, Marie J., M.A. (1987)  
*Lecturer in Romance Languages*
- Ponzo, Zander, Ph.D. (1970)  
*Associate Professor of Organizational, Counseling, and Foundational Studies*
- Poos-Floyd, Mary I., Ph.D. (1987)  
*Adjunct Professor of Animal Sciences*
- Pope, Malcolm H., Ph.D. (1976)  
*Professor of Orthopaedics and Rehabilitation and Mechanical Engineering*
- Porensky, Richard S., M.D. (1981)  
*Clinical Assistant Professor of Pathology*
- Porter, Monica B., M.E.E. (1969)  
*Extension Associate Professor in Extension Service*
- Posey, Pamela A., Ph.D. (1984)  
*Assistant Professor of Business Administration*
- Potash, Milton, Ph.D. (1951)  
*Professor of Zoology*
- Powden, Charles O., B.S. (1981)  
*Clinical Instructor in Medical Technology*
- Power, Marjory W., Ph.D. (1974)  
*Associate Professor of Anthropology*
- Powers, Patricia A., Ph.D. (1972)  
*Associate Professor of Anatomy and Neurobiology*
- Pratt, William A., M.D. (1954)  
*Clinical Instructor in Medicine*
- Preston, Walter F., Jr., D.D.S., (1972)  
*Clinical Instructor in Dental Hygiene*
- Pricer, W. David, M.S. (1984)  
*Adjunct Professor of Electrical Engineering*
- Pringle, James O., M.D. (1982)  
*Clinical Assistant Professor of Surgery*
- Pringle, Jane P., M.D. (1981)  
*Clinical Instructor in Medicine*
- Pugh, Ann D., M.S.W. (1985)  
*Lecturer in Special Education, Social Work, and Social Services*
- Purchase, David M., B.A. (1986)  
*Clinical Instructor in Medical Technology*
- Purnell, William E., M.D. (1988)  
*Assistant Professor of Radiology*
- Pusch, Allen L., M.D. (1984)  
*Professor of Pathology*
- Puterbaugh, Holly B., M.S. (1971)  
*Lecturer in Mathematics*
- Pynchon, Carol S., B.A. (1984)  
*Extension Instructor in Extension Service*
- Raabe, Daniel S., M.D. (1975)  
*Clinical Associate Professor of Medicine*
- Racusen, David W., Ph.D. (1958)  
*Professor of Agricultural Biochemistry*
- Rainville, Nancy C., M.S.N. (1984)  
*Assistant Professor of Professional Nursing*
- Ramagopal, Krishnamurthy, A.B.D. (1987)  
*Instructor in Economics*
- Ramanathan, Ramamurthy, Ph.D. (1986)  
*Visiting Instructor in Mechanical Engineering*
- Ramsay, Allan M., M.D. (1980)  
*Associate Professor of Family Practice and Medicine*
- Rand, Peter W., M.D. (1981)  
*Assistant Professor of Medicine*
- Randall, John L., M.D.C.M. (1982)  
*Professor of Family Practice and Associate Professor of Pediatrics*
- Randolph, Frances L., Ph.D. (1987)  
*Research Assistant Professor of Psychology*

- Randy, Harry A., Jr., Ph.D. (1983)  
*Adjunct Professor of Animal Sciences*
- Rankin, Joanna M., Ph.D. (1980)  
*Associate Professor of Physics*
- Raper, Carlene A., Ph.D. (1983)  
*Research Associate Professor of Microbiology*
- Raphael, David, M.L.A. (1987)  
*Lecturer in Natural Resources*
- Rathbone, Charles, Ph.D. (1970)  
*Associate Professor of Professional Education and Curriculum Development*
- Rathbone McCuan, Eloise, Ph.D. (1982)  
*Associate Professor of Special Education, Social Work, and Social Services*
- Raths, James D., Ph.D. (1987)  
*Professor of Professional Education and Curriculum Development*
- Ratkovits, Bela L., M.D. (1974)  
*Associate Professor of Radiology*
- Ratkus, Victor L., D.D.S. (1976)  
*Clinical Instructor in Oral Surgery*
- Ratner, Shanna E., M.S. (1986)  
*Lecturer in Economics*
- Ratte, Charles A., Ph.D. (1981)  
*Adjunct Professor of Geology*
- Ray, Ferris S., M.D. (1982)  
*Clinical Associate Professor of Surgery*
- Read, Evelyn R., M.M. (1969)  
*Lecturer in Music*
- Read, Helen P., B.A. (1988)  
*Lecturer in Mathematics*
- Read, Thomas L., D.M.A. (1967)  
*Professor of Music*
- Reardon, Mildred A., M.D. (1971)  
*Clinical Associate Professor of Medicine*
- Record, Duane C., M.D. (1978)  
*Clinical Assistant Professor of Obstetrics and Gynecology*
