

*The University  
of Vermont*

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**CATALOGUE  
1984-85**



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1984-85**



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*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.*

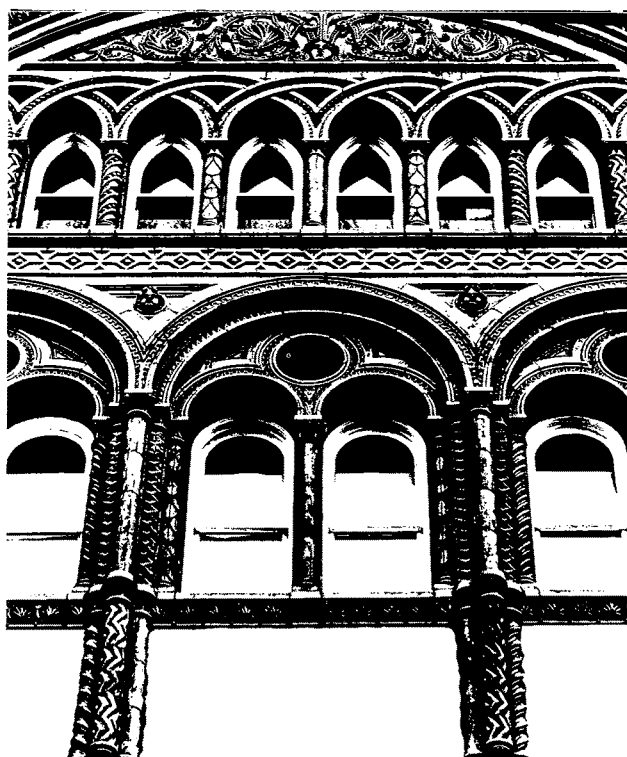


#### **POLICY STATEMENT ON NON-DISCRIMINATION**

*It is the policy of the University of Vermont to provide equal opportunity in admissions, programs, and activities in compliance with Title VI of the Civil Rights Act of 1964, Title IX of the Education Amendments of 1972, Section 504 of the Rehabilitation Act of 1973, and the Age Discrimination Act of 1975. As such, all University sponsored programs and activities, except where limitations or restrictions are legally permissible, shall be open to all students without regard to race, sex, handicap, color, religion, age, or national origin. In addition, it is the policy of the University that any and all forms of sexual harassment are unacceptable and will not be tolerated.*

*Inquiries regarding compliance with the foregoing, or the affirmative action policies of the University, should be directed to: The Assistant Vice President for Human Resource Development.*

*The University has an on-going program to provide accessible facilities and to respond to special needs of disabled persons. Questions should be referred to the Office of Architectural Barrier Control. In addition, students with physical or learning disabilities may contact the Office of Specialized Student Services in the Counseling and Testing Center.*





## Academic Calendar

### FALL 1984

Registration	August 27	Monday
Classes begin	August 28	Tuesday
Labor Day holiday	September 3	Monday
Fall recess	October 12	Friday
Preregistration	November 14-16	Wednesday-Friday
Thanksgiving recess	November 21-23	Wednesday-Friday
Classes end	December 10	Monday
Exams begin	December 13	Thursday
Exams end	December 18	Tuesday

### SPRING 1985

Registration	January 15	Tuesday
Classes begin	January 16	Wednesday
Martin Luther King holiday	January 21	Monday
Washington's Birthday holiday	February 18	Monday
Town Meeting recess	March 5	Tuesday
Spring recess	March 18-22	Monday-Friday
Preregistration	April 17-19	Wednesday-Friday
Honors Day	April 22	Monday (no classes after 3 p.m.)
Classes end	May 3	Friday
Exams begin	May 7	Tuesday
Exams end	May 11	Saturday
Commencement	May 18	Saturday

For informational purposes, the major Jewish holidays which occur during the academic year are listed below. Classes will meet as scheduled.

Rosh Hashanah (New Year)	September 27-28	Thursday-Friday
Yom Kippur (Atonement)	October 6	Saturday
Succot (Tabernacles, Beginning)	October 11-12	Thursday-Friday
Sh'mini Atzeret (Tabernacles, Concluding)	October 18	Thursday
Simchat Torah	October 19	Friday
Pesach (Passover)	April 6-7	Saturday-Sunday
Pesach, Concluding	April 12-13	Friday-Saturday



# 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 non-military 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 Royall 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 16 percent of the total operating budget of \$128 million. The largest single share (about 33 percent) is obtained from student tuition. Grants and contracts account for about 20 percent of the budget and the remainder comes from alumni and other private philanthropy, endowment, sales, services, and auxiliary enterprises.

During 1983-84, 7,724 students were enrolled in the eight undergraduate colleges and schools — the Colleges of Agriculture, 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 1,054 were enrolled in the Graduate College and 370 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 historical 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 55 programs leading to the Master's degree, and 16 programs leading to the degree of Doctor of Philosophy. 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.

#### VERMONT ETV

Vermont ETV is the public television network owned and operated by the University of Vermont, serving 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.

#### ENDOWED CHAIRS

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, honoring 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, 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.

The Pomeroy Professorship of Chemistry, 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, 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, established in 1895 by a bequest from Edwin Flint, A.B., 1836, lawyer and judge in Wisconsin and Iowa until his death in 1891 in Mason City, Iowa.

The Converse Professorship in Commerce and Economics, 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, 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.

The McCullough Professorship of Political Science, 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.

The Perkins Professorship of Zoology, 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, 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, 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.

The Corse Professorship of English Language and Literature, 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, 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, established in 1968 as a chair endowed by the alumni, honoring the Rev. Daniel Clarke Sanders, first president of the University.

The John L. Beckley Professorship in American Business, 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.

The Bishop Robert F. Joyce Distinguished University Professorship of Gerontology, 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.

## ACCREDITATIONS

The University of Vermont is accredited by the New England Association of Schools and Colleges. 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

Radiographic (X-Ray) Technology—American Medical Association (Committee on Allied Health Education Accreditation) upon recommendation of the Joint Review Committee on Education in Radiologic Technology

### ARTS AND SCIENCES

Speech-Language Pathology—American Speech-Language-Hearing Association

Music—National Association of Schools of Music

Clinical Psychology—American Psychological Association

### 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)—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





# Admission to the University

The 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 supportive information (interviews, achievement test scores, essays, activities). 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 academic program of his/her choice. All qualified Vermont freshman applicants will be offered admission. Non-resident 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 a foreign language, and two years of 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. Exceptionally well qualified students may in some instances be admitted even though they do not meet the above requirements in full. 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. For information about obtaining the G.E.D. certificate, please contact a local high school guidance office.

Additional courses in mathematics, history, science, the fine arts and music, and a third year in a foreign language 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 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

AREA	REQUIRED COURSES	RECOMMENDED COURSES
All Areas	4 years of English 3 years of mathematics (2 yrs. algebra, 1 yr. geometry) 3 years of social science 2 years of science 2 years of a foreign language	
Agriculture		1 year of biology 1 year of chemistry
Allied Health	1 year of physics (for physical therapy majors) 1 year of biology 1 year of chemistry	1 year of physics
Arts and Sciences		1 year of trigonometry (for science and math majors)
Business Administration	College preparatory curriculum 1 year of trigonometry	1 additional year of science
Education and Social Services		1 year of biology
Engineering and Mathematics	4 years of mathematics (including trigonometry) 1 year of physics (for engineering and computer science majors) 1 year of chemistry (for engineering majors)	1 year of physics 1 year of chemistry
Environmental Program		Additional mathematics and science courses
Home Economics Program		1 year of chemistry
Natural Resources		1 year of trigonometry (for forestry majors)
Nursing	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)

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, his/her relative qualifications, and the limitation which must be placed on the number of applicants who may be offered admission to the various academic programs which are 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 1984-85. Complete information may be obtained from the College Board, P.O. Box 592, Princeton, New Jersey 08540, or College Board, Box 1025, Berkeley, California 94701. Examination results from the American College Testing program may be substituted.

The College Board Achievement Tests in mathematics and the sciences are recommended 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 (AP) Examinations in *all* areas under the College Board. Credit is granted for grades of 3, 4, and 5 (a grade of 2 in Mathematics BC).

No college grade is assigned when AP credit is granted. Instead, credit is recorded on the student's permanent academic record for specific University courses. No fee, beyond that charged by the College Board, is assessed for such college credit. Appropriateness and applicability of the Advanced Placement Examination credit is determined by the dean/director of the college/school in which the student is subsequently a candidate for a degree.

## APPLICATIONS AND DEADLINES

The University of Vermont welcomes applications from all interested students regardless of race, religion, 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 non-refundable \$25 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, except for those applying to Physical Therapy or the four-year Professional Nursing program. These students have a February 1 completion date.

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 have to 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, of course, be made in case the student is not admitted.

The University of Vermont will give preference to all qualified transfer applicants who are Vermont residents. However, because of space limitations it is not always possible to grant admission to all qualified Vermont transfer applicants.

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

## EARLY NOTIFICATION PROGRAM

An early notification program is available for prospective fall freshmen who are Vermont residents (see residency rules, page 11). Vermonters applying under this program will be notified of their admission during mid-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 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 advanced tuition deposit at UVM.

## 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 is 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, candidates 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 has been prepared by the New England Board of Higher Education and is available through the Board, 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 1984-85 academic year:

### REGIONAL PROGRAMS

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

## INTERVIEWS AND VISITS

Students are encouraged to visit the campus to form their own first-hand impressions about the University. Prospective students may schedule an appointment with a current UVM student or a staff member on most weekdays during the academic year in order to gain information about the academic and non-academic 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 will be 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 STUDENTS/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 a pre-application form. Upon receipt of this completed form, the Admissions Office will send the student a formal 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. In addition to the required SAT (Scholastic Aptitude Test) or ACT (American College Testing) scores and other supporting documents, students whose native tongue 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 November 1 (for January admission) and February 1 (for September admission). At the present time, no financial aid is available from the University of Vermont to non-U.S. citizens. Therefore, students without adequate financial support from other sources should not submit a request for application forms. All international students attending UVM on non-immigrant student visas are charged out-of-state tuition rates.

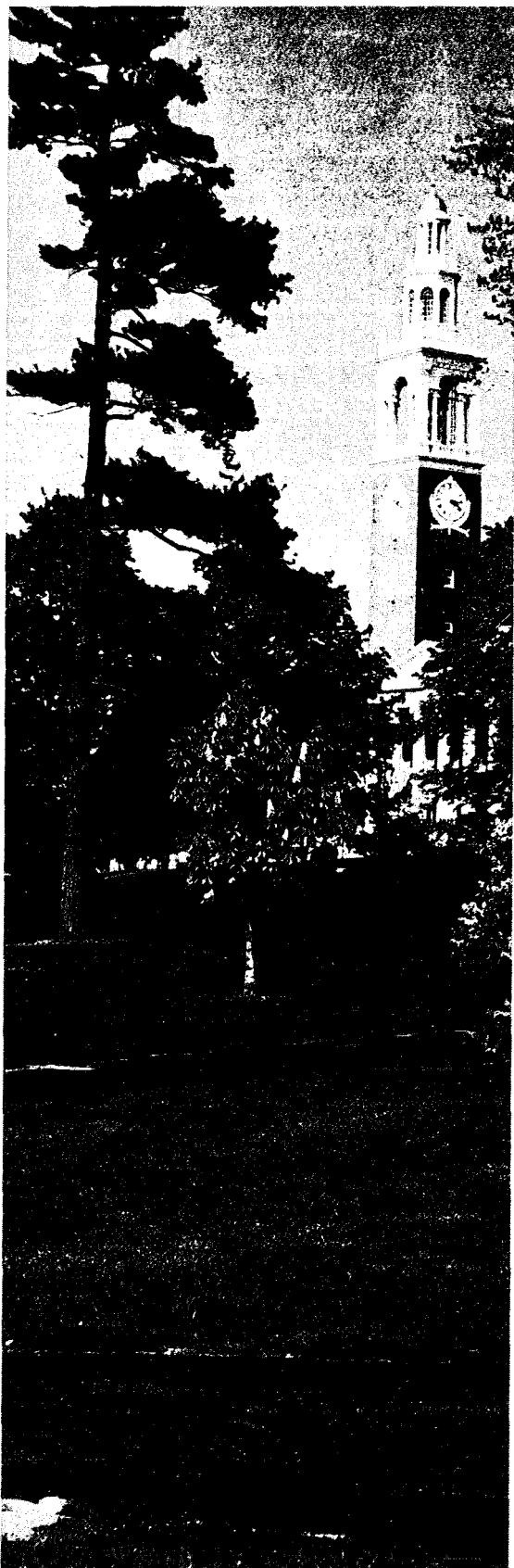
If a student is admitted to the University of Vermont, an I-20 form (Certificate of Eligibility for an F-1 visa) will be prepared by the Advisor in the Office of International Students. Before the I-20 form is mailed, the student will be required to show proof of adequate funding in the form of a bank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

**FOREIGN STUDENT SERVICES** An Advisor to International Students and Overseas Programs is available full-time to provide counseling and assistance to international students and faculty on personal and academic problems, and on matters relating to immigration and social and cultural adjustment. In a special orientation prior to the beginning of the fall semester, the Office of International Students provides new international students with an introduction to the University and Burlington community. An active campus International Club provides an opportunity for international students to contribute to campus life and to make American 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 post-secondary level are attempted. Students interested in transferring to the University may apply for admission to the fall or spring semester. Applications and supporting materials for mid-year admission should be filed by December 1. Applications for fall transfer should be complete by April 1, except for those students applying to the Physical Therapy or the four-year Professional Nursing program. These students have a February 1 completion date. Transfer candidates should see that official SAT scores and official transcripts of all their high school and college records are sent to the Admissions Office by the appropriate deadline. A transfer applicant may not disregard the record of any previous education received at another institution.



Transfer students are expected to have fulfilled the requirements for freshman applicants as mentioned above, as well as additional requirements necessary for the chosen major. A student who transfers to the University from another accredited college or university may be given provisional credit for all courses satisfactorily completed, provided that similar courses are counted toward graduation at the University of Vermont. Transfer credit is not allowed for work passed with grade "C-" or less unless a more advanced course in the same subject has been passed with a grade of "C" or higher at the institution from which the student transfers. Please note: Grades do not transfer. The quality point average of transfer students is computed on the work taken at the University of Vermont only. More information about credit transfer may be found in the General Information section of this catalogue.

Any credit is provisional, pending satisfactory completion of a semester's work at the University. The provisional transfer credits are fully granted if the student is in good standing at the end of the first semester.

The determination of how transferred courses listed on the Evaluation of Transfer Credit form fit a specific degree program rests with the academic dean/director of the college/school in which the transfer student subsequently becomes a candidate for a degree.

## 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 sub-degree level to take advantage of a course or combination of courses not available at the home institution. In order to participate in the program, state university students must:

1. Identify a course or combination of courses which is related to their area of academic interest and which is 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 Academic Affairs, 349 Waterman Building, University of Vermont.

## UNIVERSITY RESIDENCY REGULATIONS

The Vermont Legislature has established a lower rate of tuition for students who are Vermont residents. Such a policy has as its objective the attempt to more evenly distribute the cost of operating and supporting the University of Vermont between Vermont residents whose taxes have previously supported the University and non-residents who have not done so.

The Legislature has stated that enrollment at an institution for higher learning or presence within the state for purposes of attending an institution of higher learning shall not constitute residence for tuition purposes.

### IN-STATE STATUS REGULATIONS

(Adopted by the Board of Trustees, December 14, 1974; amended June 13, 1981)

The following requirements must be met by a student prior to being granted resident status for the purpose of admission, tuition, and other University charges:

1. The applicant shall be domiciled in Vermont, said domicile to be continuous for one year prior to the commencement of the semester next following the date of application. Changes in residency status shall become effective for the semester following the date of application. There shall be one date designated each year for the commencement of each semester and the summer term. A semester shall commence on the day classes begin for that semester. The summer term shall commence on the day classes begin for the summer term.
2. Domicile shall mean a person's true, fixed and permanent home, to which he/she intends to return when absent. A residence established for the purpose of attending an educational institution or qualifying for resident status for tuition purposes shall not of itself constitute domicile. Domicile shall not be determined by the applicant's marital status.
3. The applicant must demonstrate such attachment to the community as would be typical of a permanent resident of his/her age and education.
4. Receipt of financial support from the applicant's family will create a rebuttable presumption that the applicant's

domicile is with his/her family. A student who is the child of divorced parents, where the non-custodial parent or joint custodial parent has been domiciled in Vermont for 12 consecutive months immediately prior to application and such a parent has contributed in excess of 50 percent of said child's support during at least that period, may be granted In-State Status. Certified copies of such parents' IRS returns may be required.

5. An applicant becoming a student at an institution of higher learning in Vermont within one year of first moving to the state shall have created a rebuttable presumption of residence in Vermont for the purpose of attending an educational institution.
6. Eligibility to enroll as a resident student in another state shall create a rebuttable presumption against eligibility to be enrolled at the University of Vermont as a "Vermont Resident."
7. A student enrolling at the University of Vermont shall be classified by the Residency Officer (designated by the President), as a resident or a non-resident. The decision by the Residency Officer shall be based upon information furnished by the student and other relevant information. The Residency Officer is authorized to require such written documents, affidavits, verifications, or other evidence as he/she deems necessary.
8. The burden of proof in all cases rests upon the student claiming to be a Vermont resident and shall be met upon a showing of clear and convincing evidence.
9. The decision of the Residency Officer on the classification of a student as a resident or non-resident, may be appealed in writing to the Residency Appellate Officer, whose decision shall be final.

## ORIENTATION AND SPECIAL REQUIREMENTS

Following acceptance, students must submit by the appropriate deadline dates an acceptance fee and advanced tuition deposit, a statement of medical history, and a physical examination record. 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 September 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.



# Student Expenses and Financial Aid

The student expenses outlined in the following paragraphs are anticipated charges for the academic year 1984-85. 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 \$25 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 \$175 in order to reserve a place in the next enrolling class. Students admitted for the 1985-86 academic year will be required to pay \$225. 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. Of the total amount, \$50 is for initial advising, selection of courses, and personal orientation to the campus, a requirement for all incoming undergraduate degree students. The remaining \$125 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.

	Resident	Non-Resident
Tuition .....	\$2,550	\$6,760
Housing (Double Room) .....	1,898	1,898
Meals (Minimum Plan) .....	1,004	1,004
Inter-Residence Association Fee ..	10	10
Library and Athletic Bond Fees ..	82	82
Student Health Fee .....	114	114
Student Accident & Sickness Insurance (Optional) .....	108*	108*
Student Activities Fee .....	37	37
Books and Supplies .....	305*	305*
Total, excluding personal and miscellaneous costs .....	\$6,108	\$10,318

\*Estimated

## TUITION

*Vermont Residents:* \$107 per credit hour through 11.5 hours. From 12-18 credit hours—\$1,275 per semester plus \$107 per credit hour for each hour in excess of 18 hours.

*Non-Residents:* \$282 per credit hour through 11.5 hours. From 12-18 credit hours—\$3,380 per semester plus \$282 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 \$1,518 for triple occupancy, \$1,898 for double occupancy, and \$2,088 for a single room. Depending on vacancies, a limited number of large singles may be available at the rate of \$2,278 a year. For residents in the Hamilton Cooperative, the room charge is \$216 less than the cost of the room charge indicated above, depending on the type of occupancy.

The minimum University meal plan is \$1,004 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 and consumptive 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 SAGA Food Service Office, 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 7, 1984, 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 \$10 per year (\$5 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 \$34 per year (\$17 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 as required by the indenture covering the issuance of bonds and a portion is forwarded to the state government as required by Legislative Act.

### HEALTH FEE

The health fee of \$114 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 ACTIVITIES FEE

Undergraduate degree students enrolled in four or more credit hours are charged a fee of \$37 per year (\$18.50 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 \$305 is a low average. Some particular curricula may require one-time purchases which will change this amount.

Engineering students should add about \$100 for instruments and calculator.

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 \$165 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

\$4 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

#### 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 lessons are approximately one-half hour in length with 15 sessions being given each semester. \$132 per credit hour will be charged each student for such a course. 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 \$132 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	\$20
5	24
6	28
7	32
8	36
9 to 11.5	40

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 and not later than the day preceding the first day of classes unless otherwise announced. 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 \$175 payment (acceptance fee of \$50 and advance tuition payment of \$125) 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 three weeks of classes
- 40% refund during the 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/director receives such notification in writing. The dean/director may recommend to the registrar 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.

### 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 Family Financial Statement (FFS) directly to the American College Testing Program in Iowa City, Iowa (preferred), or the Financial Aid Form (FAF) to the College Scholarship Service in Princeton, New Jersey. 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 have complete applications on file by March 1. Applications received after that date will be processed in chronological order according to the date received, subject to the availability of funds.

Continuing upperclass students who wish to apply for aid may do so by submitting the Family Financial Statement (FFS) directly to the American College Testing Program in Iowa City, Iowa. FFS forms are available early in the spring semester from the Office of Financial Aid. Preference is given to those students who have complete applications on file by May 1. Applications received after that date will be processed in chronological order according to the date received, subject to the availability of funds.

ALL STUDENTS ARE REQUESTED TO APPLY to the Pell Grant Program (check appropriate section of the FFS or



FAF) 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**, comprised of tuition, required fees, room and board, books, supplies, and moderate personal expenses.
2. **EXPECTED PARENTAL SHARE** of educational cost as determined by the financial information provided by parents and/or students on the financial aid application form (FFS or FAF).
3. **STUDENT SELF-HELP**, usually from earnings, private loans, or savings.
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 in regard to maintaining satisfactory academic progress. Students who do not maintain satisfactory academic pro-

gress could lose their eligibility for financial aid.

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

#### 1984-85 IN-STATE AND OUT-OF-STATE EDUCATIONAL COSTS

Standard student budgets for the 1984-85 academic year are shown below. Actual costs for subsequent years may be higher if tuition, fees, and/or housing costs increase.

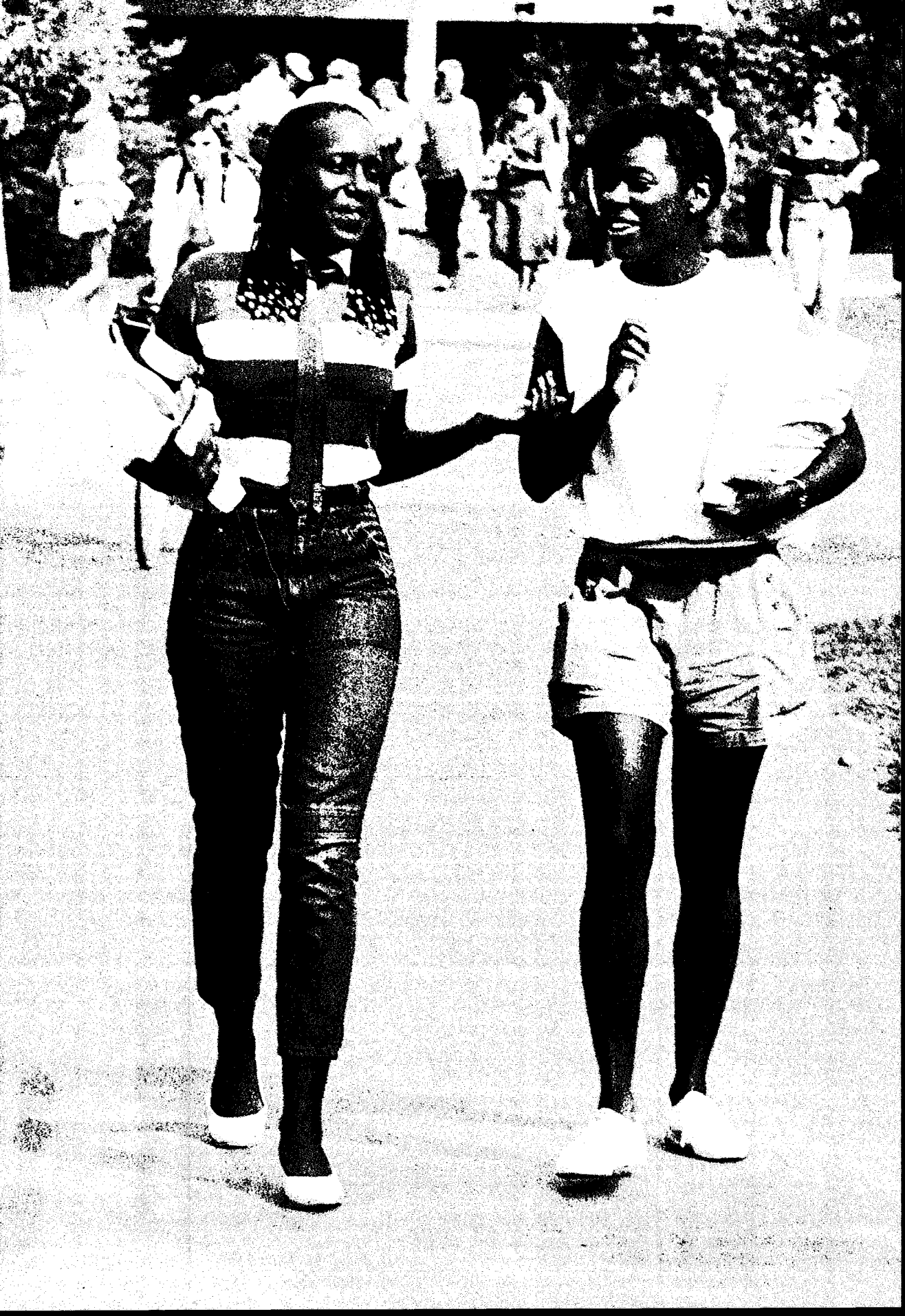
	SINGLE	
	In-State	Out-of-State
Tuition	\$2,550	\$6,760
Fees	243	243
Room	1,898	1,898
Board**	1,294	1,294
Personal	680	680
Books/Supplies	<u>305</u>	<u>305</u>
Totals	\$6,970	\$11,180

	MARRIED*	
	In-State	Out-of-State
Tuition	\$2,550	\$6,760
Fees	233	233
Room	5,760	5,760
Board**	2,592	2,592
Personal	1,687	1,687
Transportation	1,560	1,560
Books/Supplies	<u>305</u>	<u>305</u>
Totals (Rounded)	\$14,690	\$18,900

\*For dependent children, the budget is increased by \$1,200 for the first child, \$1,000 for the second child, and \$800 for each additional child.

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

The University of Vermont awards financial aid without consideration of sex, race, color, national origin, religion, age, or physical/mental handicap.



# Student Life

## SERVICES

Students go through a period of rapid personal growth while on the college campus. In addition to developing new academic skills, they are challenged to pursue new ideas, evaluate their values 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 to playing 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 improving 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 and on a limited basis to faculty and staff through the Employee Assistance Program. 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 OSS in planning for housing, classroom, and mobility needs. Please write for brochures describing the services at UVM for students with disabilities.

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).

## PROJECT STAY

STAY is a learning skills development center. Since its beginning in the fall of 1976, STAY has assisted hundreds of students in maximizing their academic potential, thus increasing their chances of retention. The staff at STAY provides developmental instruction in writing, reading, and study skills; supplemental tutoring; and academic, career, and personal counseling. The staff also helps students solve the various administrative problems they might experience such as locating possible sources of financial aid or understanding University accounting or course registration procedures.

Students are selected to participate in the program because of their financial need, their status as first generation college students, or because they are physically or learning disabled. A student must meet one of the above criteria in addition to having a personal and/or academic need in order to be eligible for STAY. Because the intention 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 as close to the beginning of the semester as possible. Applications may be obtained by calling (802) 656-4075 or stopping by 41 South Prospect Street.

### Campus-Wide Tutoring Program

As part of Project STAY, the campus-wide tutoring program allows all UVM students to obtain tutoring at reasonable rates. To receive the names and rates of potential tutors, students need only call or come by the STAY offices. Any student wishing to become a tutor may request an application at the same address.

## CENTER FOR CAREER DEVELOPMENT

The Center for Career Development provides all students with comprehensive assistance in exploring and implementing their career objectives. This function consists of two major efforts. The first is to provide direct assistance to students in clarifying career objectives based on their own skills, interests, needs, and abilities. The primary emphasis is through self-awareness, occupational awareness, skill development, and finally entry into the career areas which are complementary to their desired lifestyles. This process

is accomplished through one-to-one counseling and/or small group workshops. Along with providing career counseling, the office has developed an active Cooperative Education Program which enables students to fully integrate their academic and career goals. This program is integrated with the academic units in Agriculture, 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 career goals. The center's 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 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 being updated continuously.

After helping students to develop some tentative goals, the office can assist in their attempts to implement these goals. The office has a very active on-campus recruiting program which brings local and national employer representatives to campus for employment interviews. All part-time and summer employment opportunities are posted and made available to students attempting to offset a portion of their educational expenses or gain experience in a field of their interest. The staff will provide help in developing an effective resume, conducting employment interviews, developing a credential file, and assist in drafting an overall 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 at 322 South Prospect Street, (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, 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 for entry to medical, dental, optometry, podiatry, and osteopathy schools. General counseling, advising, and referral services are available to students with academic and non-academic questions and concerns.