- Reddy-Bradbee, Joyce A., (1986)  
*Clinical Instructor in Obstetrics and Gynecology*
- Reed, Brian V., Ph.D. (1982)  
*Associate Professor of Physical Therapy*
- Reed, J. Patrick, M.S. (1973)  
*Associate Professor of Medical Technology*
- Reed, Richard R., D.D.S. (1969)  
*Clinical Assistant Professor in Oral Surgery and Instructor in Dental Hygiene*
- Reidel, Carl H., Ph.D. (1972)  
*Professor of Natural Resources and Daniel Clarke Sanders Professor of Environmental Studies*
- Reimondi, Robert A., M.A. (1981)  
*Adjunct Instructor in Psychology*
- Reinhardt, Paul T., M.S. (1968)  
*Lecturer in Human Development Studies*
- Reiss, Paul J., M.D. (1986)  
*Assistant Professor of Family Practice*
- Reit, Ernest M., D.V.M., Ph.D. (1965)  
*Associate Professor of Pharmacology*
- Reit, Janet W., M.L.S. (1985)  
*Library Assistant Professor in Dana Medical Library*
- Ricci, John P., M.S. (1986)  
*Lecturer in Organizational, Counseling, and Foundational Studies*
- Rice, Kathleen L., M.S. (1986)  
*Lecturer in Organizational, Counseling, and Foundational Studies*
- Rice, Tom W., Ph.D. (1983)  
*Associate Professor of Political Science*
- Rich, Dayton A., A.S. (1986)  
*Clinical Instructor in Radiologic Technology*
- Richardson, George M., D.D.S. (1973)  
*Clinical Instructor in Oral Surgery*
- Richel, Veronica C., Ph.D. (1969)  
*Associate Professor of German*
- Riddick, Daniel H., Ph.D. (1985)  
*Professor of Obstetrics and Gynecology*
- Riechel, James W., M.D. (1983)  
*Clinical Associate Professor of Anesthesiology*
- Rimmer, Jeffrey M., M.D. (1981)  
*Associate Professor of Medicine*
- Rinder, Henry M., M.D. (1987)  
*Instructor in Medicine*
- Ring, B. Albert, M.D. (1959)  
*Professor of Radiology*
- Rioux, Stephen D., M.D. (1987)  
*Clinical Assistant Professor of Pediatrics*
- Rippa, S. Alexander, Ed.D. (1960)  
*Professor of Organizational, Counseling, and Foundational Studies*
- Ritchie, Robert F., M.D. (1985)  
*Professor of Medicine*
- Rittenhouse, Susan E., Ph.D. (1986)  
*Associate Professor of Biochemistry*
- Rizvi, Saiyid A., M.A. (1987)  
*Instructor in Economics*
- Robbins, David C., M.D. (1980)  
*Associate Professor of Medicine and Pharmacology*
- Roberts, John D., M.D. (1984)  
*Assistant Professor of Medicine*
- Robertson, Craig A., Ph.D. (1982)  
*Library Assistant Professor in Bailey/Howe Library*
- Robinson, Edward H., M.D. (1984)  
*Clinical Assistant Professor of Psychiatry*
- Robinson, Girard E., M.D. (1987)  
*Clinical Assistant Professor of Psychiatry*
- Robinson, Hugh P., M.D. (1982)  
*Clinical Assistant Professor of Surgery*
- Robison, Steven H., Ph.D. (1983)  
*Research Assistant Professor of Neurology*
- Rockefeller, Richard G., M.D. (1984)  
*Clinical Assistant Professor of Family Practice*
- Rodgers, Barbara S., Ph.D. (1979)  
*Associate Professor of Classics*
- Rodgers, Robert H., Ph.D. (1979)  
*Visiting Professor of Classics*
- Roe, Linda R., M.D. (1981)  
*Assistant Professor of Radiology*
- Roediger, John H., M.D. (1982)  
*Clinical Assistant Professor of Surgery*
- Rogers, Glenn F., M.S. (1982)  
*Extension Assistant Professor in Extension Service*
- Roland, Margaret, Ph.D. (1966)  
*Associate Professor of Art*
- Roland, Thomas A., M.D. (1978)  
*Associate Professor of Radiology*
- Romeyn, Dirk, M.D. (1967)  
*Clinical Assistant Professor of Obstetrics and Gynecology*
- Roomet, Andres, M.D. (1978)  
*Clinical Associate Professor of Neurology*
- Root, Jane C., M.A. (1986)  
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- Rosa, Alfred F., Ph.D. (1969)  
*Professor of English*
- Rosen, James C., Ph.D. (1976)  
*Associate Professor of Psychology and Clinical Assistant Professor of Psychiatry and Assistant Professor of Orthopaedics and Rehabilitation*
- Rosenfeld, Robert, M.Phil. (1987)  
*Adjunct Lecturer in Statistics*
- Rosmus, Stephen M., M.D. (1982)  
*Clinical Assistant Professor of Family Practice*
- Ross, Jane K., Ph.D. (1979)  
*Associate Professor of Nutritional Sciences*

- Ross, Susan M., M.A. (1979)  
*Lecturer in Theatre*
- Roth, Wilfred, Ph.D. (1964)  
*Research Professor of Orthopaedics and Rehabilitation*
- Rothblum, Esther D., Ph.D. (1982)  
*Associate Professor of Psychology*
- Rothwell, Kenneth S., Ph.D. (1970)  
*Professor of English*
- Rothwell, Marilyn G., B.S. (1973)  
*Clinical Instructor in Medicine*
- Rouillard, Linda M., M.A.T. (1985)  
*Lecturer in Romance Languages*
- Rowe, S. Ellen, B.S. (1970)  
*Extension Assistant Professor in Extension Service*
- Rowell, Gayle M., A.D. (1977)  
*Lecturer in Dental Hygiene*
- Rowland, Margaret S., M.D. (1981)  
*Clinical Instructor in Family Practice*
- Roy, Michael A., M.D. (1987)  
*Clinical Instructor in Medicine*
- Rubaud, Jeanne N., M.A. (1986)  
*Lecturer in Romance Languages*
- Rubin, Alan S., M.D. (1974)  
*Assistant Professor of Medicine*
- Rubman, Jeffrey W., M.D. (1974)  
*Clinical Assistant Professor of Medicine*
- Ruess, Johanna M., M.D. (1973)  
*Associate Professor of Orthopaedics and Rehabilitation*
- Runge, Carl F., M.D.C.M. (1969)  
*Associate Professor of Medicine*
- Ruoff, Paul A., M.D. (1978)  
*Associate Professor of Psychiatry*
- Rush, Stanley, Ph.D. (1962)  
*Professor of Electrical Engineering*
- Russell, Eleanor M., M.S. (1967)  
*Clinical Assistant Professor of Medical Technology*
- Russo, Joseph N., M.D. (1968)  
*Clinical Assistant Professor of Obstetrics and Gynecology*
- Rust, Charles B., M.D. (1948)  
*Clinical Professor of Orthopaedics and Rehabilitation*
- Rutkowski, Anthony A., Ph.D. (1985)  
*Research Assistant Professor of Microbiology*
- Ryan, Bonnie C., M.L.S. (1981)  
*Library Assistant Professor in Bailey/Howe Library*
- Ryan, Francis P., M.D. (1971)  
*Clinical Instructor in Pediatrics*
- Ryan, Joseph, M.L.S. (1981)  
*Library Assistant Professor in Bailey/Howe Library*
- Ryan, William J., M.D. (1970)  
*Clinical Associate Professor of Medicine and Family Practice*
- Ryder, Richard A., M.D. (1967)  
*Clinical Associate Professor of Medicine*
- Sachs, Thomas D., Ph.D. (1962)  
*Associate Professor of Physics*
- Saffer, Jeffrey M., M.D. (1981)  
*Clinical Assistant Professor of Family Practice*
- Sager, George F., M.D. (1982)  
*Clinical Associate Professor of Surgery*
- Saia, John J., M.D. (1980)  
*Associate Professor of Family Practice*
- Salembier, George B., M.Ed. (1980)  
*Lecturer in Special Education, Social Work, and Social Services*
- Salvo, Anthony F., M.D. (1981)  
*Clinical Associate Professor of Radiology*
- Sampson, Samuel F., Ph.D. (1972)  
*Professor of Sociology*
- Sanborn, Linda F., M.D. (1984)  
*Clinical Instructor in Family Practice*
- Sandoval, Dolores S., Ph.D. (1971)  
*Associate Professor of Professional Education and Curriculum Development*
- Sands, Jonathan W., Ph.D. (1986)  
*Assistant Professor of Mathematics*
- Santelli, Josephine J., P.D. (1987)  
*Lecturer in Romance Languages*
- Sato, Gordon H., Ph.D. (1985)  
*Adjunct Professor of Biochemistry*
- Saucier, John R., M.D. (1985)  
*Clinical Assistant Professor of Surgery*
- Saule, Mara R., M.L.S. (1985)  
*Library Assistant Professor in Bailey/Howe Library*
- Saunders, Norman, M.D. (1981)  
*Clinical Associate Professor of Medicine*
- Savadove, Maureen, M.D. (1980)  
*Clinical Instructor in Pediatrics*
- Savitt, Ronald, Ph.D. (1985)  
*Beckley Professor of Business Administration*
- Scafa, Gina A., M.S. (1984)  
*Adjunct Instructor in Communication Science and Disorders*
- Scanlon, Janet M., B.S. (1981)  
*Clinical Instructor in Medical Technology*
- Scannell, Elizabeth, Ph.D. (1985)  
*Extension Assistant Professor in Merchandising, Consumer Studies, and Design*