The Preprofessional Advisor works in coordination with the Pre-Health Advisory Committee in preparing student letters of evaluation, as required by the majority of medical, dental, and health professional schools as part of the application process.

A system of Pre-Law Advising exists to assist students in their application to law school.

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

### **CENTER FOR SERVICE-LEARNING**

The Vermont Internship Program, offered through the Center for Service-Learning, is an opportunity for students to learn through direct experience in an organization or project related to academic, career, or personal goals. The program includes the year-long University Year for Action, semester-long Service-Learning Internships, and the 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 international settings. Internships should be pre-planned at least in the semester prior to participation. Center for Service-Learning staff provide assistance in locating internship sites and providing work plans, learning contracts, and financial planning. Information interviews are conducted to assist students in organizing a structured internship plan. Coordination and support services for the Vermont Internship Program are provided by the Center for Service-Learning.

The Center for Service-Learning also offers volunteer opportunities and assists the UVM Volunteers in Action Program, a Student Association sponsored organization that coordinates student-run volunteer projects such as Big Brother/Big Sister, Adopt-A-Grandparent, and tutoring programs. The CSL Resource Library contains information about community volunteer opportunities 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 non-academic 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 "Cultural Connection" organization funded by the Student Association involves students of the University in encouraging cultural pluralism and promoting cultural awareness on a campus-wide basis.

The Director of the Program is the official, non-academic advisor for participating students. Personal, social, academic, and other concerns are handled by Program staff.

The offices of the Minority Student Program are located in the Center for Cultural Pluralism.

### **Center for Cultural Pluralism**

The Center creates, 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 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 not only promotes cultural programs on campus but also 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. 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 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 center; and laboratory and radiology services. Most of these services are covered by the health fee (see page 14). 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 tertiary level 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, fluency disorders, voicing disorders, language disorders, articulation disorders, etc. The clinic also dispenses hearing aids and trains patients to use them efficiently.

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.

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 80 student organizations. They are a varied set, 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. Fifteen fraternities and six sororities, representing both national and local organizations, maintain active communities at UVM.

Extracurricular life focuses on Billings Student 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 various other student organizations are located in Billings Center.

### INTER-RESIDENCE ASSOCIATION (IRA)

The Inter-Residence Association is a government which 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 exist on the University of Vermont campus to recognize student contributions to the University community and student leadership in campus life.

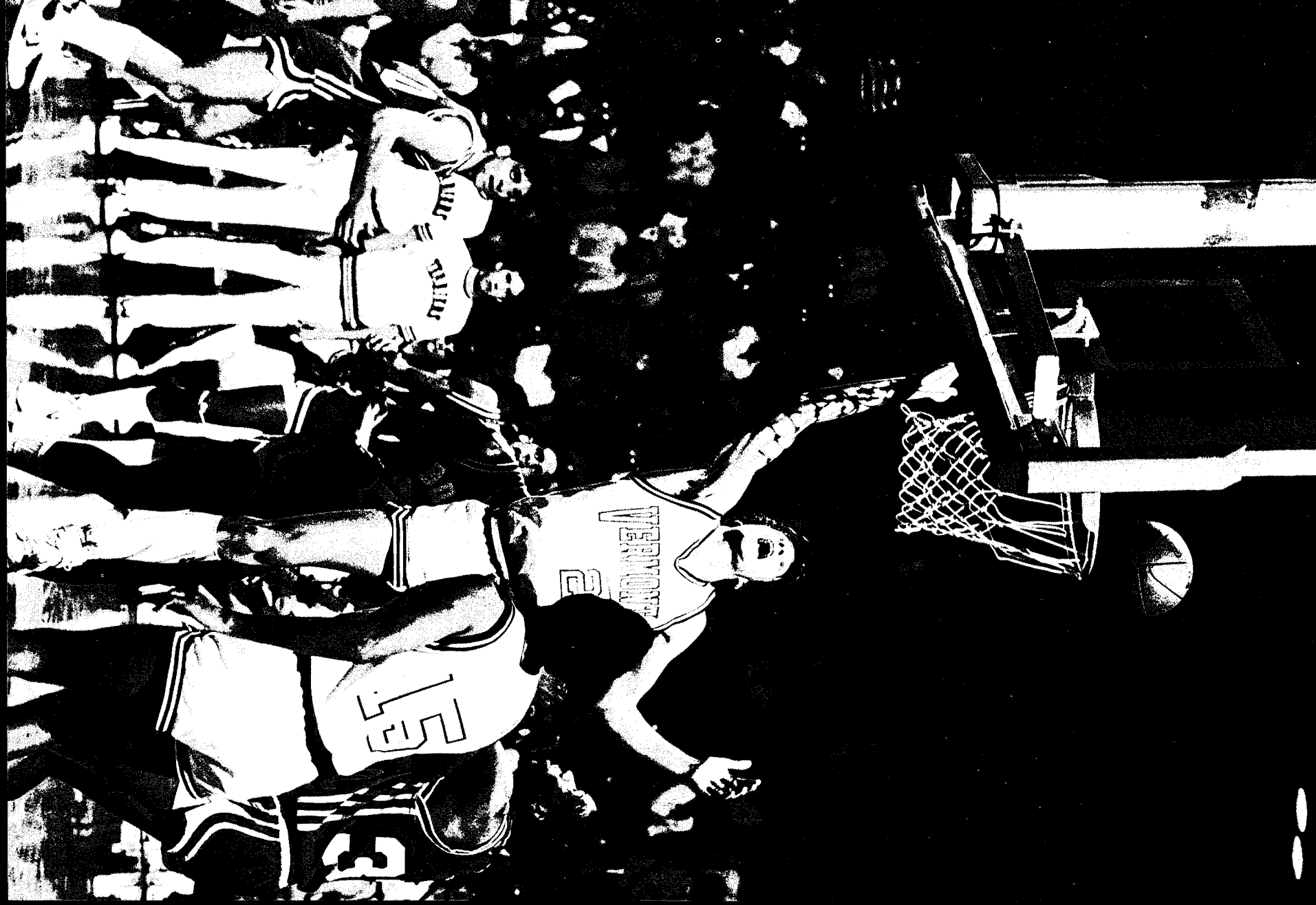
Local honorary societies include Boulder Society, which acknowledges outstanding senior men; and T.O.W.E.R.R., which acknowledges outstanding senior women.

National honorary societies represented on the University campus follow.

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 sound and honest scholarship, and for 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; Sigma Phi Alpha, dental hygiene; 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 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/combatative sports, and multipurpose building was completed in early 1982.

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 winter provides opportunities for hockey, basketball, skiing, swimming, gymnastics, and indoor track. The spring provides for baseball, lacrosse, and outdoor track. The programs offered to women include field hockey, tennis, soccer, cross-country running, and volleyball in the fall. Winter sports consist of swimming, gymnastics, basketball, skiing, and indoor track. The spring allows for lacrosse, softball, 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 are offered to provide the opportunity for a group of students to devote more time to one specific activity. 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, Vermont disc, fencing, wrestling, men's indoor soccer, cycling, and rugby.

Competitive sports are a desirable part of a student's program of education. The recreational sports department aims at fulfilling this responsibility by serving all students. A wide variety of 48 intramural activities is offered, and all full-time students 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.

## 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, 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 encompasses 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 and Choral Union are open by audition to students seeking participation in choral ensembles. The University Band, Stage Band, Vermont Winds, Brass Ensemble, Trombone Choir, Horn Ensemble, and University Orchestra provide performance opportunities for instrumentalists. All perform in various public presentations during the year along with some special performances which may include: The University Choral Union performing with the Vermont Symphony Orchestra and the Vermont Mozart Festival; The University Choir occasionally making a tour to area high schools; and the University Band performing at athletic events and mounting 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 along with special departmental concerts 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 North-

east. The Music Department serves as a showcase for the musical talents of the music majors and the faculty, as well as 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 685 concert and stage productions, over 100 film programs, and many events programmed especially for children. 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 at 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 Martha Graham Dance Company, 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, Isaac Stern, Marcel Marceau, Beverly Sills, Julian Bream, Rudolph Serkin, Lily Tomlin, and Itzhak Perlman. Theater has included such greats as Sir John Gielgud, Katherine Cornell, *Hello Dolly*, *Equus*, *A Chorus Line*, and a three-day visit of Britain's Theatre Royal Windsor.

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 the Green Mountain Consortium for the Performing Arts, the membership of which represents virtually all presenters of the performing arts in Vermont. And, in 1981, the Lane Series joined with the major arts presentors of New England to form New England Presentors, an organization devoted to cooperative arts planning in the region. 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 Memorial for the purpose of enlarging the Series' endowment.

### THE ROBERT HULL FLEMING MUSEUM

The Robert Hull Fleming Museum is Vermont's largest art museum and houses an outstanding collection of art and anthropological materials from the major cultural areas of the world. The permanent collections include paintings, sculpture, drawings, prints, photographs, costumes, textiles, and decorative arts. Strong holdings of American and European prints and drawings, North American Plains Indian, Pre-Columbian, South and Central American, and African materials, together with lesser holdings of Oceanic, Asian, Ancient, and Vermont materials, have been assem-

bled as a university teaching collection since 1826. The Museum also accommodates a full schedule of travelling exhibitions of contemporary art.

Approximately 5,000 school children and adults visit the Museum in groups annually and the Museum loans its educational kits to 100 schools. Each year more than 26,000 persons visit the Museum. The Museum has a membership of over 600. Receptions, lecture series, tours, trips, workshops, slide shows, and films augment the exhibitions programs.

### CHURCH STREET CENTER FOR COMMUNITY EDUCATION

The Center, located in the restored Ethan Allen Firehouse on Burlington's Church Street, offers over 100 non-credit mini-courses and workshops each 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, College of Agriculture, and the Academic Computing Center 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 AREAS AND INTERNATIONAL STUDIES

The Center for Areas and International Studies is an inter-departmental 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 Areas and International Studies administers the program of concentration in Area Studies and offers the B.A. degree in the College of Arts and Sciences.

### 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. Housing is guaranteed for all freshmen who meet appropriate deadlines. Housing is not guaranteed for upper-class students and is determined by a lottery held in the spring of each year. Upper-class 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 as a student 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, upper-class halls, coed halls, single sex halls, an environmental hall, and the Living and Learning Center (additional information on the Living and Learning Center is on page 40). Each residence hall is under the guidance and direction of a Hall Advisor who is assisted by specially selected undergraduate Resident Assistants who 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.

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 at the close of each semester. All students living in the residence halls must have board contracts.

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 multipurpose 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 fuel company.

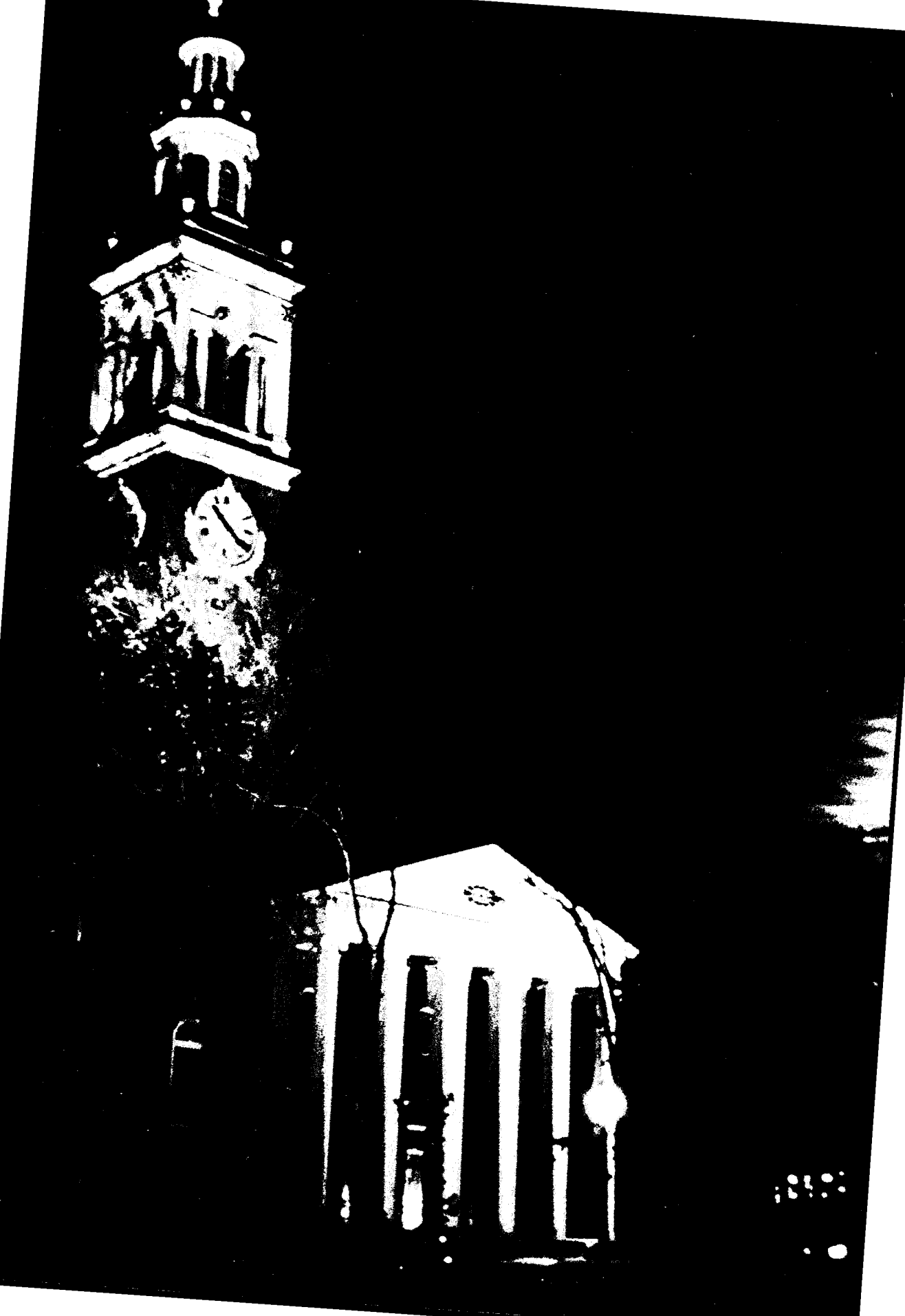
Detailed rental information may be obtained from the Ethan Allen Housing Office, 503 Dalton Drive, Fort Ethan Allen, Winooski, Vermont 05404, (802) 656-3228.

## 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 by 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/director 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/director 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/director 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 offices available to University undergraduates.

*The Academic Advising Center:* assists students who are undecided about their academic plans. The Center also helps students with complaints and grievances about course instructions, scheduling, and other academically-related problems.

*Pre-Health 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.

*Pre-Law Advising:* the UVM Pre-Law 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.

*Pre-Veterinary 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 three 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 third 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 third 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

The instructor sends one copy to the Registrar to be recorded on the permanent academic record. Students give a copy to their dean/director for information purposes. The instructor also records the withdrawal grade (WP or WF) on the final grade sheet which is sent to the Registrar.

- 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 "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/director.

- No withdrawals are permitted after the last day of classes.
- The grade of WP will not enter into the grade-point average. The grade of WF will enter the GPA as an F.
- The grade of "W" no longer is used so it is deleted from the set of available options.

## PASS/NO PASS

PASS/NO PASS course enrollments were approved by the University Senate for implementation in September 1968 to encourage 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 have 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 and they will 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 "D" 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:

- A PASS/NO PASS Request Form is obtained from the Registrar's Office and the academic advisor is consulted.
- 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 or director.

- 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:* Non-degree students may not take courses on pass/no pass basis.

## AUDITING COURSES

With the approval of the dean/director 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 and 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

- 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.
- 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.
- Prior to enrollment in independent study, students must obtain the approval of their advisor, faculty sponsor, and the faculty sponsor's department chairperson.
- 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.
- 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.
- 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.
- 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.

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/director.

## FINAL EXAMINATIONS

1. The examination period at the end of each semester is set by the official University calendar.
2. Semester examinations shall be given only during the regular examination period except by permission of the dean/director 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.
3. 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.
4. In every course in which a final examination is given, every student shall take the examination unless excused by the instructor.
5. 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.
6. 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.
7. If the absence is not reported as provided above, or is not excused by the instructor, the examination is regarded as failed.
8. No student shall be required to take three or more final examinations in one calendar day.
9. 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.
10. 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 ex-

## 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

Every student is expected to attend all regularly scheduled classes. This is a major responsibility of the student toward himself/herself and toward the University. The primary penalty for non-attendance lies in the student's 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.



aminations 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 academic vice president's office will establish which of the three examinations will be taken as a make-up.

11. 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.

A+	Excellent	4.00 points per semester hour
A	Excellent	4.00 points per semester hour
A-	Excellent	3.67 points per semester hour
B+	Good	3.33 points per semester hour
B	Good	3.00 points per semester hour
B-	Good	2.67 points per semester hour
C+	Fair	2.33 points per semester hour
C	Fair	2.00 points per semester hour
C-	Fair	1.67 points per semester hour
D+	Poor	1.33 points per semester hour
D	Poor	1.00 points per semester hour
D-	Poor	0.67 points per semester hour
F	Failure	0.00 points per semester hour

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.

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/director. 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/director'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/director'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/director'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/director's office.

2. **Personal tragedy.** Students contact the appropriate dean/director's office to discuss these matters. Confirmation of eligibility for incompletes will be provided to faculty by the dean/director.
3. **Academic.** Students contact the course instructor to request an incomplete grade. It is the instructor's responsibility to confirm to the dean/director eligibility for incompletes on academic grounds.

In all cases, the instructor will fill out and forward to the student's academic dean/director 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.
- 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/director by the end of the first month of the following semester unless an extension is granted by the student's dean/director.

## CLASS STANDING

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

Bachelor's degree:	Credit Hours
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

## HOUR TESTS

1. 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.
2. 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.
3. 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.
4. 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.

## TRANSCRIPTS

An official transcript is the reproduction of a complete, unabridged 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, 363 Waterman Building. The charge is \$2 for each transcript or \$5 for same-day service. 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 name, address, and telephone number of a student is such personal information and therefore will not release such address to persons requesting it if a student requests it not be released.

Often parents, friends, or fellow students call the University to find out the address or telephone number of such a student. Such information has in the past been generally available in the Student Directory. However, in the future the University will not release such information if requested. Students who do not wish to have name, address, and telephone number released should fill out a directory 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 indicated 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.

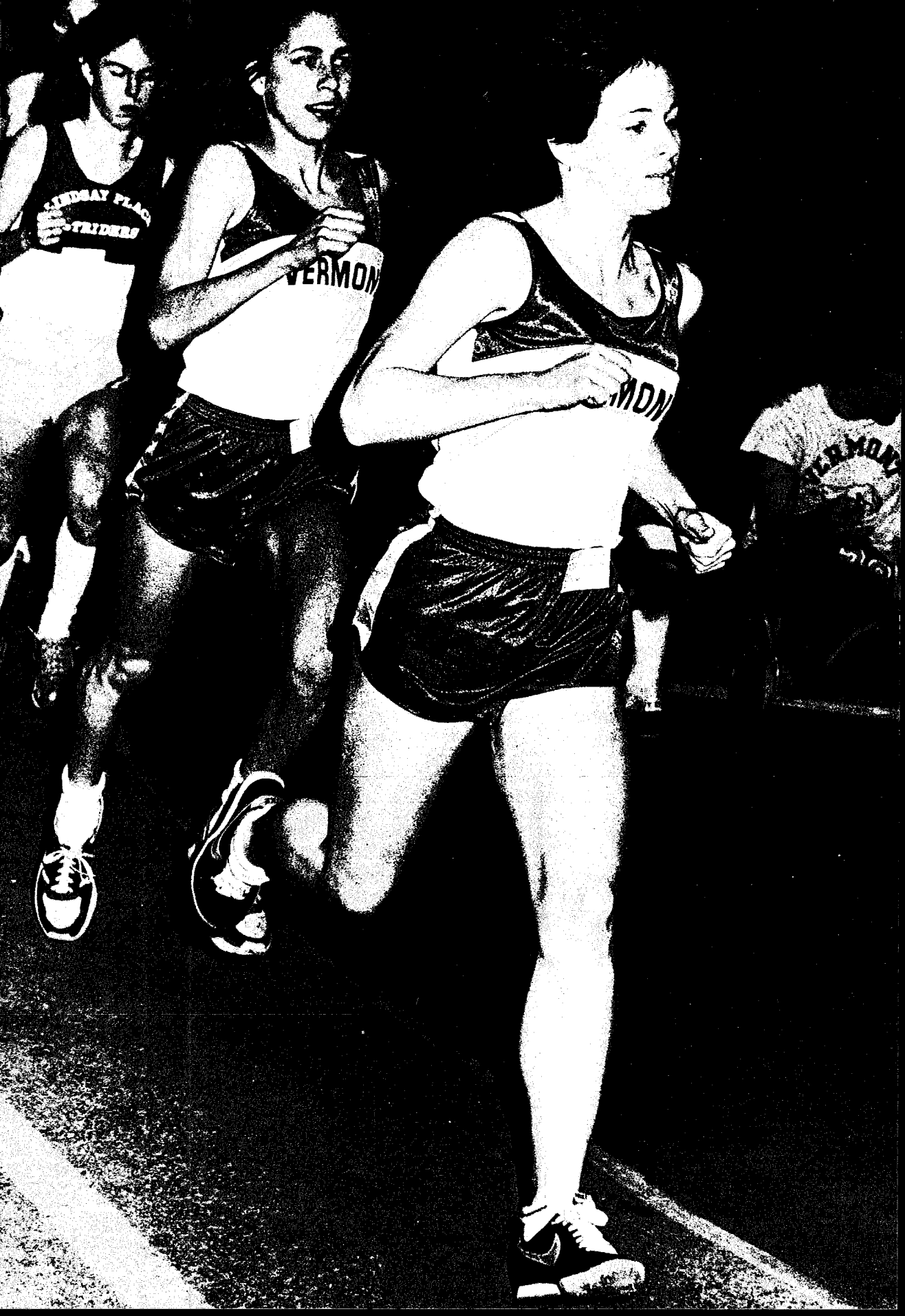
## DEAN'S LIST

The deans/directors of the undergraduate colleges/schools publish at the beginning of each semester the names of those full-time students 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/director a student may be granted a leave of absence by that dean/director 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/director of the college/school involved.



## WITHDRAWAL

Students who wish to withdraw from the University must first notify their academic dean/director 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/director'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/director.

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/director 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).
  - d. Students who have earned fewer than 30 semester hours of credit and are "on trial" are barred from participation in all athletic and other student activities.
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/director (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/directors of the two colleges/schools concerned. In the case of veterans receiving educational 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/director 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 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 except for medical care that is provided by the Student Health Center.

## 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. All students, as responsible citizens, 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/directors 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.

## 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 or director 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 \$25 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/director, 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 grants a *maximum* of six hours of credit for the following *minimal total* scores on the General Examinations: English Composition (600), Humanities (500), Mathematics (500), Natural Sciences (500), and Social Sciences-History (500). Each General Examination yields a total score reported on a scale that ranges from a low of 200 to a high of 800.

Each General Examination, with the *exception* of English Composition, has two subscores, reported on a scale ranging from a low of 20 to a high of 80, which describe achievement on the subdivisions of the test. Three semester hours of credit are granted for a subscore of 50 or higher.

The minimum *creditable* score on CLEP *Subject Examinations* is the average score of students who earned a grade of "B" in a comparable college course. These scores fall between 50 and 57 on a 20 - 80 range of scores. To learn the score required for credit in a specific examination, contact the Office of the Registrar, 360 Waterman Building.

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/director 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.

## CREDIT FOR MILITARY SERVICE

A veteran who has been accepted into a degree program may, upon presentation of DD Form 214 (Report of Transfer or Discharge), receive military studies credit for this experience in those divisions of the University in which credit for Reserve Officers' Training Corps courses is allowed. Exemption from the physical education requirement is given for service of more than one year.

The University accepts college level credit earned through the Defense Activity for Non-Traditional Education Support (DANTES) formerly the United States Armed Forces Institute (USAFI). DANTES maintains the educational record of the service men and women who have completed Subject Standardized Tests, CLEP examinations, and GED Tests.

The results of courses taken under the auspices of USAFI (disestablished in 1974) which carry academic credit and which were submitted prior to June 30, 1974, are available at no cost from: DANTES Contractor Representative (transcripts) 2318 South Park Street, Madison, Wisconsin 53713. Results of courses taken after July 1, 1974, are available at a nominal charge from: DANTES Contractor Representatives (CLEP) Educational Testing Service, P.O. Box 2819, Princeton, New Jersey 08540.

The Guide to the Evaluation of Educational Experience in the Armed Services is the standard reference work for recognizing learning acquired in military life by attending formal military courses. Evidence of satisfactory completion of formal military courses is needed for evaluation.

## TYPES OF ENROLLMENT

**DEGREE STUDENTS** — Students who have presented ap-

propriate credentials for admission and have been accepted as students in a degree program.

**NON-DEGREE 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 non-degree 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. Non-degree 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/director 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 non-degree students and should contact Continuing Education for information and registration material.

All non-degree 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

**E**nvironmental 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, 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 major 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 *Coordinate Major in Environmental Studies* combines study of the environment with a traditional disciplinary major or professional field. The *Major in Environmental Studies* provides a unique academic program for the student seeking an individually-designed interdisciplinary major, with opportunities for Honors Studies.

Students entering the University may apply for admission to Environmental Studies through several of the undergraduate colleges and professional schools. Choice of the appropriate college or school will depend on the individual's interests and educational objectives or, in the case of the Coordinate Major program, on the major or professional field to be coordinated with Environmental Studies. It is recommended that incoming students consult with the Environmental Program before making application to the University.

### COORDINATE MAJOR IN ENVIRONMENTAL STUDIES

For the majority of students, this program offers the best combination of career opportunities and environmental interests. In addition to the Environmental Studies Core Program, students complete the departmental requirements of a related disciplinary or professional major in their college or school *and* an individualized program of studies and independent work which strengthens the environmental aspects of the major.

#### Environmental Studies Core Program

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

#### Departmental Major Program

Consult other sections of the Catalogue for major requirements and actual credit hours.

#### Coordinate Option

At least three intermediate or advanced environmentally-related courses selected by the student in consultation with an advisor in the Environmental Program. These courses may be in the student's major field, a closely-allied discipline, or from several supporting fields.

Education students seeking certification in Environmental Studies in elementary or secondary education should refer to page 72.

Electives — and College or School Distribution Requirements

Total Credits

120+



**MAJOR IN ENVIRONMENTAL STUDIES** This interdisciplinary major offers students the opportunity to combine studies in several disciplines and professional fields. Each student's program is individually designed, rather than shaped around an existing departmental major, and provides the opportunity to direct study toward newly-developing environmental careers and graduate study programs. It is especially suited to the student seeking a broad liberal education with an environmental thrust.

This individually-designed major is a highly-selective program for qualified students with well-conceived academic goals. Admission to the major requires submission of a petition to the Environmental Program, approval of the Director of the Environmental Program, and successful completion of Environmental Studies 51. In addition to course requirements, the major includes a required senior research thesis, internship, or practicum.

#### Environmental Studies Core Program

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

#### Major Program

Major Seminar, ENVS 51	3
Individually-designed Program (Planning and selection of courses accomplished as a course project in Environmental Studies 51, including at least 24 hours of intermediate or advanced environmentally-related courses)	24 +
Research Seminar, ENVS 201	3
Senior Project and Thesis, ENVS 202/203	6-15 +
Senior Thesis (a research or action project, or internship) planned and designed in Environmental Studies 201. Actual credit arranged in consultation with senior thesis advisor.	
Electives — and College or School Distribution Requirements	60 +
Total Credits	120 + *

\*Consult appropriate college or school for exact credit requirements.

## The Home Economics Program

The Home Economics Program is an interdisciplinary program about people. It provides undergraduates with an opportunity to combine quality education and marketable career skills in a specific discipline with an opportunity to learn and to apply basic principles from many scientific disciplines to the problems faced by people — individuals and families — in day-to-day living. Students and faculty in the Program promote family-oriented research, course work, and community service among the affiliated departments and the University. Career opportunities for home economics professionals are available in private industry, public service, or educational institutions whose interests would be enhanced by a person with a strong science base and a sensitivity to individuals and families.

The offices of the Coordinator of the Program are located in Terrill Hall.

## DEGREE PROGRAMS

Students who combine their major in the Department of Human Nutrition and Foods or the Department of Textiles,

Merchandising, and Consumer Studies, or the Department of Vocational Education and Technology (Home Economics Teacher Education) with their study through the Home Economics Program are awarded the Bachelor of Science degree through the College of Agriculture.

Students who combine their major in the Department of Human Development Studies with their study through the Home Economics Program are awarded the Bachelor of Science degree through the College of Education and Social Services.

Other combinations of University majors and study through the Home Economics Program are possible.

## DEGREE REQUIREMENTS

Specific degree requirements are available from the department head offering the particular major and from the Coordinator of the Program. In general, students take a series of courses providing them a broad base and common background in behavioral and social sciences, humanities, and the physical and biological sciences. They also enroll for courses in areas such as food, shelter, human relations, nutrition, clothing, and individual and family resource management. A significant portion of the student's time will be spent in courses in the major area of study chosen by the student.