- Scarfone, Leonard M., Ph.D. (1963)  
*Professor of Physics*
- Schaeffer, Warren I., Ph.D. (1967)  
*Professor of Microbiology*
- Schall, Joseph J., Ph.D. (1980)  
*Associate Professor of Zoology*
- Schapiro, Howard M., M.D. (1987)  
*Assistant Professor of Anesthesiology*
- Schenk, William M., M.A. (1965)  
*Associate Professor of Theatre*
- Schepp, Kay F., Ed.D. (1974)  
*Assistant Professor of Organizational, Counseling, and Foundational Studies*
- Schirmer, William F., M.D. (1986)  
*Instructor in Family Practice*
- Schlenker, Eleanor D., Ph.D. (1975)  
*Associate Professor of Nutritional Sciences*
- Schlunk, Robin R., Ph.D. (1967)  
*Professor of Classics*
- Schmidt, Frederick E., Ph.D. (1970)  
*Associate Professor of Sociology*
- Schmokel, Wolfe W., Ph.D. (1965)  
*Professor of History*
- Schneider, Karen A., B.A. (1984)  
*Extension Instructor in Extension Service*
- Schneider, Kathleen M., M.F.A. (1986)  
*Lecturer in Art*
- Scholan, John V., M.D. (1982)  
*Clinical Assistant Professor of Family Practice*
- Schreckenberger, Helga, Ph.D. (1986)  
*Assistant Professor of German*
- Schroeter, Janet F., B.S. (1987)  
*Clinical Instructor in Medical Technology*
- Schultz, J. Donald, M.D. (1970)  
*Assistant Professor of Medicine*
- Schultz, Mark S., M.D. (1984)  
*Clinical Instructor in Psychiatry*
- Schwalb, Roberta B., M.A. (1958)  
*Associate Professor of Professional Nursing*
- Schwartz, Carla A., Ph.D. (1987)  
*Assistant Professor of Electrical Engineering*
- Schweitzer, Judith M., M.S. (1984)  
*Instructor in Technical Nursing*
- Scollins, Mary E., M.D. (1974)  
*Clinical Assistant Professor of Neurology*



- Scollins, Michael J., M.D. (1974)  
*Associate Professor of Pharmacology and Clinical  
Associate Professor of Medicine*
- Scoones, Victoria L., M.A. (1974)  
*Lecturer in Music*
- Scotton, David W., M.D. (1981)  
*Clinical Assistant Professor of Medicine*
- Scrase, David A., Ph.D. (1972)  
*Associate Professor of German*
- Secker-Walker, Roger H., M.B., B.Chir. (1981)  
*Professor of Medicine*
- See, Scott W., Ph.D. (1985)  
*Assistant Professor of History*
- Seitz, Christopher B., M.D. (1981)  
*Clinical Assistant Professor of Radiology*
- Sekerak, Robert J., M.S. (1972)  
*Library Associate Professor in Dana Medical Library*
- Sendak, Paul E., Ph.D. (1983)  
*Adjunct Associate Professor of Natural Resources*
- Senecal, Andre J., Ph.D. (1978)  
*Associate Professor of Romance Languages*
- Senghas, Dorothy C., M.S. (1981)  
*Library Assistant Professor in Bailey/Howe Library*
- Serrero, Ginette, Ph.D. (1986)  
*Adjunct Assistant Professor of Zoology*
- Sewall, Kate, M.D. (1983)  
*Clinical Associate Professor of Anesthesiology*
- Seybolt, Peter J., Ph.D. (1969)  
*Professor of History*
- Seyller, John W., Ph.D. (1986)  
*Assistant Professor of Art*
- Shapiro, Jeryl R., M.D. (1977)  
*Assistant Professor of Anesthesiology*
- Shapiro, Stanley M., M.D. (1985)  
*Clinical Assistant Professor of Medicine*
- Sharp, Gregory H., Ph.D. (1983)  
*Assistant Professor of Pathology*
- Shatos, Marie A., Ph.D. (1984)  
*Research Associate in Medicine*
- Shattuc, Jane M., Ph.D. (1987)  
*Visiting Assistant Professor of English*
- Shaw, Peter K., M.D. (1981)  
*Clinical Assistant Professor of Medicine*
- Shelton, Lawrence G., Ph.D. (1971)  
*Associate Professor of Human Development Studies*
- Shepherd, Allen G., III, Ph.D. (1965)  
*Professor of English*
- Shepp, Margaret A., M.D. (1981)  
*Clinical Instructor in Medicine*
- Sher, George A., Ph.D. (1974)  
*Professor of Philosophy*
- Sheridan, Patricia A., B.S. (1985)  
*Clinical Instructor in Obstetrics and Gynecology*
- Sheridan, Patricia E., M.S. (1985)  
*Adjunct Instructor in Communication Science and  
Disorders*
- Shiman, David A., Ph.D. (1971)  
*Professor of Organizational, Counseling, and Foundational  
Studies*
- Shinozaki, Tamotsu, M.D. (1962)  
*Associate Professor of Anesthesiology*
- Shirland, Larry E., Ph.D. (1976)  
*Professor of Business Administration*
- Shoemaker, Douglas A., A.A. (1985)  
*Instructor in Military Studies*
- Shreeve, Steven M., Ph.D. (1985)  
*Assistant Professor of Pharmacology*
- Shuman, Brian D., D.M.D. (1986)  
*Visiting Assistant Professor of English*
- Siegel, Andrew, M.D. (1974)  
*Clinical Associate Professor of Psychiatry*
- Siegle, John H., M.D. (1983)  
*Clinical Instructor in Anesthesiology*
- Sigler, Robert W., M.D. (1984)  
*Clinical Instructor in Medicine*
- Silver, George F., B.S. (1987)  
*Adjunct Lecturer in Agricultural and Resource Economics*
- Silverstein, Gerald C., Ph.D. (1985)  
*Visiting Assistant Professor of Microbiology*
- Simmons, G. Millard, Jr., M.D. (1986)  
*Professor of Obstetrics and Gynecology*
- Simon, Andrew L., M.A.T. (1984)  
*Lecturer in Romance Languages*
- Simone, Reno T., Jr., Ph.D. (1968)  
*Associate Professor of English*
- Sinkula, James M., Ph.D. (1983)  
*Assistant Professor of Business Administration*
- Sjogren, Robert E., Ph.D. (1967)  
*Associate Professor of Microbiology*
- Slinker, Bryan K., Ph.D. (1986)  
*Research Assistant Professor of Medicine and Physiology  
and Biophysics and Instructor in Medicine*
- Small, David F., M.D. (1978)  
*Assistant Professor of Anesthesiology*
- Smith, Albert M., Ph.D. (1957)  
*Professor of Animal Sciences*
- Smith, Amy H., M.S. (1979)  
*Associate Professor of Professional Nursing*
- Smith, Carol J., Ph.D. (1972)  
*Research Associate Professor of Pediatrics and Pathology*
- Smith, Cheryl A., Ph.D. (1983)  
*Assistant Professor of Communication Science and  
Disorders*
- Smith, Christopher S., M.D. (1982)  
*Clinical Instructor in Family Practice*
- Smith, Corinne M., M.S.W. (1983)  
*Lecturer in Family Practice*
- Smith, David Y., Ph.D. (1986)  
*Professor of Physics*
- Smith, Gary S., M.S. (1985)  
*Lecturer in Natural Resources*
- Smith, Kathleen A., M.S. (1987)  
*Adjunct Assistant Professor of Technical Nursing*
- Smith, Laura L., M.S.W. (1986)  
*Research Associate in Psychology*
- Smith, Paige N., Ph.D. (1985)  
*Adjunct Professor of Animal Sciences*
- Smith, Susan F., M.D. (1980)  
*Assistant Professor of Obstetrics and Gynecology*
- Smith, Yvette M., M.Ph. (1986)  
*Assistant Professor of Romance Languages*
- Smith-Williams, Pamela A., B.A. (1973)  
*Extension Associate Professor in Extension Service*
- Snider, Alfred C., Ph.D. (1982)  
*Associate Professor of Theatre*
- Snow, William C., M.E.E. (1969)  
*Extension Assistant Professor in Extension Service*
- Snyder, Thomas, M.D. (1983)  
*Clinical Assistant Professor of Neurology*
- Sofferman, Robert A., M.D. (1975)  
*Associate Professor of Otolaryngology*
- Solanch, Larry S., Ph.D. (1987)  
*Adjunct Assistant Professor of Psychology*
- Soll, Roger F., M.D. (1984)  
*Assistant Professor of Pediatrics*
- Solomon, Laura J., Ph.D. (1982)  
*Clinical Associate Professor of Psychology*
- Solomon, Paul R., Ph.D. (1987)  
*Adjunct Associate Professor of Pathology*
- Solomon, Samuel, Ph.D. (1968)  
*Visiting Professor of Obstetrics and Gynecology*
- Sommer, Robert G., M.D. (1981)  
*Clinical Assistant Professor of Medicine*
- Son, Mun S., Ph.D. (1984)  
*Assistant Professor of Statistics*

- Soreff, Stephen M., M.D. (1980)  
*Clinical Associate Professor of Psychiatry*
- Soule, M. Phyllis, M.A. (1966)  
*Assistant Professor of Nutritional Sciences*
- Southall, Rogers C., M.D. (1982)  
*Clinical Assistant Professor of Orthopaedics and Rehabilitation*
- Spartalian, Kevork, Ph.D. (1979)  
*Associate Professor of Physics*
- Spearing, Ann M., Ph.D. (1979)  
*Assistant Professor of Natural Resources*