## AREAS OF STUDY

Students electing course work through the Home Economics Program will enroll in a major area of study offered by one of the supporting departments. The major areas currently offered are:

Through Human Nutrition and Foods (see page 49 for details):

- Dietetics
- Food and Nutrition

Through Vocational Education and Technology (see page 51 for details):

- Home Economics Teacher Education

Through Textiles, Merchandising, and Consumer Studies (see page 50 for details):

- Consumer Studies
- Fashion Merchandising
- Related Arts

Through Human Development Studies (see page 75 for details):

- Early Childhood Development
- Human Development and Family Studies
- Human Development Education

Students interested in applying for course work through the Home Economics Program are invited to contact the Coordinator of the Program or the head of the department in which their major area of study is listed.

Students who have chosen a major area of study other than the ones listed above and wish to add course work through the Home Economics Program are also invited to contact the Coordinator of the Program.

## 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 other 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 a summer camp of six weeks' duration 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 summer camp, or attendance at an on-campus summer military studies program, between the sophomore and junior year; one course per term during the junior and senior year; and attendance at a six-week summer camp between the junior and senior year. (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 (regardless of academic year). (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 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. Students also receive travel allowances to and from summer camp, plus approximately \$825 while at camp.

**EXTRACURRICULAR ACTIVITIES** Champlain Sabres and the Ethan Allen Rifles offer membership to participating students. The Champlain Sabres is a military organization fostering a spirit of friendship and cooperation among university students. Ethan Allen Rifles is an honorary society for the promotion of military and academic excellence. Both are chartered by the Student Association and sponsored by the Department of Military Studies.

**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 (six years' active reserve) 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.

## 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 149, pilot candidates participate in a 13-hour Flight Instruction Program during their senior 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.

**SCHOLARSHIPS** Air Force ROTC College Scholarships provide 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. 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 Overseas Programs is both an advising and a resource center for students interested in a year, semester, or summer overseas study experience. A full-time study abroad advisor maintains extensive information about overseas programs and foreign institutions and helps 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 must contact the Office of Overseas Programs and 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.

Program offices are located in B161, Living/Learning Center.

In addition to the opportunities for students to participate in hundreds of non-UVM overseas study programs all over the world, the University has direct involvement in the following programs:

The Vermont Overseas Study Program (VOSP) is a pro-

gram 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 Susan Quinn, Program Coordinator, Department of Romance Languages, 513 Waterman Building.

**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.

**School of Biological Sciences, University of Bath, Bath, England:** Plant and Soil Science majors have the opportunity to participate in this exchange program and become involved in either a summer work experience or attend school during the academic year. For information, contact Prof. Bertie Boyce, Department of Plant and Soil Science.

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

**Institute of European Studies:** This non-profit organization sponsors programs in Madrid, Spain; Mexico City, Mexico; Vienna, Austria; Freiburg, Germany; Paris and Nantes, France; and London and Durham, England. Semester, year, and summer options are available. For information, contact the Office of Overseas Programs.

**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 to 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 Overseas Programs.

**Semester at Sea:** UVM is a member of the Institute for Shipboard Education which administers a unique global semester under the auspices of the University of Pittsburgh. A wide variety of courses is offered, and port calls range from Egypt to Hong Kong. For information, contact the Office of Overseas Programs.

**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.

**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 Overseas Programs.

## The Living/Learning Center

**T**he 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 both an academic support unit and a residence, housing 588 students and eight faculty families, as well as faculty and administrative offices.

The Center is organized into programs, which are year-long plans of course work, seminars, and/or special activities related to academic or avocational interests created and directed by either students or faculty members. Living/Learning Center programs supplement the University's commitment to excellence in curriculum and instruction. The Living/Learning Center contributes to an environment in which all of the colleges and schools of the University are able to teach essential curricular elements in a unique atmosphere which fosters broad opportunities for intellectual discourse. All of the programs have a specific theme and plan, outlining what skills, knowledge, creative talents, judgment, and abilities the program member seeks to develop.

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 eight resident faculty and their families. The Center has a reading room/reference library, computer terminal room, grocery store, music practice rooms, dining hall, a preschool, an audio/visual room, U.S. post office, administrative and faculty office space, 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 "co-op" members of the pottery and photography studios, providing 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 involvement might include a sign language workshop, conversational Russian, dialogue with UVM faculty, artistic performances and gallery exhibits, and various other program events.

Attracting townspeople with 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, loyal 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 is an 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

**T**hrough evening, summer, and non-credit 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.

### 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/Director that any even-

ing 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 minicourses and workshops, career-oriented certificate programs, poetry readings, films, and exhibits. Community education programs are now available at a number of locations around the state.

## MANAGEMENT DEVELOPMENT SERIES

This seminar series offers management techniques and new technologies to provide professional development opportunities for individuals who work at all levels in both public and private organizations.

## CONFERENCES

Conference planning services through UVM's Continuing Education provide support for professional meetings, seminars, and conferences for 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 three offices: Grasse Mount, 411 Main Street, Burlington, (802) 656-2085; Church Street Center, 135 Church Street, Burlington, (802) 656-4221; Southern Vermont Continuing Education Center, 411 Western Avenue, West Brattleboro, (802) 257-7967.



# The College of Agriculture

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

The curricula of the instructional division prepare students for professional careers in 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 offices of the Dean of the College are located in Morrill Hall.

## ORGANIZATION

The College's resident instruction division consists of eight departments: Agricultural and Resource Economics; Animal Sciences; Botany; Human Nutrition and Foods; Microbiology and Biochemistry; Plant and Soil Science; Textiles, Merchandising, and Consumer Studies; and Vocational Education and Technology.

## DEGREE PROGRAMS

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

- Department of Agricultural and Resource Economics
  - Food Production Economics
  - Food Marketing and Agribusiness
  - International Agriculture

- Department of Animal Sciences
  - Animal Sciences
  - Animal Industry
  - Dairy Production
  - General
  - Livestock Production
  - Preprofessional/Science

- Dairy Technology
  - Processing and Quality Control
  - Dairy Production and Foods
  - General
  - Preprofessional/Science

- Department of Botany
  - Botany

- Department of Human Nutrition and Foods
  - Dietetics
  - Human Nutrition and Foods

- Department of Microbiology and Biochemistry
  - Biochemical Science

- Department of Plant and Soil Science
  - Plant and Soil Science

- Department of Textiles, Merchandising, and Consumer Studies
  - Consumer Studies
  - Fashion Merchandising
  - Related Art

- Department of Vocational Education and Technology
  - Occupational and Extension Education
  - Agricultural and Natural Resource Education
  - Extension Education
  - Health Occupations Education
  - Home Economics Education
  - Industrial Education
  - Agricultural Technology

- Inter-Departmental Programs
  - Biological Sciences
  - General Studies

## DEGREE REQUIREMENTS

All programs in the College of Agriculture 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. The successful completion of at least two courses in each of the following areas:
  1. Writing, communication, and public address
  2. Science, mathematics, and statistics
  3. Fine arts, philosophy, language, and literature
  4. Social sciences
- D. College of Agriculture Freshmen Orientation Course.
- E. Courses as specified in individual programs.

The applicability of courses to specific areas rests with the student's advisor and, if necessary, concurrence of the Dean of the College. It is recommended that courses chosen to fulfill these requirements be taken outside the department in which the student's program of study is located. 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 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 undergraduate research by recognizing excellent work by student scientists. Basically, students in cooperation with a faculty member initiate, plan, and conduct research and prepare a manuscript (or other appropriate report) on their work which is judged by the Honors Committee. Research projects may result from an undergraduate research elective, a special topics course, or as a part of an advanced undergraduate course. No specific grade-point average is required and research may be done within or outside the College.

Completed research, in a form appropriate to the research area, will be evaluated by the Honors Committee. Those of high quality will be chosen for College Honors. Students are recognized at College Honors Day and awards are added to the 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. Those interested in human medical sciences should enroll in biological sciences while individuals interested in veterinary medicine may enroll in either animal or biological sciences. Any student indicating a specific professional interest will be assigned a faculty advisor knowledgeable in that area.

Competition for admission to professional schools is very keen and a superior academic record throughout an under-

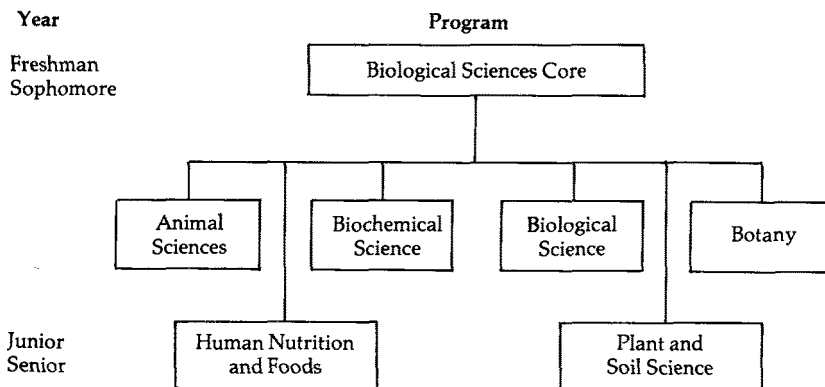
graduate program is necessary to receive consideration for admission. Due to this intense competition, all potential candidates are encouraged to also complete the requirements in an area of secondary interest.

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

## BIOLOGICAL SCIENCES CORE

Students initially interested in the broad area of biological sciences may enroll in this core curriculum for the freshman and sophomore years. The curriculum is designed to permit students to continue in basic biology or to transfer to one of the applied biology programs. In addition to the general college requirements listed above, students should complete during the first two years the following courses or their equivalents: Biology 1, 2 or Zoology 9 and Botany 4; Math. 19, 20 or Math. 21; Chemistry 3, 42 or Chemistry 1, 2 and 141, 142; Microbiology and Biochemistry 55 (Microbiology) and Animal Sciences/Human Nutrition and Foods 43 (Nutrition). Course descriptions are listed under the appropriate departments. Preprofessional students should consult their advisor to determine which courses are most appropriate.

Programs available upon completion of the core curriculum are listed below. Students may wish to select offerings from these programs during the freshman and sophomore years in addition to the required courses stated above.



## AREAS OF STUDY

### 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 Resource Economics in the School of Natural Resources.

**AGRICULTURAL ECONOMICS** Options in the agricultural economics program provide students with basic work in 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 the problems of U.S. or world agriculture. Students elect one of four options:

**Food Production Economics:** Prepares the student to manage a farm business or to work in the many service or educational fields related to agricultural production and finance.

**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 multi-disciplinary 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:

##### A. Communication Skills. For all options:

English 1	Written Expression
Speech 11	Effective Speaking

##### B. Quantitative Skills. For all options:

Math. 19	Fundamentals of Calculus I or equivalent
Statistics 111	Elements of Statistics, <i>or</i>
Statistics 141	Basic Statistical Methods
Computer Science 3	Computers and Their Application

##### C. Science. For Food Production Economics and Food Marketing and Agribusiness options:

A minimum of nine hours, comprised of one laboratory science course, one course in animal science, and one course in plant science.

For the International Agriculture option:

Chemistry 3, Outline of General Chemistry, plus one semester of another laboratory science.

##### D. Arts and Humanities. For all options:

Philosophy 13	Introduction to Logic
One unspecified course	

##### E. Social Science. For all options:

- One course in political science
- One course in another social science, excluding economics

#### II. Option Requirements:

##### A. Food Production Economics

###### Economics:

- 11, 12, Principles of Economics
- Agricultural and Resource Economics:
  - 2, World Food and Population
  - 161, Agricultural Finance
  - 166, Small Business Management, *or*
  - 151, Food and Lodging Business Management
  - 201, Farm Business Management
  - 207, Markets, Food, and Consumers
  - 208, Agricultural and Food Policy
  - 254, Production Economics

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

##### B. Food Marketing and Agribusiness

###### Economics:

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

###### Agricultural and Resource Economics:

- 161, Agricultural Finance
  - 166, Small Business Management, *or*
  - 151, Food and Lodging Business Management
  - 167, Small Business Marketing and Public Relations
  - 207, Markets, Food, and Consumers
  - 208, Agricultural and Food Policy
  - 210, Marketing Institutions
  - 264, Agricultural Price Analysis and Forecasting
- A minimum of an additional 15 hours from a list of restricted electives.

#### C. International Agriculture

###### Economics:

- 11, 12, Principles of Economics
  - 101, Macroeconomic Theory
  - 102, Microeconomic Theory, *or*
  - Agricultural and Resource Economics 54, Production Economics
  - 150, International Trade and Finance
  - 185, Comparative Economic Systems
- ###### Agricultural and Resource Economics:
- 2, World Food and Population
  - 161, Agricultural Finance
  - 166, Small Business Management, *or*
  - 151, Food and Lodging Business Management
  - 177, Alternatives for Vermont Agriculture
  - 201, Farm Business Management
  - 207, Markets, Food, and Consumers

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.).

#### D. The Rural Economy

###### Economics:

- 11, 12, Principles of Economics
- ###### 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
  - 196, Special Topics: The Vermont Economy
  - 196, Special Topics: Senior Seminar
  - 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 advisors 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 Vermont Experiment Station or to develop applied skills such as milking at the dairy farm. 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. 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:

**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.

**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.

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

**General Studies in Animal Sciences:** An opportunity to individualize a program or a place to start for students interested in Animal Sciences but who have no specific career goals at this time. Some students desire double majors in diverse areas (French/Animal Science; Psychology/Animal Science; Business/Animal Science) 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, Principles of Agricultural and Resource Economics, 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.

### Possible Dairy Production Option

Freshman Year	Hours
Agricultural Orientation	1
Intro. Animal Sciences	4
Biology	4-8
Inorganic Chemistry	4
Principles of Plant Science	3
Fundamentals of Nutrition	3
Principles of Agr. and Res. Econ.	3
Electives*	5-10

Sophomore Year	Hours
Animal Anatomy	4
Animal Feeding	4
Animal Health	3
Genetics	3
Intro. to Dairy Production	4
Organic Chemistry	4
Electives*	8-10

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 Repro. and Lactation	3
Dairy Herd Management	6
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.

### Possible Preprofessional Science Option

Freshman Year	Hours
Agricultural Orientation	1
Biology 1, 2	8
Inorganic Chemistry	8
English Writing	3
Introductory Animal Sciences	4
Fundamentals of Nutrition	3
Electives*	3-6

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

Junior Year	Hours
Animal Production	3-4
Biochemistry	4

Animal Physiology	4
Microbiology	4
Physics	8
Animal Health	3
English Writing	3
Electives*	2-5

Senior Year	Hours
Physiology of Repro. and Lactation	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.

**DAIRY FOODS** Vermont has the only Dairy Foods program in New England. 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.

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. Faculty members in the program help seniors to get job interviews.

A required core of 69 credit hours of courses that a student in any one of the four options must successfully pass is: Agricultural Orientation, Chemistry, Computer Science, Economics, English Composition, Fundamentals of Nutrition, Humanities/Arts, Introductory Animal Sciences, Mathematics, Physical Education, Public Speaking, Senior Seminar, Social Sciences, and all the Dairy Foods courses; i.e. Dairy Industry Managerial Training, Dairy Microbiology, Dairy Testing and Quality Control, Fermented Dairy Foods, Introduction to Dairy Foods, Processing Fresh and Frozen Foods, and Sensory Evaluation of Dairy Foods. In consultation with their advisor, students must select at least an additional 53 credit hours of courses in whatever option is chosen.

Faculty members in the program assist students to obtain summer employment. Examples of prospective employers in the Northeast are: Agri-Mark, Inc.; Bordens; 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 is written below.

#### Dairy Processing and Quality Management Option

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

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

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

Senior Year	Hours
Business	6
Dairy Industry Managerial Training	3
Economics	3
Electives*	14
Senior Seminar	1
Sensory Evaluation of Dairy Foods	3

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

#### BIOLOGICAL SCIENCE

This program is designed for students who want to major in the field of biology. It provides flexibility in developing a background in biological sciences. Students may fulfill their course requirements by selecting basic and applied courses from the several biologically-oriented departments (Animal Sciences, Botany, Human Nutrition and Foods, Microbiology and Biochemistry, Plant and Soil Science, Zoology, and others).

Graduates of the program may continue their education in graduate school or professional schools or they may obtain employment in a variety of areas. Possible job opportunities would include basic and applied research in educational institutions and governmental agencies, technical writing, employment with environmental consultants, and sales and merchandising positions requiring a scientific background.

The following courses are required of all students in the Biological Science program following completion of the Biological Sciences Core: genetics (one semester), biochemistry (one semester), physics (two-semester sequence), and statistics (one semester). In addition, all students must take five additional courses in basic or applied biology. These courses should be selected to include at least one course from the following areas: botany or applied plant science, zoology or applied animal science, evolution and diversity of life, ecology, and physiology or biochemistry. One or more of these courses should be at the 200 level and the others at the 100 level. These courses are selected in consultation with the advisor from the diverse offerings of the various colleges and departments.

#### BOTANY

Students in the Colleges of Agriculture or Arts and Sciences may major in Botany. Each undergraduate plans a program in consultation with a personal department 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, dentistry, 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; or Math. 19, 20 and Statistics, Physics 11, 12 or preferably 15, 16; 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. Botany 4 and Zoology 9 may be substituted for Biology 1,2.

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 participates in the interdisciplinary University Environmental Program as described on page 37. 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.

## GENERAL STUDIES

The General Studies Program allows students to build an academic program, incorporating their interests. Rather than specializing in one area, students are encouraged to participate in a broad range of subjects within the College of Agriculture.

Once students have identified the areas they want to bring together in this self-design, a program will be planned and developed with a faculty advisor.

The General Studies major will be required to complete 40 hours of courses offered by the College of Agriculture in areas such as human nutrition, consumer studies, animal sciences, botany, agricultural economics, or fashion merchandising. Twenty of the 40 hours must be 100-level courses or higher. All additional courses will be selected in consultation with the student's advisor.

## HUMAN NUTRITION AND FOODS

The Department of Human Nutrition and Foods 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,

economics, English composition, speech, statistics, and the humanities.

The course credits earned in Human Nutrition and Foods 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, 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 some choice of electives. Students may major in Dietetics (Plan IV with a general or clinical emphasis approved by the American Dietetic Association) or Human Nutrition and Foods with an option in food science or human nutrition.

**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. For ADA membership or to become a registered dietitian, the academic requirements and a clinical experience must be completed. This course plan 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.

**Human Nutrition and Foods:** This major is designed to provide a strong background in basic science, normal nutrition, and food with the opportunity to develop an option in food science or human nutrition. Graduates may find career opportunities with food companies, food management companies, community nutrition programs, government agencies and the Agricultural Extension Service, or graduate school.

**Home Economics Program:** This major is designed to provide students an opportunity to enroll in the Home Economics Interdisciplinary Program. Students may broaden their educational background by combining their area of specialization in Dietetics, Human Nutrition, or Food Science with courses in the Home Economics Program. This is particularly appropriate for nutrition professionals who plan to work with families in community-based settings.

## MICROBIOLOGY AND BIOCHEMISTRY

**BIOCHEMICAL SCIENCE** Contemporary biology increasingly demands knowledge of events at the molecular level. Students who plan a career of research or teaching in biology are well advised to concentrate on the principles and methods of biochemistry during their undergraduate years. To this end, the program in Biochemical Science provides a coordinated sequence of study in chemistry, biology, and biochemistry. Depending on the student's future plans and capability, three areas of concentration are possible: (1) **Cellular Biochemistry** emphasizes the physiological and metabolic reactions of organisms; (2) **Molecular Biology** focuses on the chemical and physical structures of subcellular particles; and (3) **Nutritional Biochemistry** emphasizes the synthesis and utilization of nutrients. Specialization in one of these concentrations normally commences in the junior year after completion of the Biological Sciences Core (page 44). Students are required to complete a minimum of three hours of physical chemistry (or eight hours for the Molecular Biology option), 12 hours of biochemistry and three advanced biology courses; two of which would be in their concentration (e.g. nutrition, physiology, genetics, microbiology, biotechnology, etc.).

PLANT AND SOIL SCIENCE

The Plant and Soil Science program has several specialized options designed for students interested in horticultural crops, agronomic crops, soils, and insect pest management 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.

**Agronomy:** This option is concerned with 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.

**Horticulture:** This option with 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.

**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.

**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.

**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), one semester of mathematics or statistics, 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.

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
Mathematics or Statistics	3-4
Chemistry 3	4
Chemistry 42 or 4	4
Six additional Plant and Soil Science courses at or above the 100 level	18-20
Two courses in Fine Arts and/or Humanities	6
Two courses in English and/or Communication	6
Two courses in Social Sciences	6

TEXTILES, MERCHANDISING, AND CONSUMER STUDIES

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 areas of concentration: 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.

Students may co-enroll in the Home Economics Program (see page 38 for complete description) with any of the three concentrations. This requires completion of professional concentration course requirements as well as home economics core requirements, and two seminars focusing on theoretical and practical implications of the home economics field.

All majors take the following courses: Design, Textiles: Fibers to Fabrics, Career Seminar, Introduction to Consumer Problems, Consumer Management Principles, Consumer Motivation, and Field Experience. This common base and a core of general University courses in the social, physical, and quantitative sciences, humanities, and communication enable students to investigate and evaluate their area of concentration. 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.

**Consumer Studies:** This concentration 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 or public service.

**Fashion Merchandising:** This concentration 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 retailing, buying, marketing, and promotion of consumer goods, particularly in the apparel or textiles areas.

**Related Art:** This concentration offers a choice of design emphasis: apparel, textile, or a combination. Students apply the elements and principles of design in weaving, dye-

ing, and printing fabric and/or 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, and apparel and textile production.

### VOCATIONAL EDUCATION AND TECHNOLOGY

The VOTEC department offers two major programs, (1) Occupational and Extension Education and (2) Agricultural Technology. These programs are flexible and provide seven areas of professional concentration. Certain concentrations may be completed either as (1) a major in this department, or (2) a dual major combined with another program at the University, and/or (3) without having to attend the University campus on a full-time basis. Courses of general interest are available to students majoring in other programs in the University.

**OCCUPATIONAL AND EXTENSION EDUCATION** Five areas of concentration prepare students for teaching certification. One concentration prepares students for adult education responsibilities in governmental agencies, private organizations, business, or industry. Prior to the beginning of their junior year, students desiring teacher certification must apply for admission to teacher education, and students desiring to complete the Extension Education concentration must declare their intent. 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's Program Approval Plan and have reciprocity certification in selected states. Selected 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) dual major specialist in the College of Agriculture or the School of Natural Resources.

#### Typical Curriculum

	1st SEMESTER	2nd
<b>FRESHMAN YEAR</b>		
Voc. Ed. and Tech. 52*	3	-
Animal Sci. 1 or Plant and Soil Sci. 11	3-4	-
English 1	3	-
Math. 9	3	-
Voc. Ed. & Tech. 6	-	2
Speech 11*	-	3
Ag. and Res. Econ. 61	-	3
Chemistry 3	-	4
Electives**	3	3
Phys. Ed.	-	1
	<hr/> 15-16	<hr/> 16

	1st SEMESTER	2nd
<b>SOPHOMORE YEAR</b>		
Voc. Ed. & Tec. 131, 132	3	-
Plant and Soil Sci. 11 or Animal Sci. 1	3-4	-
Psychology 1	3	-
Phys. Ed.	1	-
Voc. Ed. & Tech. 156*	-	2-3

Educ./Gen'l 2*	-	3
Educ./Lrng. Stds. 45 or 46*	-	3
Philosophy 1	-	3
Electives**	6	3
	<hr/> 16-17	<hr/> 14-15

### 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 Dual Major specialist in the College of Agriculture or the School of Natural Resources will complete the requirements for the primary major plus courses selected to meet specific state and national certification requirements.

\*\*Electives to meet College and program requirements, including specific state and national requirements for certification, to be selected with the approval of advisor.

**Home Economics Education:** Preparation to teach in the Consumer and Homemaking or Occupational Home Economics fields. Consumer and Homemaking field — preparation to teach Home Economics subjects commonly found in middle schools, junior high schools, and high schools. Occupational Home Economics field — preparation to teach specialized vocational subjects in grades 11-12. Acceptable experience in business, industry, or the military is required before the degree can be awarded in the Occupational field.

The Adult and Extension Education option provides an alternative for students not seeking teacher certification.

Students may enroll in the interdisciplinary Home Economics Program (see page 38).

#### Typical Curriculum

	1st SEMESTER	2nd
<b>FRESHMAN YEAR</b>		
Voc. Ed. & Tech. 52	3	-
Psychology 1	-	3
Sociology 10	3	-
English 1	3	-
Math. 9	-	3
Humanities Elective	-	3
Chemistry 3	4	-
Chemistry 4	-	4
Text. Mdsng.&Cons. Stds. 15	-	3
Human Nutr. & Fds. 37	3	-
Phys. Ed.	1	-
	<hr/> 17	<hr/> 16
	1st SEMESTER	2nd
<b>FRESHMAN YEAR</b>		
Economics 11 or Ag. and Res. Ec. 61	-	3
Speech 11	-	3
Humanities Elective	3	-
Science Elective	4	-
Human Nutr. & Fds. 43 or 46	3	-
Text. Mdsng.&Cons. Stds. 56	-	3
Text. Mdsng.&Cons. Stds. 20	-	3
Text. Mdsng.&Cons. Stds. 58	3	-
Text. Mdsng.&Cons. Stds. 51	-	3
Educ./Gen'l. 2	3	-
Phys. Ed.	1	-
	<hr/> 17	<hr/> 15

JUNIOR AND SENIOR YEARS

Voc. Ed. and Tech. 151, 152, 155, 270, 292  
Educ./Sec. 137, 138, Educ./Lrng. Stds. 45

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.

**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
FRESHMAN YEAR	SEMESTER	
Voc. Ed. & Tech. 20	3	-
Voc. Ed. & Tech. 52	3	-
English 1	3	-
Math. 9	3	-
Mech. Engineering 1	3	-
Phys. Ed.	1	-
Voc. Ed. & Tech. 6	-	2
Voc. Ed. & Tech. 30	-	3
Speech 11	-	3
Math. 2	-	3
Chemistry 3	-	4
Phys. Ed.	-	1
	16	16
SOPHOMORE YEAR	SEMESTER	
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
	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		
General Education		Hours
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
Professional Education		
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

**Technical Education**  
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 non-degree 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 non-degree 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 educational responsibilities in government agencies, private organizations, business, or 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.

**AGRICULTURAL 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 degree.

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

Typical Curriculum		
	1st	2nd
FRESHMAN YEAR	SEMESTER	
English 1	3	-
Math. 9 or 10	3	-
Mech. Engr. 1, Graphics	3	-
Voc. Ed. & Tech. 6, Energy	3	-
Phys. Ed.	1	1
Voc. Ed. & Tech. 197, Comp. Lab	-	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
SOPHOMORE YEAR	SEMESTER	
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.	3	-
Electives*	3	3
	<hr/>	<hr/>
	17	16

## JUNIOR AND SENIOR YEARS

Voc. Ed. and Tech. - 121, 123, 145, 162, 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.)





# 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 at all levels the spirit of reasoned inquiry and 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 with the skills necessary to cope with the complex human, societal, and technological problems of modern society. Finally, the College seeks to prepare students for direct 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 comprise the undergraduate curricula of the College. These curricula, through satisfaction of the major requirement, allow the student to attain baccalaureate level mastery of a specific discipline or an approved interdisciplinary program. As well, through satisfaction of the distribution requirement, students acquaint themselves with the diversity of approaches whereby people have come to understand themselves and their environment.

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

## ORGANIZATION

The College consists of 21 departments: Anthropology, Art, Chemistry, Classics, Communication Science and Disorders, Economics, English, Geography, Geology, German and Russian, History, Music, Philosophy, Physics, Political Science, Psychology, Religion, Romance Languages, Sociology, Theatre, and Zoology. Four additional majors are available through the College's Area and International Studies Program.

## DEGREES AWARDED

The Bachelor of Arts degree is awarded for the following majors:

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

The Bachelor of Science degree is also awarded for majors in Biology, Chemistry, Geology, Physics, and Zoology.

The Bachelor of Music degree is also awarded for majors in Music Performance and Music Theory.

## DEGREE REQUIREMENTS AND ACADEMIC REGULATIONS

Those students considering admission for Fall 1985 and thereafter should be aware that significant changes in the requirements for the Bachelor of Arts degree have been approved. Students entering prior to Fall 1985 will be responsible for the requirements presented below.

Candidates for the Bachelor of Arts and Bachelor of Science degrees awarded by the College of Arts and Sciences must present a total of 122 semester hours of credit, including two semester hours of credit in physical education. Of the minimum 122 credits, at least 96 must be taken in courses offered by the College of Arts and Sciences; and for the Bachelor of Arts, no more than 45 credits may be in the major discipline, while for the Bachelor of Science, no more than 50 may be in the major discipline.

Candidates for the Bachelor of Music in Performance must present a total of 125 credits including two semester hours of credit in physical education. Candidates for the Bachelor of Music in Theory must present a total of 123 credits including two semester hours of credit in physical education.