- Sperry, John S., Ph.D. (1985)  
*Research Assistant Professor of Botany*
- Spillman, William B., Jr., Ph.D. (1987)  
*Adjunct Associate Professor of Electrical Engineering*
- Spinner, Thomas J., Jr., Ph.D. (1962)  
*Professor of History*
- Spratt, Daniel I., M.D. (1986)  
*Assistant Professor of Medicine*
- Sproul, Marga S., M.D. (1980)  
*Associate Professor of Family Practice*
- Sriram, Subramaniam, M.B., B.S. (1984)  
*Assistant Professor of Neurology*
- Stackpole, James W., M.D. (1962)  
*Clinical Professor of Pediatrics*
- Standage, Jeanette C., B.S. (1973)  
*Clinical Instructor in Medical Technology*
- Standen, Nicholas B., Ph.D. (1987)  
*Visiting Professor of Pharmacology*
- Stanfield, Robert E., Ph.D. (1969)  
*Professor of Sociology*
- Stanilonis, Paul B., M.D. (1969)  
*Clinical Associate Professor of Medicine and Family Practice*
- Stanley, Donald E., D.O. (1978)  
*Clinical Assistant Professor of Pathology*
- Stanley, Rolfe S., Ph.D. (1964)  
*Professor of Geology*
- Stanley, Susan M., B.S. (1987)  
*Extension Instructor in Extension Service*
- Stanton, Michael N., Ph.D. (1971)  
*Associate Professor of English*
- Stavrakakis, Ioanis, Ph.D. (1988)  
*Assistant Professor of Electrical Engineering*
- Stavrakis, Peter J., Ph.D. (1986)  
*Assistant Professor of Political Science*
- Steen, M. Dale, B.S. (1984)  
*Extension Instructor in Extension Service*
- Steffens, Henry J., Ph.D. (1969)  
*Professor of History*
- Stephany, William A., Ph.D. (1968)  
*Associate Professor of English*
- Stern, Peter, M.D. (1987)  
*Assistant Professor of Anesthesiology*
- Stevens, Dean F., Ph.D. (1967)  
*Associate Professor of Zoology*
- Stevenson, Samuel C., Ph.D. (1980)  
*Associate Professor of Professional Education and Curriculum Development*
- Stewart, James A., M.D. (1981)  
*Associate Professor of Medicine and Pharmacology*
- Stifler, David E., M.D. (1981)  
*Clinical Assistant Professor of Pediatrics*
- Stiles, Bonnie, M.S. (1987)  
*Adjunct Assistant Professor of Technical Nursing*
- Stirewalt, William S., Ph.D. (1979)  
*Research Associate Professor of Physiology and Biophysics*
- Stocks, Joseph F., M.D. (1981)  
*Clinical Associate Professor of Pathology*
- Stockwell, Sally A., M.D. (1987)  
*Clinical Assistant Professor of Obstetrics and Gynecology*
- Stokes, Ian A., Ph.D. (1980)  
*Research Associate Professor of Orthopaedics and Rehabilitation*
- Stoler, Mark A., Ph.D. (1970)  
*Professor of History*
- Stoltenberg, George K., Ph.D. (1982)  
*Adjunct Assistant Professor of Psychology*
- Stoltenberg, Wendy B., M.D. (1986)  
*Clinical Instructor in Psychiatry*
- Stouch, William H., M.D. (1967)  
*Clinical Associate Professor of Medicine*
- Stout, Neil R., Ph.D. (1964)  
*Professor of History*
- Strand, Edythe A., Ph.D. (1988)  
*Assistant Professor of Communication Science and Disorders*
- Strassler, David M., M.D. (1986)  
*Instructor in Family Practice*
- Strauss, Michael J., Ph.D. (1968)  
*Professor of Chemistry*
- Stryker, Barent W., III, M.S. (1969)  
*Extension Professor in Extension Service*
- Stump, David C., M.D. (1984)  
*Assistant Professor of Medicine and Biochemistry*
- Sturges, Robert A., M.D. (1981)  
*Clinical Instructor in Medicine*
- Sturtevant, Norman, M.D. (1984)  
*Assistant Professor of Radiology*
- Sugarman, Richard I., Ph.D. (1970)  
*Associate Professor of Religion*
- Sullivan, Anne M., M.S. (1971)  
*Associate Professor of Medical Technology*
- Sullivan, Cornelius J., D.M.D. (1987)  
*Clinical Instructor in Oral Surgery*
- Sullivan, Monica A., B.S. (1988)  
*Clinical Instructor in Medical Technology*
- Sussman, Betsey L., M.D. (1988)  
*Assistant Professor of Radiology*
- Swartz, Donald R., M.D. (1967)  
*Clinical Professor of Pediatrics*
- Sweeney, Paul W., M.D. (1981)  