In order to receive a degree from the College of Arts and Sciences, students must have a minimum average of 2.00. Students must also complete 30 of the last 45 hours of credit in residence at the University of Vermont and as matriculated students in the College of Arts and Sciences.

Every candidate for a degree must complete the appropriate distribution requirements and a major program.

### DISTRIBUTION REQUIREMENTS

NO STUDENT MAY FULFILL THIS CATEGORY WITHOUT OFFERING A FOREIGN LANGUAGE AT THE LEVEL OF 10 OR HIGHER.

#### A. Language and Literature

English	Russian
Film	Spanish
French	General Literature
German	Classics 42
Greek	Classics 22
Hebrew	Linguistics 101, 102
Latin	

#### B. Fine Arts, Philosophy, and Religion

Art	Classics 42
Philosophy	Linguistics 101, 102
Religion	Speech
	Theatre

#### C. Social Sciences

Anthropology	Geography
Communication	History
Science and	Political Science
Disorders	Psychology
Economics	Sociology
	Linguistics

#### D. Sciences and Mathematics

Biology/Botany/	Geology
Zoology*	Mathematics/Statistics*
Chemistry	Physics

\*Count as one discipline for the purpose of distribution.

Only courses offered in the disciplines listed above may be used to satisfy distribution requirements. All courses must

be valued at three or more credit hours and may not be taken on a pass/no pass basis. Courses taken to fulfill distribution requirements may also be applied to the major. The specific requirements are as follows:

**BACHELOR OF ARTS:** Each student must present nine semester courses by choosing three courses from three of the categories A, B, C, and D above. In any given category, no more than two courses may be chosen from one discipline.

**BACHELOR OF SCIENCE:** Each student must present six semester courses selected from at least two of the categories A, B, and C above.

**BACHELOR OF MUSIC:** same as Bachelor of Arts.

### MAJOR REQUIREMENTS

All students in the College of Arts and Sciences must complete a major program. At least one-half of the major requirements must be taken at the University of Vermont, and only with the approval of the department chairperson will courses taken at another institution be applied toward completion of the major. All students must maintain an average in the major field of 2.0 or better and may not take courses required for the major or related field on a pass/no pass basis.

Of the minimum 122 credits, Bachelor of Arts candidates may take no more than 45 credits in the major department, and Bachelor of Science candidates may take no more than 50 in the major department.

Students may elect more than one major by consulting the Dean's Office and the departments involved. The student must complete the major requirements of each department, although courses taken to satisfy the related field requirement may overlap when deemed appropriate. All requirements for each major must be completed by the date of graduation in order to appear on the transcript.

**INDIVIDUAL DESIGN MAJOR** is a non-departmental major for those students in the College of Arts and Sciences whose needs and interests are not met by the major programs currently offered in the College. It is not the intention of the College that such a special major be a program of narrow professional training. Rather, the IDM must lead to an intensive investigation of some broad area of human knowledge which is not presently defined by a simple departmental discipline. Application must be made and approved before the beginning of the junior year. Students wishing to pursue this option should contact the Dean's Office for further information and an application form, and secure approval from the Committee on Honors and Individual Studies.

For specific major requirements, see the following pages.

### MINORS

Students may elect a minor. Students may complete more than one minor, but may not minor in the field of the major. At least one-half of the credits toward the minor must be completed at the University of Vermont. Courses taken at another institution will be applied toward completion of the minor only with approval of the department chairperson. All students must maintain an average in the minor field of 2.0 or better and may not take courses in the minor field on a pass/no pass basis. In cases of interdisciplinary minors, the minor must include at least 15 hours from disciplines outside the major. In cases of interdisciplinary majors, the minor must include 15 hours outside the courses constituting the major. The minor must be completed before the date of graduation in order to appear on the transcript.

### ELECTIVES

Students will select elective courses in consideration of the following limitations. Courses offered by other colleges or schools at the University may be taken by Arts and Sciences students, but only 24 hours of such credit may be applied to the minimum 122 required. Courses offered by other colleges or schools at the University by departments which offer majors in the College of Arts and Sciences are excepted from the 24-credit limitation. (At present, these include courses in Botany, Mathematics, the Environmental Program, and Statistics.)

**MILITARY STUDIES** courses may be taken by students in the College of Arts and Sciences, but only eight such credits may be applied to the minimum 122 required. Military Studies credits will be counted as outside of the College of Arts and Sciences. In general, the College does not grant credit for military service.

**PHYSICAL EDUCATION** courses, beyond the two required of all students, may be taken as elective degree credit, and will be counted as outside of the College of Arts and Sciences.

**READINGS AND RESEARCH** or independent study credits may be elected in any field including the major discipline. There is no limit on the number of Readings and Research credits which may be earned; but if a student elects nine or more such credits during any given term, the student must secure approval from the Committee on Honors and Individual Studies. Students will be required to adhere to the independent study guidelines, as described on page 28 of the current catalogue.

### TRANSFER

Students wishing to transfer to the College of Arts and Sciences from another college or school at the University must have a cumulative grade-point average of 2.50 or better and must have completed two semesters as a degree student at the University. Applications may be filed in the Dean's Office and will be acted upon at the end of each term. All students receiving a degree from the College of Arts and Sciences must earn 30 of the last 45 credits in the College; therefore, students wishing to transfer should make application by no later than the end of the junior year.

Transfer students from other institutions should note that 30 of the last 45 credits and one-half of the major credits must be earned at the University of Vermont and as a student in the College of Arts and Sciences. Transfer credit will be initially evaluated by the Registrar, although judgment as to the applicability of credit toward satisfaction of degree requirements rests with the Dean's Office and the chairperson of the major department. Transfer credit from other institutions is not used in the calculation of the University of Vermont grade-point average.

### SPECIAL PROVISIONS CONCERNING CREDIT

Credit will not be given for the following combinations:

- Biology 1, 2 and Biology 3
- Biology 1, 2 and Botany 4
- Chemistry 1, 2 and Chemistry 11, 12
- Chemistry 1, 2 and Chemistry 3,4
- Chemistry 141, 142 and Chemistry 140
- Mathematics 2 and Mathematics 10
- Mathematics 9 and Mathematics 10
- Mathematics 19 and Mathematics 21
- Mathematics 20 and Mathematics 21
- Music 1 and Music 11 or 12
- Music 3 and Music 31

Philosophy 1, 2, and 3  
 Physics 11, 12 and Physics 15, 16  
 Statistics 111 and Statistics 141  
 Zoology 5, 6 and Zoology 104  
 Zoology 9 and Zoology 5, 6 or Biology 1, 2  
 Zoology 104 and Anatomy 9 and/or Physiology 10

## ACADEMIC STANDARDS

The following criteria for academic trial and dismissal, while making allowances for the student in the freshman year, are designed to encourage academic work of quality equal to or greater than the minimum average required for graduation. Any student experiencing academic difficulty is encouraged to meet with a member of the Dean's Office.

**DISMISSAL:** Students who earn a semester average of 1.00 or less, or who fail (F, WF) half or more of their credit hours (excluding physical education and military studies), are dismissed for low scholarship. Students who are dismissed may not enroll in any University courses during the term of dismissal.

**TRIAL:** Students who earn a semester average higher than that which merits dismissal, but below 2.00 (1.67 for first-semester freshmen), are placed on trial. During the following term, students on trial must earn a 2.00, enroll in no courses on a pass/no pass basis, and maintain a program of 12 or more credit hours. Failure to satisfy any of the conditions of trial is grounds for dismissal.

It is the prerogative of the Committee on Academic Standing to modify the above regulations in light of extraordinary or extenuating circumstances.

## COMMITTEE ON ACADEMIC STANDING

The Committee on Academic Standing reviews all requests for special consideration with regard to College regulations, changes in enrollment, curriculum standards, and graduation requirements. Students may petition to this Committee through 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 so to direct their four-year undergraduate courses as 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 page 61.

**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: Professor Holland, Department of Political Science; Professor McGovern, Department of History; Professor Kuflik, Department of Philosophy; Professor Stanfield, Department of Sociology; Professor Halton, Department of Political Science; Professor Ashman, Department of Textiles, Merchandising, and Consumer Studies; Professor Severance, School of Business Administration; Larry Simmons, Center for Career Development; Susan Lackey, College of Arts and Sciences Dean's Office.

**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 9) 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. It is strongly urged that students desiring to enter medical college should during their sophomore year 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:

- (a) Math. 21, 22 (recommended for able students)
- (b) Math. 19, 20 (adequate)
- (c) 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*

- (a) Physics 15, 16 (recommended for students with calculus background)
- (b) Physics 24, 25 (recommended for students concentrating in the physical sciences or engineering)
- (c) Physics 11, 12 (acceptable for students without calculus background, or taking calculus concurrently)

Biology, one year minimum, *with laboratory*  
Biology 1, 2

Students who enter an accredited medical college after three years (90 hours) of undergraduate work may, on application and after completing one year of medical study, qualify as candidates for a Bachelor of Science degree.

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.

## MAJORS: DEPARTMENTAL REQUIREMENTS

For the Bachelor of Arts degree, the major field must include a minimum of 36 semester hours, at least 18 of which must be in the major discipline. Concentration requirements, including courses and necessary prerequisites may not exceed 60 semester hours. For the Bachelor of Science degree, the major field must include a minimum of 36 hours, at least 18 of which must be in the major discipline. No more than 94 semester hours of the total program, including distribution requirements and major field, may be in specifically designated courses.

**ANTHROPOLOGY** Thirty hours in Anthropology including 21, 24, 26, and 28 (these provide an introduction to the discipline's four major fields); 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). Minor programs are also available in these areas.

The approach to undergraduate education combines expo-

sure 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, 479 Main Street, 656-4062.

Specific requirements of the individual programs (with the exception of ASIAN) follow:

### Asian Studies

Currently available as a major field only for those students who can fulfill the language requirement in their special field. Asian language offerings are limited at the University of Vermont. It is anticipated that a minor in Asian Studies will be available in the near future.

#### East and Southeast Asia

Anthropology 163	South Pacific Cultures
Art 186	Monuments of Asia*
Art 187	Chinese Painting
Geography 58	China and Japan
History 31	Traditional Chinese Civilization
History 32	History of Japan
History 131	Modern China (1800-1949)
History 132	People's Republic of China (1949-present)
Philosophy 3	Comparative East-West Philosophy
Philosophy 121	Chinese Philosophy I
Philosophy 122	Chinese Philosophy II
Philosophy 221	Topics in Chinese Philosophy
Political Science 175	Asian Political Systems (China, Japan)
Political Science 176	Asian Political Systems (South and Southeast Asia)*
Religion 21	Intro. to Study of Religion: Asian Traditions*
Religion 132	Buddhist Tradition
Religion 141	Religion in Japan
Religion 145	Religion in China

#### South and West Asia

Anthropology 165	Peoples of South Asia
Anthropology 166	Peoples of the Middle East
Anthropology 170	Pastoral Nomads
Art 186	Monuments of Asia*
History 35	The Rise of Islam
History 36	Modern Middle East
History 105	History of the Ancient Near East
Political Science 178	The Israeli Political System
Religion 21	Intro. to Study of Religion: Asian Traditions*
Religion 114	Hebrew Scriptures

Religion 116	Judaism
Religion 131	Hindu Tradition
Religion 132	Buddhist Tradition
Religion 168	Contemporary Spiritual Life
Religion 196	Man and Nature in East and West

\* Courses that could be applied to either geographical minor

#### Canadian Studies

1. Eighteen hours representing at least four different disciplines selected from the courses of 100 percent Canadian content.

Area and Int'l Studies 91	Introduction to Canada
Area and Int'l Studies 197, 198	Readings and Research
Area and Int'l Studies 295, 296	Seminar
Anthropology 167	Peoples of Canada
English 135, 136	Canadian Literature
French 285, 286	French Canadian Literature
French 293	French Canadian Civilization
Geography 52	Canada
Geography 210	Special Topics in Regional Geography-Canada
Geology 52	Regional Geology (when this field course goes to Canada)
History 75, 76	Canadian History
History 175	Canadian-American Relations
History 176	Quebec: Province or Nation?
History 284	Seminar in Canadian History
History 285	Seminar in History of Quebec
Political Science 173	Canadian Political Systems
Sociology 167	Social Structure of Canada

2. French language through the intermediate level, French 51.

3. An additional two courses (six hours) from the above list and/or courses listed below.
  - (a) Those in which 25 percent or more content on Canada is a regular part of the course and assignments.

Anthropology 28	Language in Culture
Anthropology 168	The Franco-Americans
Anthropology 178	Sociolinguistics
Education (EDFS) 200	Multiculturalism in the U.S. and Canada: Myths and Realities
Environmental Studies 196/296	Environments of the Yukon and South Central Alaska (summer field course)
Geography 146	North American Resources (when taught by Meeks)

Geography 196	Geography of Northern Lands
Geology 211	Seminar in Sedimentary Processes: Clastics (when taught by Mehrrens)
Geology 273	Geology of the Appalachians
History 173	History of U.S. Foreign Relations (when taught by Stoler)
Political Science 71	Comparative Political Systems (when taught by Mahler)
Political Science 273	Comparative Political Analysis (when taught by Mahler)
Political Science 296	Comparative Legislatures (when taught by Mahler)
Sociology 129	Problems in Family and Kinship Analysis (when taught by Berkowitz)
Sociology 196	Special Topics - Medicine and Social Structure (when taught by Berkowitz)
Sociology 196	Special Topics - Power and Organization (when taught by Berkowitz)
(b) 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.	
Agr. and Res. Econ. 2	World Food and Population
Anthropology 160	North American Indians
Art 175	Nineteenth Century Architecture
Art 176	Twentieth Century Architecture
Economics 150	International Trade and Finance
Economics 185	Comparative Economics
Education (EDFS) 206	Comparative Education
English 13	Genre: Fiction
English 42	Women in Literature
Geography 62	Geography of Place Names
Geography 173	Industrial Location and Regional Development
Geography 174	Agricultural Geography
Geography 175	Urban Geography
Geography 177	Political Geography
Geography 270	Problems in Human Geography
History 126, 127	Intellectual History of the U.S.
History 174	History of U.S. Foreign Relations 1900-Present
History 181	Colonial America, 1607-1791
Linguistics 101	Introduction to Linguistics
Political Science 177	Political Geography
Political Science 235	Defense Politics Seminar



Political Science 250	Craft of Diplomacy
Political Science 252	American Foreign Policy
Political Science 256	International Organization
Sociology 204	Ecological Perspective on Human Communities
Sociology 207	Community Organization and Development
Sociology 254	Sociology of Health and Medicine
Sociology 255	Sociology of Mental Health

Two courses in Business Administration	6
Two approved electives at the 100 level or above	6
	38

\*A graduate certificate in Russian and East European Studies is offered in conjunction with a Master's degree program in a particular discipline.

#### European Studies (Northern, Western, Mediterranean)

1. 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.

2. 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.

3. 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, Special Topics) 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; and six hours of 100 level or above related critical, historical, social, or creative studies outside the department to be determined with the student's advisor.

**Art History:** Twenty-seven hours in Art History, including 5, 6; four courses at the 100 level, one in each of the following periods: Medieval (153, 154), Renaissance (158, 161, 164), Baroque (167, 168, 171), Modern/American (172, 175, 176, 179, 181, 184); 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 2, 3, 4, and three hours at the 100 level; nine hours of related historical and/or critical studies outside the department at the 100 level or above; 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 11, 12 with laboratory or preferably 15, 16; Math. 19, 20, or Math. 21, or Statistics 111 or 141 or 211. Thirty-six hours including

4. 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

1. 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 216; History 133, 134; or from courses recommended by the Program of Latin American Studies.

2. Plus six hours of advanced Spanish (Spanish 185, 186; 285, 286, 287; or 293).

3. An additional 12 hours from related courses chosen in consultation with advisor.

#### Russian/East European Studies\*

Required Courses:	Hours
Russian 12, 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
	43

2. 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.

1. 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



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 15, 16; Mathematics 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 undergraduate research or honors may be counted toward the total of the 46 required credits.

**BOTANY** Math. 21, 22; or Math. 21 and Statistics 111; or Math. 19, 20 and Statistics 111; Physics 11, 12 or preferably 15, 16; 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), 143, 144, 145, 146, 162, 163, 201, 202, and 231; Math. 21, 22, 121 (or equivalent); Physics 24, 25 (or 15, 16).

*Bachelor of Science:* Chemistry 11, 12, 13, 14 (or 1, 2, 121 or 1, 12, 14), 143, 144, 145, 146, 162, 163, 201, 202, 231, 232, 282; nine hours of advanced chemistry or biochemistry electives, which may include Chemistry 291; Physics 24, 25 (or 15, 16); 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:* Twenty-seven hours in courses numbered above 100 among which 111, 112 are required, one course in literature in translation numbered above 100 and one course in Greek above 100 are applicable; History 107, Roman History; a second foreign language (either six hours of Greek at least through 12 or six hours of a modern European language of which at least three hours are at the 100 level or above).

*Greek:* Twenty-seven hours in courses numbered above 10 among which 111, 112 are required, one course in literature in translation numbered above 100 and one course in Latin above 100 are applicable; History 106, Greek History; a second foreign language (either six hours of Latin at least through 12 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 at the level of 11 or above; 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:** 80, 90, 104, 251, 261, 262, 271; two from 101, 102, 103; Computer Science 11, Psychology 161, Statistics 111 or 141.

**ECONOMICS** Thirty-three hours in Economics including 11, 12, 100, 101, 102, three courses at the 100 level, and three courses at or above the 200 level. In addition, students must select nine hours from the other social sciences.

**ENGLISH** Twenty-seven hours to be distributed as follows: 81, 82, and at least 15 hours at the 100 level and at least six hours at the 200 level. Nine of these hours must be in courses in English literature before 1900, or in literary criticism, or in study of the language (101-129; 201-229). Satisfaction of the Language and Literature College requirement; 12 hours (six in courses numbered 100 or above) in a related field. No more than six credit hours of English 177, 178, Advanced Writing, will count toward fulfillment of major requirements.

**ENVIRONMENTAL STUDIES** Students may select either of two programs:

*Major:* Twenty-four hours of advanced courses approved by the Director of the Environmental Program, and Environmental Studies 1, 2, 51, 100, 201, 202, 204.

*Coordinate Major:* Nine hours of advanced courses approved by the Director of the Environmental Program; Environmental Studies 1, 2, 100, 204; and completion of a major in another department of the College.

Consult the appropriate section of this catalogue for requirements of major and coordinate major programs. See page 37.

**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. Twelve additional hours in a related discipline or an approved concentration.

**GEOLOGY** Students may select either of two degree programs:

*Bachelor of Arts:* Thirty hours of Geology, including 1, 101, 110, 131, and three hours 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\*, 260, either 231 or 232, plus nine additional hours of Geology, six of which must be at the 200 level.

**Ancillary Science Requirements:**

Chemistry 1 and 2 (or 11/13 and 12/14), Physics 15 and 16 (or 24 and 125), Math. 21 and 22 (or 19, 20, and 22), Computer Science 11, Statistics 141, plus six hours approved science, engineering, or math.

\*201 can also be taken as an independent field project or transfer credit from an accredited field program.

**GERMAN** Ten semester courses of advanced level including 101, 102; 281, 282; four semester courses of English or general literature; two semester courses of European history, an advanced related course to be selected in consultation with the department.

**HISTORY** Thirty hours in History including at least three courses at the advanced intermediate (100) level, and 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. Information as to which courses fall within which concentrations may be had from the department. 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. Other requirements: a foreign language pursued to the level of reading knowledge (usually a minimum of one semester at the university intermediate level or demonstration of competence by taking an examination), or a year's work in statistics and quantitative methods (usually Statistics 111 and History 121). Twelve hours of work in another discipline, or in Area Studies, of which six must be at the 100 level or above.

**MATHEMATICS** Thirty-six semester hours of courses numbered 21 or higher (including 102 or 104, and 124 and at least 15 semester hours in mathematics or statistics courses numbered 200 or above), plus Computer Science 11. Students interested in specializing in statistics 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, 211-213
- (c) Performance: 251-253, 255

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 col-

legiate music degree, designed for students who wish to pursue a career in music as performers, scholars, or private teachers. Such students must develop the skills, concepts, and sensitivity essential to the professional life of a musician. 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 should possess a high degree of talent, well-developed musicianship, artistic sensibilities, and a strong sense of commitment. Graduates will 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 evidence of a particular aptitude for, and potential in, musical theory, and will normally occur after the freshman year.

#### Performance Major

	1st	2nd
FRESHMAN YEAR	SEMESTER	
Major Instrument (151, 152)	2	3
Ensemble	1	1
Keyboard (5, 6)	1	1
Basic Musicianship (31, 32)	3	3
Non-Music Electives	6	9
Physical Education	1	-
	14	17

	1st	2nd
SOPHOMORE YEAR	SEMESTER	
Major Instrument (153, 154)	3	3
Ensemble	2	2
Keyboard (7, 8)	1	1
Intermediate Theory (131, 132)	3	3
Theory Lab (133, 134)	1	1
Music History (11, 12)	3	3
Non-Music Electives	3	3
Physical Education	1	-
	17	16

	1st	2nd
JUNIOR YEAR	SEMESTER	
Major Instrument (251, 252)	4	4
Ensemble	1	3
Advanced Theory (231, 232)	3	3
Arranging (233)	3	-
Music Genre Course	3	3
Non-Music Electives	3	3
	17	16

	1st	2nd
SENIOR YEAR	SEMESTER	
Major Instr. Recital (253, 255)	4	5
Ensemble	2	2
Conducting (259)	-	3

Music Elective	3	-
Non-Music Electives	6	3
	15	13

A minimum of 125 credit hours are required for graduation, including two hours of physical education.

### Theory Major

	1st SEMESTER	2nd SEMESTER
<b>FRESHMAN YEAR</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	-
Non-Music Electives	9	9
Physical Education	-	1
	16	16

	1st SEMESTER	2nd SEMESTER
<b>SOPHOMORE YEAR</b>		
Major Instrument (153, 154)	1	1
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	-
Non-Music Electives	6	3
Physical Education	-	1
	17	14

	1st SEMESTER	2nd SEMESTER
<b>JUNIOR YEAR</b>		
Major Instrument (251, 252)	2	2
Ensemble	1	1
Advanced Theory (231, 232)	3	3
Arranging (233)	3	-
Brass Class (81)	1	-
Percussion Class (89)	-	1
Conducting (259)	-	3
Music Genre Course	3	3
Non-Music Electives	3	3
	16	16

	1st SEMESTER	2nd SEMESTER
<b>SENIOR YEAR</b>		
Major Instrument (253, 254)	2	2
Composition (237, 238)	3	3
Orchestration (237)	-	3
Independent Study (241)	-	2
Music Genre Course	3	-
Seminar: Music Analysis (240)	-	3
Fugal Composition (235)	3	-
Non-Music Electives	3	-
	14	14

A minimum of 123 credit hours are required for graduation, including two hours of physical education.

**PHILOSOPHY** Twenty-seven hours including: (a) 13 or 113 or 213; (b) 101 and 102; (c) 201 or 202; (d) at least one of 4, 140, 142, 143, 144, 152, or 240; and (e) a total of at least three 200-level courses in Philosophy. An additional nine hours in a related discipline or disciplines is required.

Students considering graduate work are urged to study a foreign language.

**PHYSICS** Students may select either of two degree programs:

*Bachelor of Arts:* Twenty-five hours in Physics, including 15, 16, or 24, 125; 128, 201, or 202, 211 and 213; mathematics through 121. An additional laboratory science and a reading knowledge of French, German, or Russian are strongly recommended.

*Bachelor of Science:* Physics 24, 125 (or 15, 16), 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 including four of the "core courses" (21, 31, 51, 71, 81); 15 hours at the 100 level or above, including nine hours at the 200 level, and including at least one advanced course in three different sub-fields; a minimum of 12 hours must be completed in courses numbered 121-184 and 211-285, including six hours in courses numbered 211-285; nine hours in a related discipline, of which six must be in courses numbered 100 or above.

**PSYCHOLOGY** Requirements for the major in Psychology are 1, 109, 110, 119, and a minimum of 18 additional credit hours in Psychology, with a minimum of 12 credit hours at the 200 level or above. At least three credit hours must be taken from each of the categories A, B, and C as follows:

A. 205, 206, 210, 220, 221, 222, 223, 264

B. 230, 233, 234, 236, 237, 261, 262, 264, 266

C. 250, 251, 253

A minimum of nine credit hours in a related field or fields at the 100 level or above are also required. Courses to fulfill this requirement will be determined by consultation with the major advisor.

**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). *Note:* Courses in the 140-149 range will satisfy either the Asian traditions or the cultural requirement; an additional course at the 200 level.

\*Up to nine 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 36 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 36 required hours. History 158 will count, since it is taught in Spanish.)

**RUSSIAN** Nine semester courses at the advanced level to be chosen in consultation with a faculty member teaching in the Russian language curriculum, four semester courses to be chosen from English, general literature, or foreign

language, plus three 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. 209, 225, 232, 237
- B. 241, 249, 274, 275, 279

At least three credit hours must be taken from each of three of the following categories:

- C. 202, 204, 205, 206
- D. 214, 216, 217, 255, 258
- E. 211, 219, 229, 240, 242, 254
- F. 207, 228, 285, 286, 288, 289

And a minimum of six hours in the related fields of anthropology, communication, economics, geography, history, political science, or psychology.

**THEATRE** Thirty-three hours of Theatre courses, including 1, 5, 10, 15, 40, 115 or 140; 125 or 126; two courses selected from 127, 128, 129, and 130; 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; one semester of calculus; Physics 11, 12 with laboratory or preferably 15, 16. Thirty hours of biology and zoology including Biology 1, 2, 101, 102, 103, Zoology 104, plus seven hours chosen from 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 15, 16; 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 200-level biology and zoology courses. Three hours of undergraduate research or honors may be counted toward the total of the 43 required credits.

## MINORS

Minors must consist of 15 to 20 hours of work, including at least nine hours at the 100 level or above. Prerequisites for the minors must be from outside the minor department and must not exceed 12 hours.

## SPECIFIC MINOR REQUIREMENTS FOLLOW:

### 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 228, 225, 283, or 290.

*Archaeology:* 24; two from the following: 160, 161, History 105; 200 or the equivalent; 210.

### 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

1. Biology 1, 2 (or Zoology 9, Botany 4).
2. One of the following: Biology 101, 102, 103, Zoology 104, Botany 108.
3. 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

1. Chemistry 1, 2\*
2. One of the two following sequences:
  - a. Chemistry 141, 142+ and one of the following: 121+, 160, 162, 163
  - b. 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 12 or above, to which three hours from the following are applicable: 111, 112; History 107; Classics 153, 154, 155, 156.

*Greek Language and Literature:* Fifteen hours of Greek at 11 or above, to which three hours from the following are applicable: 111, 112; 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 9 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; 101; 103; 104.

### ECONOMICS

*Economics Theory and Method:* 11, 12; 100; 101; 102.

### ENGLISH

1. *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.
2. *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.
3. *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.

### GEOGRAPHY

*Human Geography:* A minimum of 15 hours including one course from 1, 3, or 16; one course from those numbered 51 to 74; and nine hours from 155, 170, 171, 173, 174, 175, 177, 179, 183, 201, 233, 261, 270, or 287.

*Physical Geography:* A minimum of 15 hours including 2 or 43; one regional course (51-61); and nine hours from 142, 143, 146, 201, 216, 242, 261, or 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 11, 12; three courses at the 100 or 200 level.

**HISTORY** Eighteen hours in History, nine of which must be 100-level or above, and 12 of which must come from one of the following areas of concentration:

- Ancient-Medieval-Renaissance-Reformation*: 1, 9, 15, 16, 31, 50, 105, 106, 107, 111, 112, 116, 150, 210, 211.
- Modern Europe (Renaissance to Present)*: 5, 6, 40, 50, 51, 52, 53, 54, 55, 56, 111, 112, 124, 125, 150, 151, 152, 153, 154, 155, 158, 250, 251, 278.
- United States/Western Hemisphere*: 7, 8, 70, 71, 72, 75, 76, 79, 80, 123, 126, 127, 170, 171, 172, 173, 174, 175, 176, 181, 182, 183, 184, 185, 186, 261, 270, 271, 280, 281, 282, 283, 284, 285.
- Third World/East Asia*: 2, 31, 32, 33, 35, 36, 37, 41, 131, 132, 133, 134, 137, 230, 231.
- History of Ideas/Methodologies*: 20, 21, 22, 25, 121, 122, 123, 124, 125, 126, 127, 128, 129, 220, 221.

**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, 2, 3, or 4; 101, 102, or 102, 112, or 101, 140. At least one course from 201, 202, 240, and six additional hours at the intermediate level of above. (Except with departmental permission, courses numbered 180-199 and 280-299 will not count toward fulfillment of the minor.)

**PHYSICS** Eighteen hours including 24, 125 (or 15, 16); 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.

**RELIGION** Eighteen hours in Religion including: one introductory course (from 20, 21, 22, 23); 100; one course from 101, 104, 108; 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, 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.

*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

- The student must have a minor advisor from the Statistics Program.
- 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:

- One course in calculus, e.g. 19, 20, 21, or 22, is required.
  - Three credits of introductory methods. 141 or 211 is recommended.
  - Three credits in courses in probability. 151 or 251 is recommended; 51 is acceptable for students who have not had two semesters of calculus.
  - 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).
- Experience in computing through relevant course work is required. This may be satisfied through computer experience gained in Statistics 201 (Statistical Analysis via Computer) or other courses approved by the minor advisor.

**THEATRE** 1; 5 or 10; 15 or 40; 125 or 126; one chosen from 127, 128, 129, or 130, 250.

**ZOOLOGY** Biology 1 and 2 (or Zoology 9 and Botany 4); three courses at the level of 100 or above, at least one of which must include a laboratory.

#### INTERDISCIPLINARY MINORS

**HISTORY AND PHILOSOPHY OF SCIENCE** History 21, 22; Philosophy 112; three hours chosen from History 128, 129; three hours from Philosophy 113 or 212; three hours chosen from Philosophy 113, 144, 212, 215, Math. 261, Sociology 248 or Special Topics. *Prerequisites*: Twelve hours of natural science, including three at the 100 level or above.

#### AREA AND INTERNATIONAL STUDIES

*Asian Studies*:

- Eighteen hours (six courses) in one of the following geographical areas: East and Southeast Asia or the Middle-East and South Asia. At least three of these courses must be at the 100 level or above.
- Nine of the 18 credit hours are to be presented through one course in each of the following three areas:\*
  - History
  - Social Analysis (i.e. relevant Political Science, Economics, Anthropology, or Geography courses)
  - Philosophy/Religion/Art

\*It is possible to substitute one year of an Asian-related language (e.g. Chinese, Japanese, or Hebrew) for one of the sub-100 level courses stipulated above. Additionally, extra-university experiences (such as study in Asia) may be granted credit at the discretion of the Asian Studies faculty provided there is a substantive demonstration of the benefits of the experience (i.e. a research paper or transferred academic credits). One Reading and Research course (197) may also be used to satisfy three of the "100-level or above" credits at the discretion of Asian Studies faculty members.

- The following lists, arranged into the appropriate geographical areas, indicate the possibilities for fulfilling the minor. In cases where the area focus is not explicit in the course title (e.g. Anthropology 177), the Asia-related content in the course is substantial and term-paper projects permit emphasis on Asian topics.

#### East and Southeast Asia

Anthropology 163  
Art 85, 186, 187, 188, 285\*\*  
Geography 58

History 31, 32, 131, 132  
 Philosophy 3, 121, 122, 221  
 Political Science 175, 176  
 Religion 21, 132, 141, 145

#### Middle-East and South Asia

Anthropology 165, 166, 170, 177  
 Art 186  
 History 35, 36, 105  
 Political Science 178  
 Religion 22, 23, 114, 116, 131

\*\*Course can be used in both geographical areas

*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:

1. Anthropology 162  
 Geography 51  
 History 37
2. Two courses chosen from among the following:  
 Agr. and Resource Economics 2, 272  
 \*Anthropology 170, 177, 179, 283  
 \*Economics 255, 256  
 \*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.

3. 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 Areas and International Studies 195 (Special Topics Seminars, taught by participating faculty members).

*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  
 English 135, 136  
 French 285, 286, 293  
 Geography 52, 210  
 History 75, 76, 175, 176, 284, 285  
 Political Science 173  
 Sociology 167

#### Latin American Studies:

1. Students who are not Spanish majors: 18 hours (six courses)
  - a. Completion of Spanish 52 or above (three hours).

- b. Completion of five of the following courses:  
 Anthropology 161, Economics 255, History 33, History 133 or History 134, Geography 56, Political Science 174, Spanish 185, 186, Area Studies 195 or 196.

2. Students who are Spanish majors: 18 hours (six courses)

- a. Completion of one of the following three courses: Spanish 285, 286, 293.

- b. 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

## COLLEGE HONORS

The honors program is designed for the superior student with unusual initiative and intellectual curiosity, and provides an opportunity to pursue a special project without the restrictions of classroom routine. Students enter a program of reading, research, or creation under the direction of the department of their choice.

Students in the College of Arts and Sciences who, at the end of their junior year, have an average of 3.20 or above for the work of the sophomore and junior years, and have attained the Dean's list for three semesters, may apply for college honors in a particular subject. Their program for the senior year must be approved not later than the end of the junior year by the department in which honors are sought and by the Committee on Honors, and they must present a satisfactory written report and pass an oral examination on the field of special study. Further information and an application form may be obtained in the Dean's Office.

## DEPARTMENTAL HONORS

Seniors whose overall average is 2.50 or above, or who have been specially recommended by the department in which they are concentrating, are eligible to take a comprehensive examination. Upon successfully completing the examination, they will be granted their degree "with Departmental Honors." Some departments have instituted seminars or other programs designed to help the student gain the requisite breadth and depth of knowledge.



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# The College of Education and Social Services

**T**he 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

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, early childhood, and special education. The American Primary Experience Program (A.P.E.X.) prepares teachers for grades kindergarten through third (K-3). 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. Students who desire early childhood or responsive teacher education certification endorsement must be enrolled in the College of Education and Social Services.

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 professionals for day care and pre-school, 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 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.

In cooperation with the College of Education and Social Services, the College of Agriculture offers programs in

Home Economics Education, Occupational and Extension Education, and Applied Technology. For further information, refer to sections in this catalogue describing the College of Agriculture.

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:

- Early Childhood Education —
  - Kindergarten and Primary
- Elementary Education —
  - General
  - Reading Concentration
  - Special Education
- Health Education
- Physical Education
- Secondary Education —
  - English
  - Speech and Theatre
  - 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
- Human Development Education
- 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 Fifth-Year Certificate 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 communication 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 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 a core sequence of nine semester hours 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 most states. Those completing a 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 and Field 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. Admission to the Social Work program occurs after students have completed the introductory courses and made application to become program majors.

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 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 and social 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	Psychology
Classics	Economics	Sociology
Speech and Theatre	Geography	
English	History	
Music	Political Science	

### Science and Mathematics:

Biology  
Botany  
Chemistry  
Computer Science  
Geology  
Environmental Studies  
Mathematics  
Physics  
Statistics  
Zoology

### Humanities:

Foreign Language  
Philosophy  
Religion

### Health and Physical

Education:  
Health Education  
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. Upon completion, graduates are eligible for Vermont teaching certification.

Elementary teacher certification for prospective teachers in grades K-3 may be obtained by enrolling in the Early Childhood Education Program (A.P.E.X) in the Department of Professional Education and Curriculum Development. Early Childhood certification (ages 0-8) 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 and Field Services, Waterman Building.

The professional programs begin by introducing the student to education as a field of study. The student is made aware of the social foundations and relationships of education as well as the resources available concerning the field. Emphasis is placed on the need for examining educational literature and research as part of the process of making critical judgments. Continuous field experiences are available throughout the four years. The program also includes special content courses for elementary teaching. Information concerning field experiences (deadlines, requirements, etc.) may be obtained from the Office for Student and Field Services, Waterman Building.

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
FRESHMAN YEAR	SEMESTER	
Educ./Gen'l 2	3	or 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
SOPHOMORE YEAR	SEMESTER	
Educ./Elem. 3 or 4	1	or 1
Math. 15, 16*	3	or 3
History 7 or 8*	3	or 3
Educ./Lrng. Stds. 45, 46	3	or 3

	1st	2nd
JUNIOR YEAR	SEMESTER	
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
Political Science 21*	3	or 3
General Educ. Electives and/or Approved Electives in Area of Concentration		

	1st	2nd
SENIOR YEAR	SEMESTER	
Phys. Educ. 100, 116	2	3
Educ./Gen'l 190	3	or 3
Educ./Elem. 181	8-12	or 8-12
General Educ. Electives Concentration Electives Reading		

\*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.

**Primary Grade Education (APEX)** The American Primary Experience Program is a two-year specialization for students who desire a K-6 teaching certification with an emphasis on teaching in the primary grades. The APEX program is an approach to learning that encourages preprofessional college students to explore their own developing teaching style. The program advocates working with children in a way that builds upon their developmental dispositions to learning the school curricula. This developmental perspective anchors a program philosophy that utilizes a broad range of curricular approaches tailored to a variety of learning styles. Classroom as community plays a large role in the APEX philosophy.

APEX students make application to the program at the end of their sophomore year. APEX encourages applications from students who are committed to the work of practicing the skills and developing the competence as a teacher, who are committed to understanding children's learning, and who have an enduring interest in relating school curriculum to children's natural dispositions to learn. In their junior year, APEX students are invited to carry out a sustained study of their desire to explore teaching. This focus is in-

formed by child study and school study. During second semester of their junior year, students focus on teaching behavior and curricular methods in a unique methods block that has a special emphasis on integrating the arts with the usual school curricula of language arts, science, mathematics, and social studies. In their senior year, students participate in a program supervised 15-week student teaching internship. All phases of student learning are applied in ongoing public school classroom work with teachers and school personnel who work actively with the program.

Students who complete APEX are granted K-6 certification from the State of Vermont. As with all College of Education and Social Services graduates, this certification is reciprocal with a number of other states. Student transcripts reflect the special nature of this program. Students interested in APEX should refer their questions to the APEX coordinator, 539 Waterman, 656-4189.

Courses taught within APEX include:

	1st	2nd
JUNIOR YEAR	SEMESTER	
Educ./Elem. 115	6	-
Educ./Elem. 144	-	3
Educ./Elem. 160	-	3
Educ./Elem. 122	-	3
Lively Arts Experience	-	3

	1st	2nd
SENIOR YEAR	SEMESTER	
Educ./Elem. 181	12	-
Educ./Elem. 186	3	3*

\*Optional

**The Reading Program** The Reading Program 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 are required to satisfy the speciality.

Questions concerning the Reading Program should be directed to the 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
Analysis of Reading Problems
Laboratory Experiences in Reading

**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, they 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
	1st	2nd
<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 secondary education curriculum includes a general component of a minimum of 60 credits selected from the following five academic areas: arts and letters, science and 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 and Field Services, Waterman Building. The program includes a planned sequence of professional courses and laboratory experiences.

## TEACHING FIELDS

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 48-50 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 and Field 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.

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 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 many cases, students must arrange to live off-campus during the student teaching assignment.

Applications for all field experiences must be made 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 for Student and Field Services, Waterman Building.

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./Gen'l 2	3	or 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		
	1st	2nd
<b>SOPHOMORE YEAR</b>	<b>SEMESTER</b>	
English Lit. Elective	3	or 3
Psychology 1	3	or 3
Educ./Lrng. Stds. 45, 46	3	or 3
General Educ. Electives or Approved Electives in Major and Minor or Broad Field		

	1st	2nd
JUNIOR YEAR	SEMESTER	
Educ./Sec. 6*	2	or 2
Educ./Sec. 178	-	3
Educ./Sec. 179		
(Educ./Sec. 182 for English Majors; and Educ./Sec. 294 for Communication Majors)	-	3
Educ. 137, 138	3	3

	1st	2nd
SENIOR YEAR	SEMESTER	
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
FRESHMAN YEAR	SEMESTER	
English	3	or 3
Speech 11, Theatre 5	3	or 3
Educ./Gen'l 2	3	or 3
Social Science	3	3
One Elective from Science and Math. Area	3	or 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
SOPHOMORE YEAR	SEMESTER	
English Lit. Elective	3	or 3
Psychology 1	3	3
Educ./Lrng. Stds., 45, 46	6	6
Studio Electives		
Related Electives		

	1st	2nd
JUNIOR YEAR	SEMESTER	
Educ./Art 177	4	-
Educ./Art 154	1-6	or 1-6
Art History	3	or 3
Educ./Sec. 1	2	or 2
Studio Electives		
Related Electives		
Teaching Reading	3	3

	1st	2nd
SENIOR YEAR	SEMESTER	
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 and 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
FRESHMAN YEAR	SEMESTER	
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
Non-Music Electives	6	6
Physical Education	1	1
	14-17	14-17
SOPHOMORE YEAR	SEMESTER	
Major Instrument (153, 154)	2	2
Ensemble	2	2
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
Learning and Human Development (EDLS 45 or 46)	3 or	3
Non-Music Electives	3 or	3
	<hr/>	<hr/>
	17	17

JUNIOR YEAR	1st SEMESTER	2nd SEMESTER
Major Instrument (251, 252)	2	2
Ensemble	2	2
Advanced Theory (231, 232)	3	3
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
Teach. Reading (EDEL 121)	3	-
Participation (EDSC 6)	1	1
	<hr/>	<hr/>
	18	16

SENIOR YEAR	1st SEMESTER	2nd SEMESTER
Major Instrument Recital (256)	-	2
Ensemble	-	2
Music Elective	-	3
Theory Elective	-	3
Repair Class (184)	-	1
Teaching of Reading (EDEL 122)	-	3
Student Teaching (ED 181)	12	-
Senior Seminar (ED 190)	3	-
	<hr/>	<hr/>
	15	14

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 Program focuses on individual development across the life span and on the person's relationship to his or her physical, social, and psychological environments. 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 develop skills in working with normal people of different ages and in a variety of settings. Field experience is required of all students.

Students major in one of three areas:

**Early Childhood Development** provides the student with academic and teaching experiences concentrating on the developmental needs of young children and their families. This is a state-approved teacher education program; graduates are recommended for teacher certification in Early Childhood (ages 0-8).

**Human Development and Family Studies** is an interdisciplinary study of people and their relationships across the span of life. The approach is ontogenetic and ecological.

Field work and small seminars permit the Human Development and Family Studies major to concentrate on a particular stage within the life cycle.

**Human Development Education** provides the student with a broad background in human development and family relationships along with professional teaching experience. Graduates are eligible for teacher certification in Home Economics with specialization in human development, family living, child care, and sex education.

Students in any of the three majors may co-enroll in the Home Economics Program (see page 38 for details). This requires completion of professional concentration course requirements as well as Home Economics core 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:

FRESHMAN YEAR	1st SEMESTER	2nd SEMESTER
Professional Courses:		
Soc. Work 2	3 or	3
Prerequisites for Soc. Work 165, 166:		
Political Science 21	3 or	3
Psychology 1	3 or	3
Sociology 10	3 or	3
Soc. Work 51 (optional)		
Biology 3	3 or	3

SOPHOMORE YEAR	1st SEMESTER	2nd SEMESTER
Professional Courses:		
Soc. Work 47	3 or	2
Soc. Work 48	3 or	3
Soc. Work 167	3 or	3
Soc. Work 6 (optional)		
Economics 11	3 or	2
Psychology 152		
(or junior year)	3	3

JUNIOR YEAR	1st SEMESTER	2nd SEMESTER
Professional Courses:		
Soc. Work 165	3	-
Soc. Work 166	-	3
Soc. Work 168	3 or	3
Soc. Work 169	3 or	3
Soc. Work 194	3	-
Psychology 152		
(or sophomore year)	3 or	3

SENIOR YEAR	1st SEMESTER	2nd SEMESTER
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.

A student must make formal application for admission to the professional Social Work Program. All students must

be accepted into the College of Education and Social Services before they can apply for major standing. The application to the Social Work Program is to be submitted while the student is enrolled in SWSS 48. Transfer students should make application for major standing in consultation with their advisor at the point of formal transfer to the 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 through 12 or in community health agencies. 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.

A typical program is as follows:

	1st	2nd
FRESHMAN YEAR	SEMESTER	
Educ./Gen'l 2	3	-
English 1	3	-
English Lit. Elective	-	3
Participation	X	-
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
	16	16

	1st	2nd
SOPHOMORE YEAR	SEMESTER	
Anatomy and Physiology <sup>4</sup>	4	3
Sociology 157	-	3
Educ./Lrng. Stds. 45, 46	3	3
Human Nutr. & Fds. 43 or 46	3	-
Early Childhd. & Human Dev. 65	-	3
Psychology 1	3	-
Teaching Reading	3	3
Educ./Phys. ED. 23	-	2
	16	17

	1st	2nd
JUNIOR YEAR	SEMESTER	
Educ. Organ. & Human Dev. 220 or Psychology 150	-	3
Educ./Hlth. 208	3	-
Educ./Hlth. 182	-	3
Educ./Hlth. (Community)	3	-
Sociology 254	-	3
Courses in Minor	9	9
	15	18

	1st	2nd
SENIOR YEAR <sup>5</sup>	SEMESTER	
Educ./Gen'l 190	3	-
Educ./Hlth. Electives	6	-
Electives	6	-
Educ./Gen'l 181	-	12
	15	12

<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)

<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.

The major program in physical education qualifies candidates to teach physical education in grades K-6, 7-12, or K-12 depending upon the major option 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. Candidates in all three major options will earn a minimum of eight credits in activity skill courses where they will demonstrate competency in a variety of sports from intermediate to advanced levels.

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
FRESHMAN YEAR	SEMESTER	
Educ./Gen'l 2	3	-
English 1	3	-
English Lit. Elective	-	3
Educ./Phys. Ed. 21	3	-
Educ./Hlth. 46	-	3
Psychology 1	-	3
Humanities <sup>1</sup>	-	3
Science Elective <sup>2</sup>	3	3
Speech 11 or Theatre 5	3	-
Activities	2	2
Participation	-	X
	17	17

	1st	2nd
SOPHOMORE YEAR	SEMESTER	
Social Science <sup>3</sup>	3	3
Educ./Lrng. Stds. 45, 46	3	3
Anatomy and Physiology <sup>4</sup>	4	3
Educ./Phys. Ed. 157	2	-
Educ./Phys. Ed. 192	-	3
Educ./Phys. Ed. Elective	3	3
Activities	2	2
	17	17

	1st	2nd
	SEMESTER	
JUNIOR YEAR		
Educ./Phys. Ed. 166	3	-
Educ./Phys. Ed. 167	-	3
Educ./Phys. Ed. 155	3	-
Educ./Phys. Ed. 104	5	-
Educ./Phys. Ed. 105	-	5
Coaching Elective	2	2
Educ./Phys. Ed. Elective	-	3
Teaching Reading	3	3
	<hr/>	<hr/>
	16	16

	1st	2nd
	SEMESTER	
SENIOR YEAR <sup>5</sup>		
Educ./Gen'l 190	3	-
Educ./Phys. Ed. 260	3	-
Educ./Phys. Ed. Electives	9	-
Elective	3	-
Educ./Gen'l 181	-	12
	<hr/>	<hr/>
	18	12

<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 math.)

<sup>3</sup>Social Science (six credits from History 7, 8, Political Science 11, 21)

<sup>4</sup>Anatomy and Physiology 19-20

<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 to nine 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.

**FIFTH-YEAR CERTIFICATE IN EDUCATION** 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 *Fifth-Year Certificate* 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 the Office for Student and Field Services, 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, and Integrated Studies. 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 and Field Services, Waterman Building.





# The Division of Engineering, Mathematics, and Business Administration

**T**he 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 Votey Building.

## DEGREE PROGRAMS

The Bachelor of Science degree is awarded for the following majors:

- Business Administration
- Civil Engineering
- Computer Science
- Electrical Engineering
- Management Engineering
- 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 at 322 South Prospect Street.

## 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.

### PHYSICAL EDUCATION

In addition to the course requirements listed for each curriculum, 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 credit must obtain approval from their department or School.

## 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 non-profit 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, we require 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 complete 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. We believe 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 also cooperates with the College of Engineering and Mathematics in offering a B.S. in Management Engineering. The course offerings are described under the "EMBA Division Programs" on page 85.

## 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:
 

English	Russian
French	Spanish
German	General Literature
Greek	Classics 22
Hebrew	Classics 42
Latin	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
Communications	Classics 42
Music	Theatre
Philosophy	

### 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. Technology 80 (three hours)
5. Two lab sciences\* (eight hours)
6. 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, 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 one or more of 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, undergraduates must:

- A. Have completed at least 54 credits with an average of 2.0 or better.  
B. Have a 2.25 grade-point average in the Freshman/Sophomore core.

### AREAS OF STUDY

A business student will normally take the following schedule:

	1st SEMESTER	2nd
FRESHMAN YEAR		
*Math. 19 or 21	3 or 4	-
English 1	3	-
Psychology 1 or Sociology 1	3	-
Electives	6 or 7	6 or 7
*Math. 20 or 22	-	3 or 4
History 7 or 8, or Political Science 21	-	3
English Elective	-	3
	<hr/> 15-17	<hr/> 15-17

	1st SEMESTER	2nd
SOPHOMORE YEAR		
*Economics 11, 12	3	3
*Computer Science 11	3	-
*Bus. Ad. 60	4	-
English Elective	3	-
Distribution Elective	3 or 4	3 or 4
*Statistics 141	-	3
*Bus. Ad. 61	-	4
*Technology 80	-	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, 229, 231, or Business Administration 177, 179, or 270.

	1st SEMESTER	2nd
JUNIOR YEAR		
Junior Business Core	12	12
Elective	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. 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 functional areas of Accounting, Finance, Human Resource Management, Management Information Systems, Marketing, or Operations Analysis. 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.

Beginning with the Class of 1987, students are required to achieve a cumulative average of 2.0 in the junior/senior business course work.

Students planning to sit for the CPA examination must complete the Professional Accounting Program outlined on page 82. Completion of the Professional Accounting Program satisfies the upper level elective business course requirement.

	1st SEMESTER	2nd
SENIOR YEAR		
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.

### UPPER LEVEL BUSINESS ELECTIVES BY FUNCTIONAL AREAS

#### Accounting

BSAD 161, 162	Intermediate Accounting	6
BSAD 164	Introduction to Federal Taxation	3
BSAD 168	Cost Accounting	3
BSAD 265	Accounting Theory	3
BSAD 266	Advanced Accounting	3
BSAD 267	Auditing	3

#### Finance

BSAD 181	Issues in Financial Management	3
BSAD 182	Security Valuation and Portfolio Management	3
BSAD 183	International Financial Management	3
BSAD 184	Financial Institutions and Markets	3
BSAD 185	Commercial Bank Management	3
BSAD 281	Municipal Finance	3

#### Human Resources Management

BSAD 121	Selected Topics in Organizational Behavior	3
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BSAD 122	Personnel Management	3
BSAD 123	Collective Bargaining and Conflict Resolution	3
BSAD 126	Current Issues in Management and Organization Theory	1-12

#### Management Information Systems

BSAD 142	Structured Business Programming—COBOL	3
BSAD 143	Structured Analysis and Design of Business Systems	3
BSAD 144	Data Base Development and Administration	3
BSAD 145	Managing the Information System Resource	3

#### Marketing

BSAD 155	Consumer Behavior	3
BSAD 156	Current Marketing Issues	3
BSAD 157	Marketing Research	3
BSAD 159	Topics in Marketing Management	3

#### Production and Operations Analysis

BSAD 174	Production and Operations Analysis II	3
BSAD 177	Decision Making Under Uncertainty	3
BSAD 178	Quality Assurance	3
BSAD 179	Introduction to Operations Research	3
BSAD 270	Applied Regression Analysis	3
BSAD 272/ CE 227	Discrete Simulation	3
BSAD 274/ ME 201	Safety Engineering	3
BSAD 275/ ME 275	Human Factors	3
BSAD 276/ ME 276	Plant Planning and Design	3
BSAD 277/ TECH 201	System Dynamics Seminar	3

#### Professional Accounting Program

BSAD 17	Business Law	3
BSAD 161-162	Intermediate Accounting	6
BSAD 164	Introduction to Federal Taxes	3
BSAD 168	Cost Accounting	3
BSAD 266	Advanced Accounting	3
BSAD 267	Auditing	3
BSAD 184	Financial Institutions and Markets	3

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#### International Management

The program in international management is open to all Business Administration majors and includes a full academic year in an overseas business program. Students are required to demonstrate foreign language proficiency beyond the intermediate level which may be accomplished by completing six hours beyond the intermediate level or by examination.

In 1984-85, the School will commence a program with the University of Nice. All instruction will be in French by professors of the University of Nice. Students will complete 10 courses, four of the junior core courses (except Business Administration 132), three or four international management electives, and two or three courses in European culture during their year at Nice.

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.

## 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: (1) Computer Science and Electrical Engineering, (2) Civil Engineering and Mechanical Engineering, and (3) 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.

Credit will not be given for more than three courses in the junior and senior curricula for which a grade of D or D- is earned.

## 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:* 15, 16 or 24, 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, or engineering. Students who wish to minor in mathematics or statistics may do so and are required to take only four courses numbered 200 or above in the area of their choice.

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	-
Physics 24, Fundamental, or Elective	-	4-3
Electives	6	3
CS 12, Comp. Prog. II	-	3
Math. 22, Calculus II	-	4
Speech 11	-	3
	16	17-16

	1st	2nd
SOPHOMORE YEAR	SEMESTER	
CS 101, Intro.	3	-
Math. 121, Calculus III	4	-
Math. 104, Computation	3	-
Physics 15 or 125, General	4	-
Elective	3	-
CS 102, Software	-	3
Math. 124, Linear Algebra	-	3
Math. 173, Comb. Theory	-	3
Physics 16, General, or Elective	-	4-3
Statistics 151, App. Prob.	-	3
	17	16-15

	1st	2nd
JUNIOR YEAR	SEMESTER	
CS 103, Prog. Languages	3	-
EE 100, EE Concepts	4	-
EE 131, Digital Comp. Design	3	-
Electives	6	9
CS 104, Data Structures	-	3
CS, 222 or 243	-	3
	16	15

	1st	2nd
SENIOR YEAR	SEMESTER	
CS 200-level courses	6	3
Electives	9	9
	15	12

## ENGINEERING CURRICULA

The College of Engineering and Mathematics offers professional programs in Civil, Electrical, and Mechanical Engineering accredited by the Accreditation Board for Engineering and Technology (ABET). Interdisciplinary engineering programs offered by the College include Management Engineering offered in cooperation with the School of Business Administration, and a curriculum 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. Each program has its own requirements, but all programs require at least 18 credits.

The humanities and social science electives must be selected from lists held by faculty advisors and the Assistant Dean. The courses must be chosen from the following categories: (1) language and literature; (2) fine arts, philosophy, and religion; and (3) social sciences. At least nine credits must be in one category, and at least six credits must be in one departmental area. (See page 55 for listings of departmental areas.) English 1 is required, but may not be included as a humanities and social science elective. No credit is granted for elementary language courses in the engineering curricula.

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	2nd
FRESHMAN YEAR	SEMESTER	
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 24, Fund. of Physics	-	4
Math. 31, Numerical Meth.	-	3
ME 2, Graph. Comm.	-	2
	17	16

\*In the Mechanical Engineering Option 2, Physics 24 is replaced by Chemistry 42. In the Electrical Engineering Options 3 and 4, Physics 24 is replaced by Chemistry 42 and 2 respectively, and ME

A minimum of 123 semester hours is required, plus two credits of physical education activities.

2 is not required. (In this Option, two HSS electives should be taken in the spring semester.) In the Civil Engineering Options 1 and 2, Math. 31 is replaced by a science elective and Chemistry 2 respectively.

**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 130 semester hours, plus two credits of physical education activities.

#### OPTIONS 1 and 2: General Civil Engineering and Environmental Engineering

	1st	2nd
SOPHOMORE YEAR	SEMESTER	
Math. 121, Calculus III	4	-
Physics 125, Fund. of Phys.	4	-
CE 1, Statistics	3	-
CE 10, Surveying	4	-
Statistics 141, Basic Meth.	3	-
Math. 271, App. Math. for Eng.	-	3
Math. 31, Numerical Meth.	-	3
ME 12, Dynamics	-	3
Option Course*	-	3
HSS Elective	-	3
	18	15

\*General civil engineering option students take CE 11; environmental engineering option students take Microbiology and Biochemistry 55 (Introductory Microbiology).

	1st	2nd
JUNIOR YEAR	SEMESTER	
CE 100, Mech. of Materials	3	-
CE 150, Env. Eng.	3	-
CE 160, Hydraulics	4	-
EE 100, Concepts	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
	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
	16	14

\*Professional electives are the following: any 200-level CE course or 191 or 192; other courses by permission of advisor.

\*\*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	-
CE 171, Struc. Analysis II	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**	-	4
	16	13

\*Design electives 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.