*Clinical Assistant Professor of Medicine*
- Sweterlitsch, Richard C., Ph.D. (1974)  
*Assistant Professor of English*
- Swift, Peter D., M.D. (1984)  
*Assistant Professor of Radiology*
- Sylvia, Frederick P., B.S. (1986)  
*Lecturer in Business Administration*
- Sypher, Catherine V., M.A. (1984)  
*Lecturer in Theatre*
- Sze, Karl C., M.D. (1981)  
*Clinical Assistant Professor of Medicine*
- Tabakin, Burton S., M.D. (1963)  
*Professor of Medicine*
- Taber, David L., M.D. (1953)  
*Clinical Assistant Professor of Obstetrics and Gynecology*
- Taft, Jeffery W., M.Ed. (1986)  
*Assistant Professor of Military Studies*
- Talbot, Susan B., M.D. (1985)  
*Clinical Assistant Professor of Pediatrics*
- Talley, Carol A., M.D. (1988)  
*Assistant Professor of Orthopaedics and Rehabilitation*
- Tampas, John P., M.D. (1962)  
*Professor of Radiology*
- Tandan, Rup, M.R.C.P. (1985)  
*Assistant Professor of Neurology*
- Tandy, Carol J., B.S. (1972)  
*Clinical Instructor in Physical Therapy*
- Tanner, John S., M.D. (1970)  
*Clinical Instructor in Pediatrics*
- Tashman, Leonard J., Ph.D., (1978)  
*Associate Professor of Business Administration*
- Taxiarchis, Louis N., M.D. (1981)  
*Clinical Associate Professor of Pathology*
- Taylor, James M., M.D. (1984)  
*Clinical Instructor in Medicine*

- Taylor, Robert P., Ph.D. (1986)  
*Assistant Professor of Political Science*
- Tehrani-pour, Abolfazl, Ph.D. (1985)  
*Assistant Professor of Computer Science*
- Terrien, Christopher M., Jr., M.D. (1973)  
*Clinical Associate Professor of Medicine*
- Terrien, Timothy J., M.D. (1974)  
*Clinical Associate Professor of Medicine*
- Tesconi, Charles A., Jr., D.Ed. (1978)  
*Professor of Organizational, Counseling, and Foundational Studies*
- Tessman, Brenda V., M.S. (1987)  
*Lecturer in Microbiology*
- Thabault, Wilfred L., M.D. (1958)  
*Clinical Professor of Obstetrics and Gynecology*
- Thaler, Martin A., M.F.A. (1983)  
*Assistant Professor of Theatre*
- Thanassi, John W., Ph.D. (1967)  
*Professor of Biochemistry*
- Thanassi, Natalie M., Ph.D. (1980)  
*Research Associate Professor of Biochemistry*
- Thibault, Marlene P., M.A.T. (1979)  
*Extension Associate Professor in Extension Service*
- Thimm, Alfred L., Ph.D. (1981)  
*Professor of Business Administration*
- Thomas, Everett D., M.S. (1983)  
*Adjunct Professor of Animal Sciences*
- Thomas, Hilaire D., B.S. (1969)  
*Clinical Instructor in Medical Technology*
- Thomas, James M., M.D. (1983)  
*Professor of Surgery*
- Thomas, Peter A., Ph.D. (1978)  
*Research Associate Professor of Anthropology and Lecturer in Anthropology*
- Thompson, Harry L., Ph.D. (1971)  
*Associate Professor of Special Education, Social Work, and Social Services*
- Thompson, Lee, Ph.D. (1972)  
*Professor of English*
- Thompson, Philip P., Jr., M.D. (1981)  
*Clinical Associate Professor of Medicine*
- Thompson, Wayne L., M.S. (1986)  
*Assistant Professor of Radiology*
- Thomsen, Jeffrey W., B.A. (1987)  
*Lecturer in Human Development Studies*
- Thomson, Laurence E., Ph.D. (1977)  
*Adjunct Assistant Professor of Psychology*
- Thousand, Jacqueline S., M.Ed. (1981)  
*Visiting Assistant Professor of Special Education, Social Work, and Social Services*
- Thurber, Charles F., M.D. (1981)  
*Clinical Instructor in Medicine*
- Tierney, Denise E., (1981)  
*Clinical Assistant Professor of Radiologic Technology*
- Timothy, Robert P., M.D. (1982)  
*Clinical Assistant Professor of Urology*
- Tindle, Barbara H., M.D. (1977)  
*Associate Professor of Pathology*
- Tisdale, William A., M.D. (1965)  
*Professor of Medicine*
- Titcomb, Stephen, Ph.D. (1983)  
*Assistant Professor of Electrical Engineering*
- Tockman, Richard S., M.D. (1984)  
*Clinical Instructor in Family Practice*
- Toner, D. Thomas, B.Mus. (1984)  
*Lecturer in Music*