**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 the 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, Fund. of Physics	4	-
EE 3, Engr. Anal. I	3	-
EE 81, Soph. Lab	2	-
HSS Elective	3	3
Math. 271/124/Statistics 151	-	3
Physics 128, Modern Physics	-	4
EE 4, Engr. Anal. II	-	3
EE 82, Soph. Lab	-	2
EE 140, EM Field Theory	-	3
	16	18

	1st	2nd
JUNIOR YEAR	SEMESTER	
EE 120, Electronics I	3	-
EE 141, EM Field Theory	3	-
EE 163, Solid State Phys. I	3	-
EE 171, Signals and Sys. I	4	-
EE 183, Junior Lab	2	-
EE 121, Electronics II	-	3
EE 164, Solid State Phys. II	-	3
EE 134, Mini/Micro Comp.	-	4
EE 172, Signals and Sys. II	-	4
EE 184, Junior Lab	-	2
	15	16

	1st SEMESTER	2nd SEMESTER
SENIOR YEAR		
EE 113, Elec. Energy Dis.	3	-
EE 185, Senior Lab	1	-
Non-EE Eng. Sci. Elective	3	-
Tech. Electives	6	-
HSS Elective	3	3
EE 146, Wave and Diff.	-	3
EE 186, Senior Lab	-	1
Tech. Elective	-	3
Approved Elective	-	3
EE Eng. Sci. Elective	-	3
	<hr/> 16	<hr/> 16

**OPTION 2: Computer Engineering**

	1st SEMESTER	2nd SEMESTER
SOPHOMORE YEAR		
Math. 121, Calculus III	4	-
Physics 125, Fund. of Phys.	4	-
EE 3, 4, Eng. 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.	-	4
HSS Elective	-	3
	<hr/> 16	<hr/> 18

	1st SEMESTER	2nd SEMESTER
JUNIOR YEAR		
EE 163, Solid State	3	-
HSS Elective	3	-
EE 120, 121, Elec. I & II	3	3
EE 171, 172, Signals and Sys.	4	4
EE 183, 184, Junior Lab	2	2
EE 134, Mini/Micro	-	4
EE 140, Field Theory	-	3
	<hr/> 15	<hr/> 16

	1st SEMESTER	2nd SEMESTER
SENIOR YEAR		
EE 141, Field Theory	3	-
EE 187, Senior Proj.	3	-
CS 12, Prog. II	3	-
CS 101, Intro.	3	-
HSS Elective	3	3
EE 185, 186, Senior Lab	1	1
CS 102, Software	-	3
Technical Elective	-	3
Non-Eng. Sci. Elective	-	3
EE Eng. Sci. Elective	-	3
	<hr/> 16	<hr/> 16

**OPTIONS 3 and 4: Biomedical and Premedical**

	1st SEMESTER	2nd SEMESTER
SOPHOMORE YEAR		
Math. 121, Calculus III	4	-
Physics 15, Gen. Physics	4	-
Biology 1, Prin. of Bio.	4	-
HSS Electives	3	6
Math. 124/271/Statistics 151	-	3
Physics 16, General Phys.	-	4
Biology 2, Prin. of Bio.	-	4
	<hr/> 15	<hr/> 17

**OPTION 3: Biomedical Engineering**

	1st SEMESTER	2nd SEMESTER
JUNIOR YEAR		
EE 3, Eng. Analysis I	3	-
Physiology & Biophys. 101	5	-
CE 1, Statics	3	-
EE 163, Solid State I	3	-
EE 134, Mini/Micro	-	4
EE 4, Eng. Analysis II	-	3
EE 81, 82, Soph. Lab	2	2
EE 140, Elec. Field	-	3
Physiology & Biophys. 102	-	5
	<hr/> 16	<hr/> 17

	1st SEMESTER	2nd SEMESTER
SENIOR YEAR		
EE 141, Elec. Field	3	-
ME 41, Thermo.	4	-
EE 120, 121, Electronics I & II	3	3
EE 171, 172, Signals and Sys.	4	4
EE 183, 184, Junior Lab	2	2
EE 185, 186, Senior Lab	1	1
EE Eng. Sci. Elective	-	3
	<hr/> 17	<hr/> 13

**OPTION 4: Premedical Engineering**

	1st SEMESTER	2nd SEMESTER
JUNIOR YEAR		
EE 163, Solid State 1	3	-
Non-EE Eng. Sci. Elective	3	-
EE 3, 4, Eng. Analysis I & II	3	3
EE 81, 82, Soph. Lab	2	2
Chemistry 141, 142, Organic	4	4
EE 134, Mini/Micro	-	4
EE 140, Elec. Field	-	3
	<hr/> 15	<hr/> 16

	1st SEMESTER	2nd SEMESTER
SENIOR YEAR		
EE 113, Energy Dist.	3	-
EE 141, Elec. Field	3	-
EE 120, 121, Electronics I & II	3	3
EE 171, 172, Signals and Sys.	4	4
EE 183, 184, Junior Lab	2	2
EE 185, 186, Senior Lab	1	1
EE 146, Wave and Diff.	-	3
EE Eng. Sci. Elective	-	3
	<hr/> 16	<hr/> 16

**MANAGEMENT ENGINEERING** A curriculum in Management Engineering, leading to the degree of Bachelor of Science in Management Engineering, is offered in cooperation with the School of Business Administration. The curriculum is designed to provide a sequential development from the areas of mathematics, basic sciences, engineering sciences, accounting, and economics to advanced courses in management and industrial engineering, which incorporate design (decision-making processes) along with a senior project. 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 129 semester hours plus two credits of physical education activities.





	1st	2nd
SOPHOMORE YEAR	SEMESTER	
Math. 121, Calculus III	4	-
Physics 125, Fund. of Phys.	4	-
CE 1, Statics	3	-
Economics 11, 12, Prin. of Econ.	3	3
BSAD 60, 61, Accounting	4	4
ME 12, Dynamics	-	3
ME 14, Mech. of Solids	-	3
Math. 271, App. Math. for Eng.	-	3
	<hr/> 18	<hr/> 16

	1st	2nd
JUNIOR YEAR	SEMESTER	
ME 41, Thermo.	4	-
Statistics 211, Methods I	3	-
BSAD 120, Prin. of Mgmt.	3	-
BSAD 141, Mgmt. Info. Systems	3	-
EE 100, 101, Concepts I & II	4	4
Tech. 80, Sys. Modeling	-	3
BSAD 173, Oper. Analysis	-	3
Physics 128, Intro.	-	4
HSS Elective	-	3
	<hr/> 17	<hr/> 17

	1st	2nd
SENIOR YEAR	SEMESTER	
Tech. 185, Sr. Project	3	-
ME 175, Human Factors	3	-
CE 125, Eng. Economy	3	-
HSS Elective	3	-
Concentration Elec.*	3	3
ME 176, Plant Planning	-	4
BSAD 178, Qual. Assurance	-	3
BSAD 179, Oper. Research	-	3
	<hr/> 15	<hr/> 13

\*Concentration Electives: ME 101, Materials I; ME 111, System Dynamics; CE 227, Discrete Simulation; Tech. 201, System Dynamics Seminar.

**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 128 credit hours for Option 1 and 130 credit hours for Option 2. In addition, two credits of physical education activities are required.

	1st	2nd
SOPHOMORE YEAR	SEMESTER	
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, Eng. Thermo	-	3
	<hr/> 18	<hr/> 16

\*General mechanical engineering option students take Physics 125 and 128; biomedical engineering option students take Physics 15 and 16.

#### OPTION 1: General Mechanical Engineering

	1st	2nd
JUNIOR YEAR	SEMESTER	
ME 101, Materials I	3	-
ME 111, Sys. Dynamics	3	-
ME 143, Fluid Mech.	3	-
EE 100, Concepts	4	-
ME 123, Junior Lab	1	-
HSS Elective	3	-
ME 102, Materials II	-	3
ME 144, Basic Heat Trans.	-	3
EE 101, Circuits and Ins.	-	4
ME 124, Junior Lab	-	1
ME 170, Mech. Design I	-	4
	<hr/> 17	<hr/> 15

	1st	2nd
SENIOR YEAR	SEMESTER	
ME 161, Manufacturing	3	-
ME 171, Mech. Design II	3	-
ME 185, Sr. Project	2	-
ME 253, Tribology I	4	-
Tech. Electives*	3	3
ME 162, Manufacturing II or ME 172, Mech. Design III	-	4
ME 186, Sr. Project	-	1
HSS Electives	-	6
	<hr/> 15	<hr/> 14

\*Technical electives (2): Any 100-level or above courses in Division of EMBA, or in Physical or Life Sciences, with permission of advisor.

#### OPTION 2: Biomedical Engineering

	1st	2nd
JUNIOR YEAR	SEMESTER	
Biology 1, Prin. of Bio.	4	-
ME 101, Materials I	3	-
ME 123, Junior Lab	1	-
ME 111, Systems Dyn.	3	-
ME 132, Fluid Mech.	3	-
HSS Electives	3	3
Biology 2, Prin. of Bio.	-	4
ME 170, Mech. Design I	-	4
ME 124, Junior Lab	-	1
ME 102, Materials II	-	3
	<hr/> 17	<hr/> 15

	1st	2nd
SENIOR YEAR	SEMESTER	
EE 100, Concepts I	4	-
ME 171, Mech. Design II	3	-
ME 185, Sr. Project	2	-
Physiology & Biophys. 101	5	-
EE 101, Concepts II	-	4
ME 172, Mech. Design III	-	4
ME 186, Sr. Project	-	1
Physiology & Biophys. 102	-	5
HSS Elective	-	3
	<hr/> 14	<hr/> 17

## 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,  
Mathematics, and Statistics

Math. 21, 22, 102, 121, 124.  
Computer Science 11.

In addition to the core curriculum (above), candidates for the B.S. degree in Mathematics must complete the following requirements:

A. *Major Courses.* Twenty-seven additional hours in Mathematics, Statistics, or Computer Science courses numbered 100 or above. Of these 27 hours, at least 21 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	(5) Agricultural Sciences
(2) Biological Sciences	(6) Business Administration
(3) Medical Sciences	(7) Psychology
(4) Engineering	(8) Economics

Of these 24 hours, at least six hours must be in courses numbered 100 or above and at least six must be taken in the fields (1)-(4).

C. *Humanities and Social Sciences.* Twenty-four hours selected from categories A, B, C on page 80. 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:

**Pre-Graduate 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 non-mathematical 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, 218, 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, Statistics 229 and Physics 24, 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, plan 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, 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:

- a. Mathematical Science courses must include 21 semester hours of Statistics including 141 or 211, 151 or 251, 241 or 262, 221 or 227 or 229, and 281.
- b. 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.

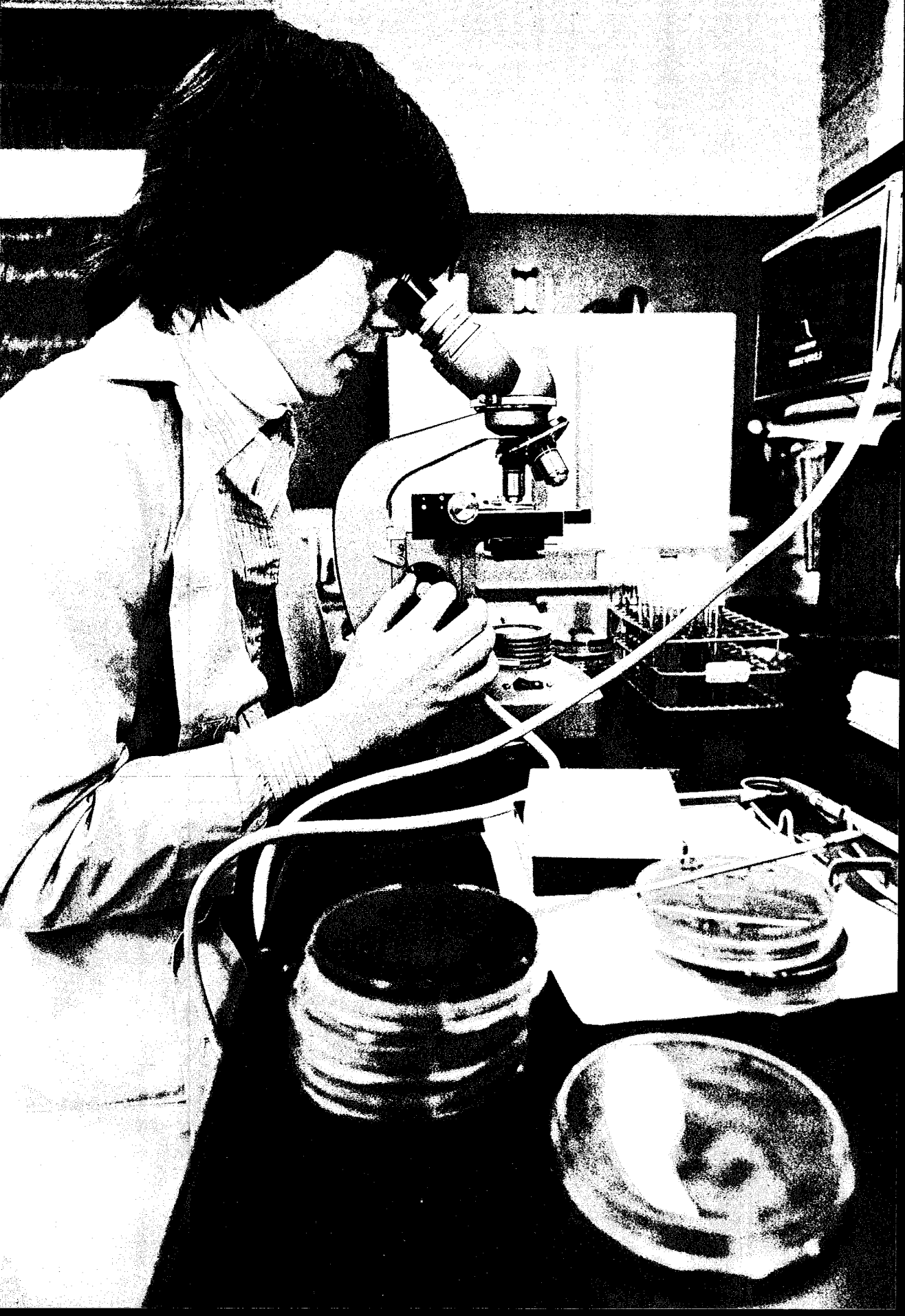
- c. Humanities and Social Sciences must include English 1 and Speech 11.

**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 15, 16), 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 our community. It encourages interaction among its students and faculty in meeting this need. 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 will be available upon request from the Director's and departmental offices.

The offices of the Director 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
- Radiographic Technology

## 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 Allied Health Sciences 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.

	1st	2nd
FIRST YEAR	SEMESTER	
Dental Hygiene Core 3-4	7	5
Human Nutrition & Foods 46	3	-
Anatomy & Physiology 9-10	4	4
English 1 (or higher level)	3	-
Dental Hygiene 61	-	2
Chemistry 3	-	4
Psychology 1	-	3
Physical Education	1	-
	18	18
SECOND YEAR	SEMESTER	
Dental Hygiene 145-146	5	2
Dental Hygiene 71	1	-
Dental Hygiene 181-182	4	4
Microbiology 55	4	-

Speech 11	-	3
Dental Hygiene 62	-	3
Dental Hygiene 91	2	-
Sociology or Anthropology	-	3
Elective	-	3
	<hr/>	<hr/>
	16	18

A minimum of 70 approved semester hours and a grade-point average of 2.0 is required for the Associate 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 Committee 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 the certification process are explained during the final year.

	1st	2nd
FIRST YEAR	SEMESTER	
Chemistry 1-2	4	4
Anatomy & Physiology 9-10	4	4
Medical Technology 3	1	-
English	3	-
Math. (by placement)	3	-
Statistics 111 or 141	-	3
Electives	-	6
Physical Education	1	1
	<hr/>	<hr/>
	16	18

	1st	2nd
SECOND YEAR	SEMESTER	
Medical Technology 23	4	-
Medical Technology 61	2	-
Medical Technology 34	-	3
Medical Technology 54	-	2
Chemistry 42	-	4
(or Chemistry 141, 142)	(4)	(4)
Microbiology 55	-	2
Computer Science 11	3	-
Electives	3-6	3-6
	<hr/>	<hr/>
	15-16	14-17

	1st	2nd
THIRD YEAR	SEMESTER	
Biochemistry 211-212	4	4
Physics 11-12 (15-16)	4	4
Med. Microbiology 220	4	-
Medical Technology 142	-	4
Medical Technology 102	-	2
Elective	3	3
	<hr/>	<hr/>
	15	17

	1st	2nd
FOURTH YEAR	SEMESTER	
Medical Technology 120-130-150-160	2.5-4	2.5-4
Medical Technology 131	3	-
Medical Technology 155	3	-
Medical Technology 122	-	3
Medical Technology 162	-	3
Medical Technology 195	3	-
Medical Technology 196	-	2
Medical Technology 197	1	-
Pathology 101	3	-
Elective	-	3
	<hr/>	<hr/>
	15.5-17	13.5-15

A minimum of 126 semester credit hours including two credit hours of physical education and a grade-point average of 2.0 are required for graduation in the baccalaureate program.

**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 program 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 is:

	1st	2nd
FIRST YEAR	SEMESTER	
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*	1	-
	<hr/>	<hr/>
	16	18

\*Optional/Advisor

† If Psych. 1 is taken in the first semester.

+ First or second semester.

	1st	2nd
SECOND YEAR	SEMESTER	
Mech. Engineering 93	4	-
Elec. Engineering 94	-	4
Anatomy 201	5	-
Physiology 101	-	5

Physical Therapy 21, 22	3	3
Physical Therapy 110	-	3
Electives*	6	3
	<hr/> 18	<hr/> 18

\*Optional/Advisor

	1st SEMESTER	2nd SEMESTER
THIRD YEAR		
Anatomy 202	3	-
Physiology 102	5	-
Pathology 101	3	-
Physical Therapy 121-122	3	3
Physical Therapy 124	-	5
Physical Therapy 131-132	1	1
Physical Therapy 144	-	2
Physical Therapy 142*	-	2
Physical Therapy 128 (Seminar)	-	1
Electives*	3	-
Statistics	-	3
	<hr/> 18	<hr/> 17

\*Optional/Advisor

	1st SEMESTER	2nd SEMESTER
FOURTH YEAR		
Physical Therapy 151-152	5	3
Psychology 295	3	-
Physical Therapy 133	2	-
Pharmacology 190	-	2
Physical Therapy 158	-	6
Physical Therapy 173-174	2	2
Physical Therapy 176	-	2
Electives*	6	-
	<hr/> 18	<hr/> 15

\*Optional/Advisor

#### THIRD-YEAR SUMMER PROGRAM (Mid-May-June)

Physical Therapy 128 (Clinical) 3

A minimum of 124 credits are required for graduation, to include six credits in the humanities and 19 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. 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 (P.T. 128, P.T. 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 northeastern United States. 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 three 24-month programs leading to the Associate in Science degree.

**Radiography Program:** Preparation for a career in operating X-ray equipment to obtain diagnostic information on patients.

**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 experience with patients 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.

All three 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
FIRST YEAR		
Anatomy & Physiology 9-10	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	-	3
Distribution	-	3
	<hr/> 16	<hr/> 17

#### SUMMER SESSION

Radiologic Tech. 77	3	
	1st SEMESTER	2nd SEMESTER
SECOND YEAR		
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
	<hr/> 15	<hr/> 13

#### SUMMER SESSION

Radiologic Tech. 177	3
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**Radiography**

	1st SEMESTER	2nd SEMESTER
FIRST YEAR		
Radiologic Tech. 15	-	2
Math. (by placement)	3	-
Physical Education	-	1
Radiologic Tech. 1	3	-
Radiologic Tech. 11, 12	3	3
English	3	-
Radiologic Tech. 4	3	-
Radiologic Tech. 13, 14	2	3
Speech 11	-	3
Computer Science 3 or 11	-	3
	17	15

**SUMMER SESSION**

Radiologic Tech. 77 3

**SECOND YEAR**

	1st SEMESTER	2nd SEMESTER
Distribution A	-	3
Radiologic Tech. 111	4	-
Radiologic Tech. 113, 114	4	4
Radiologic Tech. 115	3	-
Radiologic Tech. 110	-	2
Anatomy & Physiology 9-10	4	4
Elective	-	1
	15	14

**SUMMER SESSION**

Radiologic Tech. 177 3

**Radiation Therapy Technology**

	1st SEMESTER	2nd SEMESTER
FIRST YEAR		
Anatomy & Physiology 9-10	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	-
Distribution	-	3
	16	14

**SUMMER SESSION**

Radiologic Tech. 77 3

**SECOND YEAR**

	1st SEMESTER	2nd SEMESTER
Speech 11	3	-
Radiologic Tech. 121, 122	3	4
Radiologic Tech. 123, 124	3	3
Radiologic Tech. 125, 126	3	2
Electives	2	2
Computer Science 3 or 11	3	-
Distribution	-	3
	17	14

**SUMMER SESSION**

Radiologic Tech. 177 3

**DISTRIBUTION** (at least one three-credit course from two of the three categories).

- A. Anthropology, human development, philosophy, psychology, religion, sociology, political science, history, military studies.
- B. Economics, environmental studies, geology, geography, natural resources, art history, agricultural economics, business administration, forestry, music history, literature, nutrition, plant and soil science.
- C. Theatre, music theory and composition, studio art, classics, German, Hebrew, French, Spanish, Russian, music performance.

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 degree in this curriculum.

**COORDINATORS AT CLINICAL AFFILIATIONS****NUCLEAR MEDICINE TECHNOLOGY**

Bohannon, Jean, R. T.; Medical Center Hospital of Vermont, Burlington, VT

Tierney, Denise, R. T.; Maine Medical Center, Portland, ME

Kieran, James, R. T.; Winchester Memorial Hospital, Winchester, MA

Martinichio, Michael; Albany Medical Center, Albany, NY

O'Brien, Patrick, R. T.; Mary Hitchcock Medical Center, Hanover, NH

Rich, Dayton, R. T.; Hartford Hospital, Hartford, CT

**RADIOGRAPHY**

Amadon, Karen, R. T.; Mary Hitchcock Medical Center, Hanover, NH

Canalas, Richard, R. T.; Central Vermont Medical, Berlin, VT

Cunningham, Dan, R. T.; Medical Center Hospital of Vermont, Burlington, VT

Jones, Karl, R. T.; Putnam Memorial Hospital, Bennington, VT

Leible, Brenda, R. T.; Fanny Allen Hospital, Winooski, VT

Leible, Paul, R. T.; Northwestern Medical Center, St. Albans, VT

Tidd, Joel, R. T.; Brattleboro Memorial Hospital, Brattleboro, VT

**RADIATION THERAPY TECHNOLOGY**

Jones, Gisela, R. T. T.; Mary Hitchcock Medical Center, Hanover, NH

Morley, Patricia, R. T. T.; Medical Center Hospital of Vermont, Burlington, VT

Powel-Smith, Carol; R. T. T.; Eliot Hospital, Manchester, NH

McCarthy, Kathy, R. T. T.; Massachusetts General Hospital, Boston, MA

*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 course in chemistry and biology is required and one additional year of science in the senior year is highly recommended. For the Associate degree program, a high school course in biology is required and chemistry and physics are recommended.

Financial aid is available in the form of scholarships, loans, prizes, and employment (see section on Financial Aid).

The offices of the Director 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. For seniors in the baccalaureate program, it is required that a car be available for use in community 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 and Biochemistry 55, and a grade of "C" or better in Professional Nursing 26, 125-126, 225, 226, and 252.

A typical program of studies follows:

	1st SEMESTER	2nd SEMESTER
<b>FRESHMAN YEAR</b>		
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
	<hr/> 17	<hr/> 17
<b>SOPHOMORE YEAR</b>		
Early Childhood & Human Development 80-81	3	3
Micro. and Biochem. 55	4	-
Anatomy & Physiology 19-20	4	4
Prof. Nursing 25	-	3
Prof. Nursing 26	-	3
Human Nutr. & Foods 141	-	3
Electives	6	-
	<hr/> 17	<hr/> 16
<b>JUNIOR YEAR</b>		
Prof. Nursing 125	9	-
Prof. Nursing 126	-	9
Electives	6	6
	<hr/> 15	<hr/> 15
<b>SENIOR YEAR</b>		
Prof. Nursing 225	9	-
Prof. Nursing 226	-	9
Prof. Nursing 251	3	-
Prof. Nursing 252	-	6
Elective	3	-
	<hr/> 15	<hr/> 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 — 15 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 9-10, and a grade of "C" or better in Technical Nursing 15-16, 123-124, and 130.

A typical program of studies follows:

	1st SEMESTER	2nd
FIRST YEAR		
English 1 or English Elective	-	3
Early Childhood & Human Development 80-81	3	3
Anatomy & Physiology 9-10	4	4
Human Nutr. & Foods 46	3	-
Tech. Nursing 15-16	6	6
Physical Education*	-	1
	16	17

	1st SEMESTER	2nd
SECOND YEAR		
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 or humanity 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. There is a seven-year time limit on certain science requirements.

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 REGISTERED NURSES

The advanced standing policies outlined above 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 for Vermont registered nurses. 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.

### CONTINUING EDUCATION

The School of Nursing sponsors continuing education programs which are offered in different locations within the state to meet the needs of registered nurses. The School cooperates with health-related agencies, institutions, and professional organizations in sponsoring additional programs. A tentative schedule for each year can be obtained from the School of Nursing.

## 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 the student and his or her advisor is of central importance to this atmosphere. Faculty members are conscientious academic advisors and students frequently communicate with their advisors 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 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 Director of the School is located in the George D. Aiken Center for Natural Resources.

## ORGANIZATION

The School consists of academic programs in 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:

- Forestry
- Recreation Management
- Resource Economics
- Wildlife and Fisheries Biology
- Environmental Studies-Natural Resources

(Students interested in studying natural resources, but who wish to postpone their decision on a specific major, enroll in the Undecided category.)

## DEGREE REQUIREMENTS

The minimum cumulative grade-point requirement for the Bachelor of Science degree in the School of Natural Resources is 2.00. Additionally, a student must successfully complete the following:

- A. 120 credit hours;
- B. A minimum of 30 hours in courses taught within the School of Natural Resources;
- C. A minimum of three courses and at least nine credit hours in each of the following five areas: natural sciences, quantitative sciences, communications, social sciences, and arts and humanities; and
- D. Further requirements as specified by the individual's academic program.

## AREAS OF STUDY

**FORESTRY** The program in Forestry provides a liberal education in the humanities and sciences and a professional education in forestry. The professional core emphasizes the science and techniques of coordinating the management of forest and wild lands for forest products, water, wildlife, and recreation. The program is designed to prepare individuals for positions in forestry or for graduate study in the forest sciences. A non-professional minor option in forestry is available on a limited basis. Consult the department for details.

A minimum of 130 credit hours of prescribed and elective courses is required for graduation.

	1st	2nd
FRESHMAN YEAR	SEMESTER	
Math. 19, Calculus I <sup>1</sup>	3	-
Zoology 9, Gen'l Zool.	4	-
Botany 4, Intro. Plant Biol.	-	-
For. 1, Intro. to Forestry	3	-
English <sup>5</sup>	3	-
Chemistry 3, Gen'l Chem.	-	-
Physical Educ.	1	1
Other Courses <sup>4,5</sup>	0-3	6-7

	1st	2nd
SOPHOMORE YEAR	SEMESTER	
Statistics 141, Basic Meth.	3	-
Civil Engr. 12, Plane Surv.	4	-
For. 5, Dendrology	4	-
Plant and Soil Sci. 161, Intro. Soil Sci.	4	-
For. 120, Forest Ecology	-	4
For. 140, For. Biometry I	-	4
Computer Science 11, Prgrmg. I	-	3
Other Courses <sup>4,5</sup>	0-3	5-6

## SUMMER FIELD PROGRAM

- For 122, Forest Ecosystems Analysis 4
- For. 142, Forest Biometry II 4

	1st	2nd
JUNIOR YEAR	SEMESTER	
For. 123, Silviculture	4	-
For. 151, For. Econ.	3	-
For. 162, Wood Tech.	3	-
Other Courses <sup>2,3,4,5</sup>	5-6	15
SENIOR YEAR	SEMESTER	
For. 163, Timber Harvest.	3	-
For. 251, For. Policy and Administration	3	-
For. 272, Forest Mgmt.	-	3
Other Courses <sup>3,4,5</sup>	9	12
Total Program Requirements, Semester Hours		130

<sup>1</sup> Students not qualified to enter Math. 19 will take Math. 10 during the first semester followed by Math. 19 during the second semester.

<sup>2</sup> Two courses in forest protection (Forestry 132, 133, 134) must be taken during the junior and senior years.

<sup>3</sup> Two courses in Natural Resources from an approved list must be taken during the junior and senior years.

<sup>4</sup> All students must complete the following requirements in the arts, humanities, and social sciences:

- a. one course in economics prior to Forestry 151;
- b. two courses in social sciences from anthropology, economics, geography, political science, psychology, or sociology; and
- c. three courses in the arts and humanities from art, classics, English, foreign language literature, history, music, philosophy, religion, or theatre.

<sup>5</sup> All students must complete the following requirements in English and communication:

- a. one course from English 1, 50 or 53;
- b. Speech 11, Effective Speaking; and
- c. one communication elective course from an approved list.

**WILDLIFE AND FISHERIES BIOLOGY** This program prepares individuals for professional careers requiring expertise in wildlife and fisheries biology and ecology. Required courses in this program meet the minimum recommendations of The Wildlife Society for professional training, 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 must 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 biology, or other positions in wildlife or fisheries biology.

Completion of 127 semester hours of credit in core and elective courses is required for the Bachelor of Science degree.