- Tonino, Richard P., M.D. (1983)  
*Assistant Professor of Medicine*
- Tooker, John, M.D. (1984)  
*Associate Professor of Medicine*
- Torbicki, Edward A., M.D. (1987)  
*Instructor in Anesthesiology*
- Tormey, David M., M.D. (1968)  
*Associate Professor of Family Practice*
- Toscano, Nicholas, Ph.D. (1985)  
*Assistant Professor of Romance Languages*
- Towne, Bradford M., D.M.D. (1984)  
*Clinical Instructor in Oral Surgery*
- Townsend, Robert L., M.S. (1974)  
*Extension Associate Professor in Extension Service*
- Tracy, Paula B., Ph.D. (1984)  
*Research Assistant Professor of Medicine and Biochemistry and Instructor in Medicine*
- Tracy, Russell P., Ph.D. (1984)  
*Research Assistant Professor of Pathology and Biochemistry*
- Train, David A., Ph.D. (1983)  
*Assistant Professor of Computer Science*
- Trainer, Thomas D., M.D. (1960)  
*Professor of Pathology*
- Trevino, Saul G., M.D. (1980)  
*Assistant Professor of Orthopaedics and Rehabilitation*
- Tritton, Thomas R., Ph.D. (1985)  
*Professor of Pharmacology*
- True, Marshall M., Ph.D. (1966)  
*Associate Professor of History*
- Trumper, John Y., M.D. (1970)  
*Clinical Instructor in Pediatrics*
- Truskolawski, Celeste, B.A. (1988)  
*Clinical Instructor in Medical Technology*
- Tufo, Henry M., M.D. (1970)  
*Professor of Medicine*
- Turner, Terry L., M.S. (1971)  
*Lecturer in Natural Resources*
- Tuxbury, Vernon W., Jr., M.E.Ed. (1966)  
*Extension Associate Professor in Extension Service*
- Tyler, Dona H., M.E.Ed. (1981)  
*Extension Instructor in Extension Service*
- Tyree, Melvin T., Ph.D. (1985)  
*Research Professor of Botany*
- Tyzbir, Robert S., Ph.D. (1973)  
*Associate Professor of Nutritional Sciences*
- Ullrich, Robert C., Ph.D. (1973)  
*Professor of Botany*
- Uphold, Ruth E., M.D. (1981)  
*Assistant Professor of Surgery*
- Valenti, August J., M.D. (1985)  
*Clinical Assistant Professor of Medicine*
- Valentine, John, M.D. (1982)  
*Clinical Assistant Professor of Medicine*
- Vander Meer, Canute, Ph.D. (1973)  
*Professor of Geography*
- Van Houton, Bennett, Ph.D. (1988)  
*Research Assistant Professor of Pathology*
- Van Houten, Judith, Ph.D. (1980)  
*Associate Professor of Zoology*
- Van Slyke, Gretchen J., Ph.D. (1983)  
*Assistant Professor of Romance Languages*
- Vecchio, James A., M.D. (1987)  
*Assistant Professor of Medicine*
- Veilleux, David L., M.A. (1980)  
*Lecturer in Professional Education and Curriculum Development*
- Venmar, Richard S., D.M.D. (1980)  
*Instructor in Dental Hygiene*
- Ventriss, Curtis L., Ph.D. (1986)  
*Associate Professor of Organization, Counseling, and Foundational Studies*
- Verlee, Thomas R., M.D. (1983)  
*Clinical Assistant Professor of Anesthesiology*
- Viani, Bruce A., M.D. (1987)  
*Assistant Professor of Anesthesiology*
- Villandry, Philip J., M.D. (1983)  
*Clinical Associate Professor of Anesthesiology*

- Vinson, Robert K., M.D. (1981)  
*Clinical Associate Professor of Surgery*
- Vissering, Jean E., M.L.A. (1982)  
*Lecturer in Natural Resources*
- Vogelmann, Hubert W., Ph.D. (1955)  
*Professor of Botany*
- Vogt, Brian T., M.S. (1988)  
*Extension Instructor in Extension Service*
- Vogt, Richard L., M.D. (1979)  
*Clinical Associate Professor of Family Practice and Medicine*
- Von Turkovich, Branimir, Ph.D. (1971)  
*Professor of Mechanical Engineering*
- Vorkapic, Peter, M.D. (1987)  
*Visiting Assistant Professor of Pharmacology*
- Voss, Carlyle B., M.D. (1980)  
*Clinical Associate Professor of Psychiatry*
- Vreeman, Anne-Louise, M.S. (1987)  
*Lecturer in Merchandising, Consumer Studies, and Design*
- Wackernagel, Frederick W.H., Ph.D. (1984)  
*Extension Assistant Professor of Agricultural and Resource Economics*
- Waddington, Margaret, M.D. (1981)  
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