	1st	2nd
FRESHMAN YEAR	SEMESTER	
Biol. 1,2 or Botany 4, Zool. 9,		
Intro. Biol.	4	4
Chemistry 3 and 4 or 42,		
Intro. Chemistry	4	4
Math. 19, Calculus I <sup>1</sup>	3	-
English 1 or 50, Comm. <sup>2</sup>	-	3
Wildlife and Fish. Biol. 83,		
Intro. Seminar	-	1
Physical Educ.	1	1
Electives <sup>3</sup>	3	3

#### Wildlife Biology Option

	1st	2nd
SOPHOMORE YEAR	SEMESTER	
Forestry 5, Dendrology	4	

Nat. Res. 25, Elem. Nat. Res. Meas. & Map.	4	-
Plant and Soil Sci. 161, Intro. Soils	4	-
Statistics 141, Basic Meth.	3	-
Computer Sci. 11, Computer Program.	-	3
Forestry 120, Forest Ecology	-	4
Wildlife and Fish. Biol. 174, Princ. of Wildlife Mgmt.	-	3
Wildlife and Fish. Biol. 130,		
Ornithology	-	3
Communication <sup>2</sup>	-	3
Electives <sup>3</sup>	-	3

#### SUMMER PROGRAM

Wildlife and Fish. Biol. 131, Field Ornithology	2	
Wildlife and Fish. Biol. 150, Wildlife Habitat and Pop. Measurements	2	
Wildlife and Fish. Biol. 186, Special Topics	1	

	1st	2nd
JUNIOR YEAR	SEMESTER	
Wildlife and Fish. Biol. 161, Fisheries Biol.	4	-
Biology 102, Environ. Biol.	4	-
Botany 109, Plant Taxonomy	4	-
One course from Wildlife and Fish. Biol. 165 and 264, Nongame/Endangered Species Mgmt.	0-3	0-3
One course from Biol. 101, Zool. 104, Zool. 219, Genetics/Structure/Function	0-3	0-4
Biology 103, Cell Structure	4	-
Communication <sup>2</sup>	3	3
Electives <sup>3</sup>	-	3-6

	1st	2nd
SENIOR YEAR	SEMESTER	
Wildlife and Fish. Biol. 275, Wildlife Behavior	3	-
Wildlife and Fish. Biol. 271/273, 274, Wildlife Ecology/Mgmt.	0-4	0-4
Two courses from Zool. 203, 209, 217, 219, Wildlife and Fish. Biol. 232, Vert. Biol.	4	3
Natural Res. Law, Planning, Policy (two courses)	3	3
Electives <sup>3</sup>	0-3	4-8

#### Wildlife Management Option

	1st	2nd
SOPHOMORE YEAR	SEMESTER	
Forestry 5, Dendrology	4	-
Nat. Res. 25, Elem. Nat. Res. Meas. & Map.	4	-
Plant and Soil Sci. 161, Intro. Soils	4	-
Statistics 141, Basic Methods	3	-
Forestry 120, Forest Ecology	-	4
Wildlife and Fish. Biol. 174, Princ. of Wildlife Mgmt.	-	3
Wildlife and Fish. Biol. 130,		
Ornithology	-	3
Computer Sci. 11, Computer Program.	-	3
Communication <sup>2</sup>	3	-
Electives <sup>3</sup>	-	3

## SUMMER PROGRAM

Wildlife and Fish. Biol. 131, Field Ornithology	2	
Wildlife and Fish. Biol. 150, Wildlife Habitat and Pop. Measurements	2	
Wildlife and Fish. Biol. 186, Special Topics	1	

## JUNIOR YEAR

	1st SEMESTER	2nd SEMESTER
Wildlife and Fish. Biol. 161, Fish. Biol. Two courses from Forestry 123, Forestry 132, Forestry 146, Forest Mgmt.	4	-
One course from Zool. 217, Mammalogy, Zool. 219, Comp. Anatomy	0-4	3-6
Forestry 140, Forest Biometry	0-4	0-4
Communication <sup>2</sup>	-	4
Electives <sup>3</sup>	3	3
	0-6	0-6

## SENIOR YEAR

	1st SEMESTER	2nd SEMESTER
Wildlife and Fish. Biol. 251, Wildlife Habitat and Pop. Analysis	2	-
Botany 109, Plant Taxonomy	4	-
Two courses from Wildlife and Fish. Biol. 264, 271/273, 274, Wildlife Ecol. Mgmt.	0-4	3-7
Nat. Res. Law, Planning and Policy, (2 courses)	0-6	0-6
Electives <sup>3</sup>	2-8	0-8

## Fisheries Biology Option

	1st SEMESTER	2nd SEMESTER
SOPHOMORE YEAR		
Statistics 141, Basic Meth.	3	-
Nat. Res. 25, Elem. Nat. Res. Meas & Map.	4	-
Plant and Soil Sci. 161, Intro. Soils	4	-
Biol. 103, Cell Structure	4	-
Forestry 120, Forest Ecology	-	4
Nat. Res. 102, Water as a Nat. Res.	-	3
Wildlife and Fish. Biol. 174, Princ. of Wildlife Mgmt.	-	3
Communication <sup>2</sup>	-	3
Electives <sup>3</sup>	-	3

## SUMMER PROGRAM

Wildlife and Fish. Biol. 150, Wildlife Habitat and Pop. Measurements	2	
Wildlife and Fish. Biol. 186, Special Topics	1	

## JUNIOR YEAR

	1st SEMESTER	2nd SEMESTER
Wildlife and Fish. Biol. 161, Fish. Biol.	4	-
Biol. 102, Env. Biol.	4	-
Computer Sci. 11, Computer Program.	3	-
Zool. 236, Limnology	4	-
Zool. 104, Structure/Function	-	4
Wildlife and Fish. Biol. 232, Ichthyology	-	4
Wildlife and Fish. Biol. 275, Wildlife Behavior	3	-
Communication <sup>2</sup>	3	3
Electives <sup>3</sup>	-	6

## SENIOR YEAR

	1st SEMESTER	2nd SEMESTER
Wildlife and Fish. Biol. 271/273, Wetlands Ecology/Mgmt.	4	-
Biol. 203, Pop. Ecology	3	-
Zool. 237, Ecology of Running Waters	-	4
Nat. Res. 278, Water Res.	-	3
Nat. Res. Law, Planning, Policy (2 courses)	3	3
Communication <sup>2</sup>	3	-
Electives <sup>3</sup>	4	4

Total Program Requirements, Semester 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> Communication requirements for all students: English 1 or 50, Speech 11 plus two additional courses from an approved list.

<sup>3</sup> All students must complete the following requirements in arts, humanities, and social sciences:

- one course in economics (Agricultural and Resource Economics 61 or Economics 11);
- two additional courses from anthropology, geography, political science, psychology, sociology; and
- three courses from at least two of the areas: art, classics, music, foreign languages, history, philosophy, religion.

**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, and recreation areas 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 127 semester hours of required and elective courses is required for the Bachelor of Science degree.

	1st SEMESTER	2nd SEMESTER
FRESHMAN YEAR		
English 1	3	-
Communication Elec. <sup>1</sup>	3	3
Quantitative Sciences Elec. <sup>1</sup>	3	3
Geology 1 or Plant and Soil Sci. 161	4	-
Social Science Elec. <sup>2</sup>	3	3
Arts and Humanities Elec. <sup>3</sup>	3	3





Rec. Mgmt. 8	-	3
Physical Ed.	1	1
	1st	2nd
SOPHOMORE YEAR	SEMESTER	
English 50 or 95	3	-
Quant. Science Elec. <sup>1</sup>	-	3
Forestry 3 or 5 or Plant and Soil Sci. 125	3-4	-
Forestry 120	-	4
Econ. 11 or Ag. and Res. Econ. 61	3	-
Econ. 12 or Ag. and Res. Econ. 121	-	3
Arts and Humanities Elec. <sup>3</sup>	-	3
Civil Engineering 12	4	-
Geography 81	-	3
Rec. Mgmt. 138	4	-
SUMMER FIELD TRAINING		
Recreation Mgmt. 150 Rec. Mgmt. <sup>4</sup>	4	
	1st	2nd
JUNIOR YEAR	SEMESTER	
Bus. Admin. 60, Financial Acct.	4	-
Rec. Mgmt. 153, Admin. and Oper.	3	-
Rec. Mgmt. 225, Econ. of Outdoor Rec. & Tour.	-	3
Rec. Mgmt. 235, Outdoor Rec. Plng.	3	-
Bus. Admin. 120, Prin. of Mgmt.	3	-
Concentration Require. <sup>5</sup>	3	6
Electives	-	6
	1st	2nd
SENIOR YEAR	SEMESTER	
Rec. Mgmt. 155, Env. Inter.	3	-
Rec. Mgmt. 157, Ski Area Mgmt.	-	3
Rec. Mgmt. 159, Part. in Rec. Mgmt.	3	-
Rec. Mgmt. 182, Sen. Rec. Sem.	-	2
Rec. Mgmt. 240, Wilderness & Wilderness Mgmt.	-	3
Concentration Require. <sup>5</sup>	3	3
Electives	3	3

Total Program Requirements, Semester Hours 127

<sup>1</sup> All students must complete the following: one course in mathematics, one course in computer science, and one course in statistics.

<sup>2</sup> One course in sociology or psychology and one course in political science.

<sup>3</sup> All students must complete at least three courses in the arts and humanities from art, classics, English, foreign language, history, music, philosophy, religion, or theatre.

<sup>4</sup> An intensive, four-week, field-oriented course immediately following the spring semester.

<sup>5</sup> Students take additional specified course work in either the Public Outdoor Recreation concentration or in the Private Outdoor Recreation and Tourism concentration. Students selecting the Public concentration must complete:

- A course in water;
- A course in wildlife and fisheries biology;
- Forestry 251, Forest Policy and Administration;
- Natural Resources 272, Environmental Impact Assessment;
- One other course in Natural Resources.

Students selecting the Private concentration must complete:

- Rec. Mgmt. 151, Food and Lodging Business Management, or Ag. & Res. Econ. 166, Small Business Management;
- Rec. Mgmt. 158, Resort Management and Marketing;
- Bus. Admin. 17, Business Law, or Business Admin. 132, Legal and Pol. Env. of Business;
- Bus. Admin. 154, Foundations of Marketing;
- One elective course in Business Administration.

Students in the School of Natural Resources may not take more

than 25 percent of their course work in the School of Business Administration.

**RESOURCE ECONOMICS** This program deals with the application of economic theory to natural resource 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 resource management and administration.

	1st SEMESTER	2nd SEMESTER
FRESHMAN YEAR		
Botany 4, Intro. Botany	-	4
Geography 3, Intro. to Economic Geog.	3	-
Math. 19, Calculus I	3	-
Math. 20, Calculus II	-	3
Electives <sup>1</sup>	9	8

	1st SEMESTER	2nd SEMESTER
SOPHOMORE YEAR		
Economics 11, Principles	3	-
Economics 12, Principles	-	3
Statistics	3	-
Geol. I, Intro. Geol.	4	-
Res. Econ. 121, Res. Econ.	-	3
Electives <sup>1</sup>	6	9

	1st SEMESTER	2nd SEMESTER
JUNIOR YEAR		
Civil Engr. 125, Engr. Econ.	3	-
Res. Econ. 222, Nat. Res. Eval.	-	3
Ag. & Res. Ec. 162, Land Econ. Issues	-	3
Geog. 287, Spatial Anal.	3	3
Nat. Res. 244, Quant. Assess. of Nat. Res.	3	3
Econ. 102, Microecon. Theory	3	-
Econ. 101, Macroecon. Theory	-	3
Econ. 268, Econ. of Energy	-	3
Electives <sup>1</sup>	3	2

	1st SEMESTER	2nd SEMESTER
SENIOR YEAR		
Rec. Mgmt. 225, Econ. of Outdoor Rec.	-	3

Forestry 151, For. Econ.	3	-
Nat. Res. 235, Legal Aspects of Planning and Zoning	3	-
Nat. Res. 254, Advanced Nat. Res. Policy	-	3
Nat. Res. 272, Environ. Impact Assessment	-	3
Nat. Res. 102, Water as a Nat. Res.	-	3
Forestry 251, Forest Policy and Admin.	3	-
Electives <sup>1</sup>	6	3

Total Program Requirements, Semester Hours 120

<sup>1</sup> All students must complete the following requirements in communication skills, computer science, social sciences, biological and earth sciences, the arts and humanities, and physical education:

- Speech 11, Effective Speaking; one course from English 1, 50 or 53; and one other course emphasizing communication skills.
- a course in computer science;
- a course in Wildlife and Fisheries Biology;
- three courses selected from art, classics, English and foreign language literature, history, music philosophy, religion and theatre; and
- one course in sociology and one course in political science.
- two hours in physical education activities courses.

**ENVIRONMENTAL STUDIES — N.R.** Two options are available to students interested in an Environmental Studies program with emphasis in natural resources. The Coordinate Major option requires completion of an approved program of studies including the requirements of another major program within the School. The major in Environmental Studies is an individually-designed interdisciplinary program available to qualified students upon approval of a petition to the Director of the Environmental Program. The detailed requirements of these two options are described in the Environmental Program section of this catalogue.

**UNDECIDED — N.R.** High school seniors who do not wish to decide among the various programs of the School may be admitted as "undecideds" and may remain in this category for a maximum of two years. These students and their advisor develop a one- or two-year curriculum which enables them to explore several fields of natural resources. With careful planning and gradual refinement of their interests, undecided students who maintain acceptable academic records can be admitted to one of the School's degree programs and graduate within the usual time required.



# 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/director (see page 34) 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

**101-103 United States 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 in four-year program. One hour.

**201-203 Development of Air Power (1-1)** Air power from balloons and dirigibles through jet age; historical review of air power employment in military and non-military operations supporting national objectives; evolution of air power concepts and doctrine. Leadership lab activities. For 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. Three hours.

# Agricultural and Resource Economics (AREC)

COLLEGE OF AGRICULTURE

*Professors Sargent, Sinclair, Tremblay, Webster (Chairperson); Associate Professors Fife, Gilbert, Pelsue; Assistant Professors Bancroft, Schmidt; Extension Professors Bevins, Houghaboom; Extension Associate Professor Bigalow.*

## PROGRAM IN AGRICULTURAL ECONOMICS

**2 World Food and Population** Agricultural development with emphasis on natural and economic phenomena and the effect of food supplies on population trends and policies. Three hours. Tremblay.

**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. Sargent.

**151 Food and Lodging Business Management** Economic decisionmaking for food and lodging business management. Emphasis on analysis of business investment and profitability over the firm life. Credit not granted for both 151 and 166. Three hours. Bevins.

**161 Agricultural Finance** Capital requirements of agriculture, financial problems of farmers, types and sources of credit, policies and practices of lending institutions. *Prerequisite:* 61 or Economics 12. Three hours. Bancroft.

**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. Sargent.

**166 Small Business Management** Theoretical and practical considerations in organizing and operating small business. Emphasis on financing, accounting, budgeting,

investment analysis, and tax management. Credit not granted for both 151 and 166. *Prerequisite:* Sophomore standing. Three hours. Fife.

**167 Small Business Marketing and Public Relations** Marketing and public relations for the small business manager with special emphasis in recreation and tourism. Three hours. Bevins.

**177 Alternatives for Vermont Agriculture** Economics of producing and marketing alternative commodities on Vermont farms. Analyze resource use, enterprise combinations, credit, taxes, management, and marketing alternatives. *Prerequisites:* 61 or Economics 12. Three hours. Pelsue.

**191, 192 Practicum in Agricultural and Resource Economics** Planned, supervised, off-campus education during academic year or summer. A student may earn up to 12 hours of credit. *Prerequisites:* Junior standing, departmental permission. Credit variable.

**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 with emphasis on resource allocation, production efficiency, and marginal analysis. Field trips required. *Prerequisites:* 61 or Economics 12; junior standing. Three hours. Tremblay, Bancroft.

**205 Rural Communities in Modern Society** (See Sociology 205.)

**207 Markets, Food, and Consumers** Market structure, prices, and economic forces involved in the movement of farm products from producers to consumers. *Prerequisite:* 61 or Economics 12. Three hours. Webster.

**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. Sinclair.

**210 Marketing Institutions** Agricultural marketing institutions servicing northeastern U.S. Reading, lectures, and extended field trip. *Prerequisites:* Six hours in agricultural economics, permission of instructor. Three hours. Webster, Tremblay.

**218 Community Organization and Development** (See Sociology 207.)

**254 Production Economics** Principles and application of the economics of production in agriculture; emphasis on factor use, enterprise selection and combination, decision-making. *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 Agricultural 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; Computer Science 3 and Statistics 111 helpful. Three hours. Pelsue.

**266 Economics of Managerial Decisions** Applying economic concepts to problems of capital budgeting, tax planning, pricing, demand analysis, and discounting cash flows. Cases. *Prerequisite:* Economics 12 or equivalent. Three hours. Fife.

**271 Agriculture in Economic Development** Role of agriculture in development of less-developed countries. Discussion of alternative economic development models. Review of various development programs, including Mexico, China, France, Yugoslavia. *Prerequisite:* 61 or Economics 12. Three hours. Sargent.

**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. *Prerequisite:* 271 or permission. Three hours. Tremblay.

#### PROGRAM IN RESOURCE ECONOMICS

(For descriptions of the following courses, refer to Recreation Management, page 162, and Resource Economics, page 164.)

**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.)

## Anatomy and Neurobiology (ANPS; ANNB)

### COLLEGE OF MEDICINE

*Professors Parsons (Chairperson), Young; Associate Professors Freedman, Kriebel, Krupp, Wells; Assistant Professors Ariano, Boushey, Cornbrooks, Fiekers, Kromer; Lecturer Fonda.*

**9-10 Principles of 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. Physiological laboratories demonstrate function of different organ systems. *Prerequisites:* Limited to students from two-year Allied Health and Nursing programs; 9 for 10. Four hours. Parsons, Alpert.

**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 four-year Nursing students; open to other University undergraduate students. *Prerequisite:* 19 for 20. Four hours. Parsons, Alpert.

**197, 198 Undergraduate Research** Individual laboratory research under the guidance of a 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. Kriebel.

**202 Neuroanatomy and Histology (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

*Professors Atherton, Balch, Bolton, Bull (Chairperson), Carew, Duthie, Foss, Smith, Welch; Associate Professors Murray, Simmons; Assistant Professors Gilmore, Ryan; Extension Professors Gibson, Wadsworth; Extension Assistant Professors Saenger, Wildman; Associate Animal Pathologist Kunkel; Adjunct Professors Randy, Thomas; Adjunct Assistant Professor S. Donnelly; Visiting Assistant Professors C. Donnelly, Levine.*

**1 Introductory Animal Science (3-3)** Fundamental principles of dairy food processing and anatomy, physiology, nutrition, breeding, and management of animal species important in our agricultural economy. Four hours. Bull.

**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 to 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, utilization, and requirements in mammalian species. Three hours. Carew.

**101 Dairy Microbiology (2-3)** Desirable and undesirable activities of microorganisms in foods. Laboratory methods in quality control. Microbial contamination, food spoilage, and food-borne disease. Three hours. C. Donnelly.

**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.

**103 Processing Fresh and Frozen Dairy Foods (3-3)** Principles and processes involved in handling of fluid milk and fluid milk products. Fundamentals of ice cream manufacture; raw material selection, mix formulation, freezing, distribution and marketing. *Prerequisite:* 3. Four hours. Ryan. Alternate years, 1984-85.

**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.

**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. Welch.

**111 Animal Anatomy (3-3)** Dissection of a ruminant animal, demonstrations, gross and microscopic structure of organ systems of the mammalian body with emphasis on

farm animals. *Prerequisite:* A biology course. Four hours. Murray.

**112 Animal Health (3-3)** Fundamentals of disease recognition and prevention in domestic animals. Special disease problems in cattle and horses with emphasis on control measures. *Prerequisite:* 111. 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. Saenger.

**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. Bolton.

**115, 116 Light Horse Production and Management (2-3)** The problems of light horse production. Application of the principles of selection, management, and horsemanship. *Prerequisites:* 115 for 116; junior standing. Three hours. Levine.

**118 Poultry Production (2-3)** Organization and operation of poultry enterprises. Theory and application of feeding, breeding, and management programs and principles. *Prerequisite:* 110. Three hours.

**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.

**197, 198 Undergraduate Research** Research activity under direction of qualified staff member. Findings submitted in written form as prescribed by department. *Prerequisites:* Junior standing, departmental permission. 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. Ryan. Alternate years, 1985-86.

**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. Ryan.

**211 Summer Experience in Farm Management (30 hr/wk)** A work-study program to introduce students to the modern dairy farm as a business. For students who have a strong interest in farm management. *Prerequisites:* Junior, senior, or graduate standing; departmental permission. Four hours. Bull, 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.

**213, 214 Dairy Herd Management (2-3)** Organization and operation of dairy enterprises. Theories and methods of application of feeding, breeding, and management programs and principles. *Prerequisites:* 110; junior standing. Three hours. Gibson, Bull.

**215 Physiology of Reproduction and Lactation (2-3)** Fundamental principles of the physiology of reproduction and lactation with the primary emphasis on farm animals. Three hours. Simmons.

**216 Endocrinology (3-3)** Anatomy, physiology, glandular interrelationships, and assay methods of the endocrine glands and their hormones. *Prerequisite:* Departmental permission. Four hours. Simmons.

**242 Advanced Nutrition** (See Human Nutrition and Foods 242.) Three hours. Tyzbir.

**245 Nutritional Biochemistry** (See Human Nutrition and Foods 245.) Three hours. Tyzbir.

**249 Nutrition Seminar** (See Human Nutrition and Foods 249.) Two hours. Tyzbir.

**281 Animal Sciences Senior Seminar** Reports and discussions of problems and special investigations in selected fields. One hour. Foss, Simmons.

**282 Animal Sciences Graduate Seminar** Reports and discussions of problems and special investigations in selected fields. One to three hours. Foss.

**294 History of Nutrition** (See Human Nutrition and Foods 294.) One hour.

**297, 298 Special Problems in Animal Sciences** Reading, discussion, and special laboratory investigation in the field of animal sciences. *Prerequisite:* Departmental permission. May enroll more than once for maximum of six hours.

## Anthropology (ANTH)

### COLLEGE OF ARTS AND SCIENCES

*Professors Haviland, Mitchell; Associate Professors C. Pastner, S. Pastner, Power, Woolfson (Chairperson); Assistant Professor Gordon; Research Assistant 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.

**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.

**162 Cultures of Africa** Ethnographic survey of representative native societies of sub-Saharan Africa and major colonial/immigrant minorities with emphasis on 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 Franco-Americans** Cultural patterns of the French peoples in New England, with particular reference to Vermont and problems of persistence and change. *Prerequisite:* 21. 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 with emphasis on non-western, non-industrial 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** 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:* 21 or Geography 1 or 16. Three hours. Gade, S. Pastner (team taught). 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.

**193, 194 College Honors**

**195, 196 Special Topics**

**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. 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.

**283 Culture Change** Study of sociocultural transformations in non-western countries with emphasis on 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.

**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** *Prerequisites:* 21, one 100-level course.

## Area and International Studies (AIS)

### COLLEGE OF ARTS AND SCIENCES

*Executive Committee:* Professors Dunlop, Gade, Geno (Director), Miles, Nalibow, S. Pastner, Thompson, Whitebook.

*Asian Studies:* Professors Alnasrawi, Andrews, Davison, Dunlop, Engroff, Gordon, Gussner, Hansen, Little, McKnight, Mitchell, C. Pastner, S. Pastner (Director), Schmidt, Seybolt, Sugarman, VanderMeer, Woodward, Yadav.

*Canadian Studies:* Professors Berkowitz, Clarke, Kenny, Lipke, Mahler, Metcalfe, Miles (Director), Senecal, Stanfield, Thacker, Thompson, Woolfson, Ms. Cleghorn, Miss Crane.

*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, Kinnard, Lewis, Mahoney, Martin, Metcalfe, Moneta, Pacy, Paden, Poger, Richel, Roland, Sandler, Scrase, Spinner, Stephany, Sweterlitsch, Ugalde, Wesseling, Whitebook (Director).

*Latin American Studies:* Professors Gade (Director), Haviland, Johnson, Murad, Simon, True, Ugalde, Vogelmann, Zarate.

*Russian and East European Studies:* Professors Cook, Daniels, Gedeon, Mabry, McReynolds, Meeks, Nalibow (Director), Pacy, Shiman, Staron.

### 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 over-view 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 Special Topics

193, 194 College Honors

195, 196 Special Topics

197, 198 Readings and Research

**295, 296 Seminar** Conducted by team of area specialists covering selected topics through interdisciplinary and comparative approaches. *Prerequisite:* Permission by Executive Committee of Area Studies. Other area courses offered by individual academic departments. For specific requirements for each area, consult director of appropriate program.

## Art (ART)

### COLLEGE OF ARTS AND SCIENCES

*Professors Janson, Zucker (Chairperson); Associate Professors Davison, Fengler, Hewitt, Lipke, Owre, Roland, Woodward; Assistant Professors Chabot, Higgins, Lyman, McIntyre; Instructor Peters; Lecturers Gips, 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 Instruction to Film/Video Production** Basic principles of motion media production, including the physical and electronic phenomena behind the creation of a moving image. Three hours.

**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.

**13 Introduction to Ceramics** Basic design and practice in ceramics. Hand-built and thrown forms, firing and glazing. Three hours.

**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.

**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.

**112 Fine Metals** A more personally designed program with the student planning the major direction of the semes-



ter study. A personal approach to design and drawing emphasized. *Prerequisites:* 11, 111. Three hours. Peters.

**113 Ceramics** Intermediate techniques in throwing and handbuilding. Intensity of investigation varies with individual student. *Prerequisites:* 3, 13. Three hours.

**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.

**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, 134 Printmaking: Lithography** Basic procedures in planographic printing from stone, stressing design and technical competence. Intensity of investigation varies with individual student. May be taken in either order (133 not a prerequisite for 134). *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 individually produce a film/sound project. *Prerequisites:* 4 and either 1, 2, or 3, or permission of instructor. Three hours.

**136 Intermediate Video** Techniques and theories of video production, including a live action studio production, a selective feedback production, and an edited location production. *Prerequisites:* 4 and either 1, 2, or 3, or permission of instructor. Three hours.

**137, 138 Photography** Photographic processes as methods of seeing, with emphasis on 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.

**141, 142 Sculpture** Advanced explorations of manipulative materials. *Prerequisites:* 1, 3. Three hours. Aschenbach or Zucker.

**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.

### 193 College Honors

**195 Special Topics in Studio Art** Offered in day schedule only. *Note:* A Studio Art major may use no more than one Art 195 course to fulfill the minimum Studio Art major requirements of 100-level courses. Three hours.

**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 non-objective source material. *Prerequisite:* 115. Three hours.

**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.

**7 Architecture** Introduction to architecture, its changing form, structure, and purpose from antiquity to the present. Three hours. Janson. Alternate years.

**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.

**85 Introduction to Japanese Art** Architecture, sculpture, painting, prints, and decorative arts and their relationship to Japanese life and thought. Three hours. Woodward.

**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. Alternate years, 1984-85.

**153 Medieval Art to the Year 1000** Painting, sculpture, and architecture from the Early Christian through the Ottonian periods, with emphasis on Byzantine and Carolingian art. *Prerequisite:* 5. Three hours. Roland. Alternate years, 1984-85.

**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, 1984-85.

**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.

**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.

**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. Alternate years, 1985-86.

**167 Baroque Art in Southern Europe** Art of Italy, France, and Spain in 17th century, with emphasis on sculpture.

ture of Bernini, architecture of Versailles, and paintings of Carracci, Caravaggio, LaTour, Poussin, Zurbaran, and Velazquez. *Prerequisite:* 6. Three hours. Roland.

**168 Baroque Art in Northern Europe** Art of the Netherlands, Flanders, and England in 17th century, with emphasis on paintings of Rembrandt, Vermeer, Rubens, and Van Dyck. *Prerequisite:* 6. Three hours. Roland.

**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 1970. *Prerequisite:* 6. Three hours. Lipke.

**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 post-modernism in contemporary art in all media. Coordinated with department's visiting artist 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 1970. *Prerequisite:* 6. Three hours. Lipke.

**184 American Architecture** The Colonial Period to Frank Lloyd Wright. Research on buildings of historical interest in the area. *Prerequisite:* 6. Three hours. Janson.

**186 Monuments of Asia** Buddhist and Hindu temples in India, Southeast Asia, China, and Japan. Each monument discussed in depth. *Prerequisites:* Three hours in Art History or one of the following Asian Studies courses: Geography 58, History 31 or 32, Philosophy 3, or Religion 21. Three hours. Woodward.

**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. Woodward.

**188 Chinese and Japanese Ceramics** Ceramics in East Asia, from the earliest times to the 19th century. *Prerequisite:* Three hours in Art History. Three hours. Woodward.

**194 College Honors**

**196 Special Topics**

**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.

## Biochemistry (BIOC)

### COLLEGE OF MEDICINE

*Professors* Lamden, Meyer, J. Thanassi (Acting Chairperson), Woodworth; *Associate Professors* Auletta, Chiu, Cutroneo, Hart; *Research Associate Professor* Ehrlich; *Research Assistant Professor* N. Thanassi.

**102 Biochemical Analysis (2-4)** Lectures, conferences, and laboratory exercises concerned with theory and techniques of importance in quantitative analysis of biological materials. Primarily for students of Medical Technology; others with permission of department chairperson. *Prerequisite:* Chemistry 3. Four hours. Lamden.

**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.

**211-212 Biochemistry for Health Sciences (2-4)** Primarily for Medical Technology students. Lectures provide a comprehensive study of mammalian biochemistry particularly as it relates to man. Medically-oriented experiments utilizing modern clinical chemistry techniques performed in laboratory. Case studies of MCHV used to correlate lecture and laboratory material. *Prerequisites:* 102 or quantitative chemistry; organic chemistry. Physiology strongly recommended. Four hours per semester. Hart.

## Botany (BOT)

### COLLEGE OF AGRICULTURE

*Professors* Etherton, Hyde, Klein, Vogelmann (Chairperson), Worley; *Associate Professors* Barrington, Cook, Ullrich; *Research Associate Professors* Laing, Morselli; *Research Assistant Professor* Lintilhac; *Lecturer* 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. *Prerequisite:* 1 for 2. 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. Hyde.

### 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</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. Hoffmann.

**101 Genetics** (See Zoology, Biology 101.)

<sup>1</sup>Credit not given for both Biology 1, 2 and Botany 4 or Zoology 9. Credit not given for both Biology 1,2 and Biology 3. Botany and Zoology majors will not receive credit for Biology 3.

**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 with emphasis on morphology and geography. Discussion of pertinent literature on phytochemistry, genetics, and ecology. *Prerequisite:* 4 or Biology 1, 2. Four hours. Cook.

**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.

**132 Elementary Genetics (3-1)** Introduction to the genetics of eucaryotes as applied to plant and animal breeding, systematics, and genetic engineering applied to agriculture. *Prerequisite:* 4 or Biology 1, 2 or Zoology 9; a semester of college chemistry and either math. or statistics. Four hours. Hyde.

**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, 1984-85.

**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 General Ecology (2-3)** Theory and principles of organism-environment interactions; analysis of landscape and ecosystem structure and function; comparison of natural and disturbed systems; experimental design; field trips. *Prerequisite:* 4 or Biology 2. Three hours.

**162 General Ecology Laboratory (0-3)** Field work and experiments to illustrate concepts presented in Botany 160. *Prerequisite:* Previous or concurrent enrollment in 160. One hour.

**193, 194 College Honors (For Arts and Sciences students.)**

**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, 1984-85.

**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, 1985-86.

**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, 1985-86.

**241 Tropical Plant Systematics** Diversity of tropical flowering plant communities; recent systematic and evolutionary angiosperm research; anatomy, morphology, ecology, and geography of major families. Student presentations on recent research. *Prerequisite:* 109. Three hours. Barrington. Alternate years, 1984-85.

**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. (Not offered 1984-85.)

**252 Molecular Genetics II: Regulation of Gene Expression in Eukaryotes** Processing of information present in nucleic acids; knowledge generated from recombinant DNA techniques applied to higher cells; control in transposition, transformation, transcription, and processing transcript. *Prerequisites:* 132, or Biology 101 or Biochemistry 301, or equivalents; Medical Microbiology 211 preferred; permission of instructor. Three hours. Ullrich.

**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 15, 16. Four hours. Etherton. Alternate years, 1985-86.

**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 Grinnell, Laber, Severance, Thimm (Director); Associate Professors Anderson, Gatti, Kraushaar, Michael, Parke, Shirland, Tashman; Assistant Professors Battelle, Cats-Baril, Gurdon, Hummel, Jesse, Sinkula, Woodman; Lecturers Burak, McCormick, McCarren.*

## BUSINESS ENVIRONMENT AND GENERAL BUSINESS

**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. 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. *Prerequisite:* Economics 12. 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:* Economics 12. Three hours. (Not offered 1984-85.)

**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:* Senior standing. Three hours.

**195, 196 Special Topics** Specialized or experimental courses offered as resources permit. Fall 1984, Logistics Management. *Prerequisite:* 154. Three hours.

**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.

## ACCOUNTING

**60 Financial Accounting (3-2)** 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 (3-2)** Introduction to use of accounting for planning, cost behavior and control, and decision making. *Prerequisite:* 60. Four 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; 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. *Prerequisite:* 60. Three hours.

**168 Cost Accounting** Accounting for inventory valuation and income determination, non-routine decisions, policy-making and long-range planning. *Prerequisite:* 61. Three hours.

**265 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. (Not offered for graduate credit.)

**266 Advanced Accounting** Accounting for partnerships, special sales contracts, parent-subsidiary relationships, fiduciary relationships, and governmental units. *Prerequisite:* 162. Three hours. (Not offered for graduate credit.)

**267 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:* 266. Three hours. (Not offered for graduate credit.)

## 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 Commercial Bank Management** Problems facing bank managers examined and solution techniques developed. Specific topics include asset selection, liability management, bank accounting systems, and the regulatory system. *Prerequisite:* 184. 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. *Prerequisites:* 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 conflict and cooperation between employers and unions. Topics include the importance of ideology, the causes of strikes and other forms of industrial conflict, the union contract, and techniques for resolving conflict. *Prerequisite:* 120. Three hours.

**126 Current Issues in Management and Organizational Theory** One and two credit seminars. Subjects include performance appraisal, career dynamics, training and development, selection and recruitment, and affirmative action. *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. *Prerequisite:* Computer Science 11. Three hours.

**142 Structured Business Programming — COBOL** Fundamental principles of business computer program-

ming. 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, etc., used. *Prerequisite:* 142. 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. *Prerequisite:* 142. 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. *Prerequisite:* 143, 144. 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: 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 data collection methodology. *Prerequisites:* 154, Statistics 141. 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 ANALYSIS

**172 Managerial Economics** Application of the logic economic theory and the power of mathematical programming and statistics to the operation of the firm. *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, inventories, sequencing, 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.

**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:* Math. 20 or equivalent. 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.

**270 Applied Regression Analysis** (Same as Statistics 225.) Nature and applications of basic regression-correlation models in investigating relationships, testing hypotheses, and making predictions. Emphasis on developing appropriate models and evaluating existing research. *Prerequisites:* Any one of Statistics 111, 141, 211, 241, or 261; Economics 11, Math. 19 or equivalent. No credit for graduate students in Statistics or Biostatistics. Three hours.

**272 Discrete Simulation** (Same as Civil Engineering 227.) 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.

**274 Safety Engineering (2-0)** (Same as Mechanical Engineering 152.)

**275 Human Factors (2-3)** (Same as Mechanical Engineering 175.)

**276 Plant Planning (3-3)** (Same as Mechanical Engineering 176.)

**277 Seminar in System Dynamics** (Same as Technology 201.)

## Chemistry (CHEM)

### COLLEGE OF ARTS AND SCIENCES

*Professors Allen, Bushweller (Chairperson), Flanagan, Geiger, Krapcho, Kuehne, Strauss, White, Wulff; Associate Professor Weltin; Assistant Professors Carrano, Goldberg, Leenstra.*

*Note: Credit cannot be given for: 1 and also 3 or 5 or 11 or 13; 3 and also 5 or 11 or 13; 5 and also 11 or 13; 2 and also 12 or 14; 4 and also 42; 14 and also 121; 42 and also 141; 141, 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.

**7 Earth, Air, Fire, and Water** Introductory course for non-science majors which deals with man's understanding of his 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 for 12. Three hours.

**13, 14 General Chemistry 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.

**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 premedical, pre dental, and preveterinary 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.

**201 Advanced Chemistry Laboratory (2-6)** Lectures emphasize analytical instrumentation (spectroscopic instru-

mentation, electrochemistry, electronics, chromatography). Laboratory problems require modern analytical, physical, and synthetic techniques as applied primarily to inorganic systems. *Prerequisites:* 146, credit for or concurrent enrollment in 162 or 163. Four hours.

**202 Advanced Chemistry Laboratory (1-8)** Laboratory and discussion only. Problems require modern analytical, physical, and synthetic techniques. *Prerequisites:* 146, credit for or concurrent enrollment in 162 or 163. *Note:* Although it is highly recommended that 201 be taken before 202, in special cases this may not be necessary. Four 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 Advanced Analytical Chemistry** Systematic survey of modern methods of chemical analysis. Principles and applications of analytical and molecular spectroscopy, electrochemistry, and separation techniques. *Prerequisites:* 162, 163. Three hours. Geiger, Goldberg.

**222 Electroanalytical Chemistry** Principles of modern electrochemical analysis focusing mainly on finite current methods — voltammetry, polarography, chronoamperometry, cyclic voltammetry, etc. Introduction to modern operational amplifier instrumentation. Double layer theory and electron transfer kinetics. *Prerequisite:* 163. Three hours. Geiger, Goldberg. Alternate years.

**224 Chemical Separations** Theory and practice of chromatographic separations. Emphasis on gas-liquid, liquid-liquid, and liquid-solid chromatography. *Prerequisite:* 221. Two hours. Geiger, Goldberg. Alternate years.

**227, 228 Special Topics in Analytical Chemistry** Selected topics of current interest in area of 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, Carrano.

**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, Carrano.

**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. 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. 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 multi-step 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, 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, bio-organic 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.

**285, 286 Special Topics** Selected topics of an interdisciplinary nature, designed particularly for advanced undergraduate chemistry majors. Possible subjects include environmental chemistry, chemical technology, chemical economics. Offered as occasions arise. Variable credit.

**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.

## Civil Engineering (CE)

### COLLEGE OF ENGINEERING AND MATHEMATICS

*Professors Cassell, Dawson, Oppenlander; Associate Professors Downer, Fay, Hemenway, 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 Geomtronics (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 Civil Engineering. *Prerequisites:* Math. 2 and/or equivalent. Four hours.

**100 Mechanics of Materials I (3-0)** The behavior of materials; normal and shearing stresses; deflections; applications to statically indeterminate members; analysis of plane stress and strain. *Prerequisite:* 1. 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 alternatives 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. Dawson, 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.

**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, groundwater, 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. 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. 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. *Corequisite:* 171. Three hours. Dunham.

**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.

**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 a special topic under the guidance of a faculty member. Library investigations, unique design problems, laboratory and field studies. *Prerequisites:* Senior standing, departmental permission. Three hours.

**195 Special Topics**

**210 Airphoto Interpretation (2-3)** Techniques in aerial photographic interpretation; principles of stereoscopic viewing and identification of airphoto features related to

landform, vegetation, drainage, soil color/tone, 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)** Transportation 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.

**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.

**251 Environmental Facilities Design-Wastewater (2-3)** Design of wastewater conveyance and treatment facilities; sewage treatment plant design; equipment selection. *Prerequisite:* 151. Three hours.

**252 Industrial Hygiene (3-2)** Industrial hygiene problems; effects of pollutants on health; threshold limit values; emphasis on the engineering evaluation of hazard and con-



trol 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.

**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.

**257 Analysis of Aquatic Systems (3-0)** Quantitative study of biological, chemical, and physical phenomena in lakes, streams, estuaries, and groundwater; 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 groundwater; 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 Groundwater Hydrology (3-0)** Principles of groundwater hydraulics, well characteristics, aquifers, and use of numerical methods to solve groundwater 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. 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, physio-chemical concepts, plasticity properties, permeability, and compaction. *Prerequisite:* 180. Three hours. Olson.

**295 Special Topics** (Not offered for graduate credit.)

## Classics (CLAS)

### COLLEGE OF ARTS AND SCIENCES

*Professors Ambrose (Chairperson), Davison, Gilleland, Schlunk; Assistant 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.

**1-2 Elementary Greek** Four hours. B. Rodgers.

**11, 12 Intermediate Greek** Review of syntax. Readings from Plato, Herodotus, Euripides, and Homer. Three hours. Davison, Schlunk.

**111, 112 Prose Composition** Required of students who concentrate in Greek. 111: one hour. 112: two hours. B. Rodgers.

**193, 194 College Honors**

**195, 196 Special Topics**

**197, 198 Readings and Research**

**201 Greek Orators** Three hours. B. Rodgers. Alternate years, 1985-86.

**202 Greek Comedy** Three hours. Ambrose. Alternate years, 1984-85.

**203 Greek Historians** Three hours. Davison. Alternate years, on demand.

**204 Greek Tragedy** Three hours. Ambrose. Alternate years, 1984-85.

**205 Greek Philosophers** Three hours. B. Rodgers. Alternate years, on demand.

**206 Greek Epic** Three hours. Schlunk. Alternate years, on demand.

#### LATIN (LAT)

There are no prerequisites to any Latin course. Students who have had two years of high school Latin normally enroll in Latin 9 or Latin 12. 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.

**1, 2 Elementary Latin** For students who present less than two years of high school Latin. Four hours. Gilleland.

**9 Basic Latin Grammar Review** Extensive review of Latin syntax. Selections from prose writers. Three hours. Davison, Gilleland.

**12 Intermediate Latin** Selections from Vergil and Ovid. Three hours. Schlunk, Gilleland.

101, 102 **Survey of Latin Literature** Selections from principal Roman authors. Three hours. Gilleland, Schlunk.

111, 112 **Latin Prose Composition** Required of students who major in Latin and of those who wish to be recommended to teach Latin. 111: one hour. 112: two hours. B. Rodgers.

193, 194 **College Honors**

195, 196 **Special Topics**

197, 198 **Readings and Research**

203 **Republican Prose** Three hours. B. Rodgers.

204 **Epic Poets** Three hours. Schlunk.

227 **Roman Lyric Poets** Three hours. Alternate years, on demand.

251 **Roman Letters** Three hours. B. Rodgers. 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.

*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.

**Classics 153 Greek Drama** Three hours. Alternate years, 1984-85.

**Classics 154 Greek Historians** Three hours. B. Rodgers. Alternate years, on demand.

**Classics 155 Ancient Epic** Three hours. Davison. 1984-85.

**Classics 156 Greek and Roman Satiric Spirit** Three hours. Alternate years, on demand.

\*This course may be used towards the distribution requirement of the College of Arts and Sciences in category A as part of the non-foreign language courses.

\*\*This course may be used toward the distribution requirements of the College of Arts and Sciences in either category A or B.

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

*Professor Wilson; Associate Professor Guitart; Assistant Professors Hoffman, Kramer; Lecturers Baker, Houghton, Turnbaugh.*

10 **Voice and Articulation** Principles of pronunciation, phonetic practice for the improvement of voice and diction in communication. Three hours.

20 **Introduction to Disordered Communication** General survey of the disorders of communication. Three hours.

80 **Introduction to Speech and Hearing Sciences** Introductory survey of the physics and biology of verbal communication (required for CS&D majors). Three hours.

90 **Phonetics** Physiology and acoustics of English speech as related to the transcription of normal and disordered speech. Three hours.

101 **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. Hoffman.

102 **Audiological Acoustics** Measurement, production, and reproduction of sound, with emphasis on the processes of human hearing. *Prerequisites:* 80, 90. Three hours. Kramer.

103 **Physiology of Hearing** Anatomy and physiology of the normal auditory system. Basic acoustics and subjective correlates of the auditory stimulus. *Prerequisites:* 80, 90. Three hours.

104 **Development of Spoken Language** Speech and language acquisition interpreted in light of current learning theory, linguistic theory, and methods of linguistic analysis. *Prerequisites:* Nine hours of CS&D and psychology including 80, 90. Three hours. Wilson.

193, 194 **College Honors**

195, 196 **Special Topics**

251 **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:* 104. Four hours.

261 **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 **Measurement and Management of Communication Disorders** Study of the construction, application, interpretation, and implementation of tests of communicative functioning. *Prerequisite:* 251. Three hours. Hoffman.

271 **Audiological Assessment** Examination of basic parameters in measurement of hearing. Pure tone testing, masking, impedance, and speech evaluations. *Prerequisite:* 103 or permission of instructor. Three hours. Kramer.

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 104, 271. Three hours. Houghton.

281 **Neuroanatomical Basis of Speech and Hearing** The neuroanatomical structures which underlie the formula-

tion, 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:* 104. 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. Guitar. (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.

## Computer Science (CS)

### COLLEGE OF ENGINEERING AND MATHEMATICS

*Professors Absher, Dawson, Williams; Associate Professor Hegner; Assistant Professors Hartley, Margolis, Train; Lecturers Charbonneau, Heinrich, Hill, Whitmore.*

**3 Computers and Their Application (2-2)** Introduction to computer systems, components, system software, editors, utilities and language processors, programming, problem-solving, applications. Non-major credit. *Prerequisite:* Two years high school algebra. Three hours. Heinrich.

**11 Computer Programming I (2-2)** Structure of a digital computer. Development of algorithms for problem solution. Expression of algorithms using flowcharting techniques. Implementation of algorithms utilizing a higher level language. *Prerequisite:* Credit in Math. 19, or concurrent enrollment or credit in Math. 21. Three hours. Hill.

**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. Dawson, Hill.

**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. Dawson, Hill.

**102 Software Fundamentals (3-0)** An overview of design, concepts associated with assemblers, loaders, compilers, and operating systems. *Prerequisite:* 101. Three hours. Hill, Heinrich.

**103 Programming Languages (3-0)** Formal definition of programming languages including specification of syntax and semantics. Global properties of algorithmic languages including scope of declarations, storage allocations, binding time of constituents and recursive procedures. List processing and string manipulation languages. Precision of arithmetic operations and run time representation of data structures. *Prerequisite:* 102. Three hours. Heinrich.

**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.

**195 Special Topics** *Prerequisite:* Consent of instructor. Hours variable.

**200 Discrete Simulation (3-0)** (See Civil Engineering 227.) No CS graduate credit.

**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. Hartley, Train.

**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. Multi-tasking and parallelism. Object-oriented and applicative languages. Introduction to translator design. *Prerequisite:* 104. Three hours. Hegner, Margolis, Hartley, Train.

**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. Hartley, Train.

**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 non-commuting variable, application to parsing. *Prerequisite:* Math. 104. CS 243 highly recommended. Three hours. Margolis.

**224 Analysis of Algorithms (3-0)** (Same as Math. 224.)

**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. Margolis, Hegner.

**295 Special Topics in Computer Science (3-0)** Lectures, reports, and 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, J. McKechnie, Preston, Taoka, Venmar; Lecturers Hamidiani, Lamoray, Mercier, Podruch, Rowell, Welsh.*

**3 Dental Hygiene Core I** Introduction to the morphology and physiology of the oral tissues and to the practice of dental hygiene emphasizing patient education and preventive procedures. Seven hours. Wootton, Hamidiani.

**4 Dental Hygiene Core II** Continuation of Dental Hygiene 3 including in-depth study of head and neck anatomy and the development of clinical skills. Five hours. Hamidiani, Wootton.

**61 Radiology** Study, demonstration, and practice of fundamentals of intraoral radiographic technique including electrophysics; angulation of the machine; placement and complete processing of films. Two hours.

**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. Long.

**71 Myofunctional Therapy** Discussion designed to provide an understanding of the etiology and symptomatology of oral pressure habits which affect occlusion, mastication, deglutition, facial expression, and speech. One hour.

**91 Dental Materials** Study of the materials used routinely in dental practice. Two hours. Lamoray.

**145 Dental Hygiene Senior Major** Introduction to general pathology, oral pathology, periodontics. Five hours. Hill.

**146 Dental Hygiene Senior Major** Continuation of Dental Hygiene 145 including pharmacology and anesthesia in dental practice. Two hours. Farnham, Mercier.

**181-182 Senior Clinic and Seminar** Clinical practice with patients from simple to more difficult cases both children and adults. Field practice at local dental clinics, hospitals, and private institutions. *Prerequisites:* 3, 4. Four hours.

## Economics (ECON)

### COLLEGE OF ARTS AND SCIENCES

*Professors Alnasrawi, Campagna, Chase (Chairperson), Nadwojny; Associate Professor Bates; Assistant Professors Elfner, Gaspari, Woolf, Gedeon.*

**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 non-majors. 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. *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.

*For the following 100-level courses, Economics 101 and 102 are either pre- or corequisite as noted.*

**111 Money and Banking** Commercial and central banking with special attention given to the Federal Reserve system, monetary theory and policy. *Pre- or corequisite:* 101. Three hours.

**116 Public Finance** 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. *Pre- or corequisite:* 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. *Pre- or corequisite:* 102. Three hours.

**130 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. *Pre- or corequisite:* 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. *Pre- or corequisite:* 101 or 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. *Pre- or corequisite:* 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. *Pre- or corequisite:* 101 or 102.

**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. *Pre- or corequisite:* 101 or 102. Three hours.

**193, 194 College Honors**

**195, 196 Special Topics**

*All 200-level courses have minimum prerequisites of 100, 101, and 102. 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, with emphasis on antitrust laws and decisions and federal regulatory programs. Three hours.

**241 Human Resources** The theory and policy of the labor sector and of human capital in an advanced economy. *Prerequisite:* 141. Three hours.

**242 Labor-Management Relations** Economic influences of unionization. The grievance process, arbitration, and labor relations laws. *Prerequisite:* 141. Three hours.

**255 Economic Development** Theories of economic growth applied to developing countries of the contemporary world including the political and social determinants of economic progress. 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.

**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.

**270 Economic History of the United States I** Economic development and the evolution of capitalism in the U.S. from the origins and growth of the economy to 1900. Three hours.

**271 Economic History of the United States II** The American economy in the 20th century with particular emphasis on industry studies. 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.

**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.

**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.

**296 Seminar and Special Topics**

**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, Boller, Carlson, Clements, Conrad, Coward, Ducharme, Fox, Gobin, Grams, Hanley, Hunt, Leggett, McKenzie, Nash, Peterson, Ripa, Shiman, Tesconi; Associate Professors Barbour, Burrell, Christensen, Erb, Fitzgerald, Goldhaber, Griffin, Hasazi, Holmes, Johnston, Lang, Larson, Letteri, Meyers, Nevin, B. Nichols, Paolucci-Whitcomb, Pierce, Ponzio, Rathbone, E. Rathbone-McCuan, Sandoval, Shelton, Thompson, Williams, Young; Assistant Professors Bright, Bryant, Chase, Cheney, Clarke, DeWeaver, Dunkley, Greig, Hood, Jameson, Lambert, McEntee, O'Donnell, Roberts, Rose, Smith, Stevenson; Lecturers Burdett, Geller, Watson, Wheeler, Wood; 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 underclassmen. 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 Coordinator of Professional Laboratory Experiences. 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-CES 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.

**62 Life Planning** Introduction to self, career, and academic resource awareness geared to students who want to assess their own values systems, decision-making processes, and life goals. Three hours.

**193 Environmental Education** Philosophy, concepts, and teaching-learning strategies of environmental educa-

tion. *Prerequisite:* Three hours in education or permission of instructor.

**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.

### 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. Special attention to 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 the 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** A cross-cultural examination of education and selected social services in several countries, e.g. China, U.S.S.R., England. Ideology, social class, and social change are some of the themes to be explored. *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, 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 Experience Analysis of American Primary Schools** Designed for students enrolled in the American Primary Program. 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, sophomore 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. 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, sophomore 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 Primary School Teachers** On-site psychological and instructional support to American Primary Experience Program interns during student teaching experience. Weekly meetings and personal conferences centering around difficulties and successes of student teaching held in the various field sites. *Prerequisites:* Acceptance in APEX, 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.

**242 Modern Trends in Elementary Education** Study of modern educational principles and practices in today's elementary schools. Emphasis on communication in classroom, interaction between students and teachers, materials, emerging trends. Different teaching modes that assist in development of more critical analysis of the teaching act. *Prerequisite:* Twelve hours in education and related areas. 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 pre-school 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.

**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. *Prerequisites:* Satisfactory completion of 145 and 146, 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.

## 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 non-majors 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 and 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. 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. 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

**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. Jameson, Shelton, Goldhaber.

**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.

**69 Freshman Program Seminar** First half of two-year program in which advisor and students meet to discuss contemporary issues in human development and early childhood. Students may enroll twice in this course. Two hours.

**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. Jameson.

**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. Jameson.

**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. Grams.

**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.

**169 Sophomore Program Seminar** An ongoing seminar for Human Development majors. Readings, study, and discussion of current issues, research, publications, and professional affairs. *Prerequisites:* Sophomore standing, Early Childhood and Human Development major. A student may enroll twice in this course. Two hours.

**184 Early Childhood Programs** An active examination of present day early childhood programs in relationship to their historical development from early history. Three hours.

**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 with readings and research, advanced child development seminar, and curriculum workshop. *Prerequisite:* Permission. Fifteen hours.

**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.

**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.

**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

**16 Driver Education Workshop, Basic** A mandatory teacher preparation course to teach driver education in Vermont secondary schools. The first of two courses that must be completed. Three hours.

**18 Driver Education, Advanced** Extensive course in driver and traffic safety for teachers in driver education. Deals with problems experienced by teachers in driver education and highway safety involving driving practice, introduction to range operations, and simulations. *Prerequisite:* 16. Three hours.

**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.

**22 First Aid and Safety** To prepare students with the first aid knowledge and skills necessary to care for most injuries and to meet most emergencies. Red Cross certification for successful performance in Standard First Aid and Personal Safety. One hour.

**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 Lifesaving Certificate. Two hours.

**30 Career Planning in H.P.E.R.** Study of alternatives, issues, and skills related to career options for students majoring in Health, Physical Education, and Recreation. Special emphasis on factors pertaining to preparation, locating, and application for employment. One and one-half hours, half semester.

**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, etc. *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 Tract** 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 Aquatics** Analysis and practice of skills, techniques, and knowledge involved in coaching aquatics. *Prerequisites:* Skill competency in aquatics, 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.

**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** Study of joint articulation, muscular action, and basic principles of body mechanics as foundation for analysis of motor performance in physical education activities, athletics, and physical therapy. *Prerequisite:* One year biological science. Three hours.

**167 Physiology of Muscular Activity** Study of physical exercise upon circulatory, respiratory, digestive, and nervous system. Relationship of endurance, fatigue, training, and nutrition to efficiency of physical performance. *Prerequisite:* One year biological science. 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 sub-disciplines 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.

**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.

**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 interrelationships 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 Health Education** 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.

**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.

#### 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 with emphasis on 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 with emphasis on 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 multi-handicaps. *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 multi-handicaps. *Prerequisite:* Permission of instructor. Credit as arranged.

#### ADMINISTRATION AND PLANNING — EDAP

**185 Future Cognition** A survivable future will require development of expanded cognitive and affective abilities, consensus on values, new behaviors and skills. Alternative futures examined to determine implications for these abilities and for current educational processes. Students develop scenarios of alternative future. Three hours.

**264 Evaluation in Education and Social Services** To acquaint educational and social service personnel with overview of state-of-the-art of 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

**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 Personality Development** 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.

**283 Group Dynamics: Theory and Experience** Encounter group experience for prospective counselors geared to provide them with increased awareness of self and of their 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.

**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.

#### PHYSICAL EDUCATION ACTIVITIES — 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 33.) 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.

tion. Classes are coeducational unless indicated for men or women only.

Advanced Life Saving	Officiating Basketball
Archery	Ski Instructors
Badminton	Skin and Scuba Diving
Basketball	Soccer
Conditioning	Soccer-Speedball
Cross Country Skiing	Social Dance
Diving	Softball
Fencing	Square Dance
Field Hockey	Squash
Field Hockey	Stretch & Relaxation
Officiating	Swimming
Fitness Assessment	Synchronized Swim
Flag Football	Tennis
Folk Dance	Track and Field
Golf	Trampoline
Gymnastics	Umpiring Softball
Handball	Volleyball
Ice Hockey	Weight Reduction
Judging Women's Gym	YMCA Lifeguard
Lacrosse	Certification
Modern Dance	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	Judo
Bowling	Karate, Korean, Okinawan
Downhill Skiing	Modern Jazz
Horseback Riding	Sailing
Ice Skating	

The following activities, co-offered by the Physical Education and ROTC Departments, may be counted toward the physical education requirements:

Back Packing	Wilderness Survival
Marksmanship	Physical Training (by
Orienteering	special permission of
Rappelling	ROTC)

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 knowledge, 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 (Chairperson), Lai, Lambert, Mirchandani, Roth, Rush, Williams; Associate Professor Bowman; Assistant Professor Titcomb; Adjunct Professor Rideout.

### 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. Mirchandani.

**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. Mirchandani.

**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. Rush.

**100 Electrical Engineering Concepts I (3-3)** Introduction to electrical measurements and circuits; both analog and digital, emphasizing applications. Restricted to non-majors. *Prerequisite:* Physics 16 or 125. Evering.

**101 Electrical Engineering Concepts II (3-3)** Introduction to microprocessors; energy conversion and transmission. Restricted to non-majors. *Prerequisite:* 100. Four hours. Evering.

**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. Absher.

**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. Roth, Evering.

**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. Roth, Evering.

**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. Williams.

**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. Williams.

**122 Electronics III (3-0)** Analysis of pulse and digital circuits. Design of transistor logic gates, multivibrators, and blocking oscillators. *Prerequisite:* 121. Three hours. Williams.

**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. Lai, Absher.

**134 Fundamentals of Mini/Microcomputer Based Systems (3-2)** Introduction to digital computers. Hardware and software structure. Techniques of interfacing. *Prerequisite:* Computer Science 11. Four hours. Williams.

**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. Rush, Evering.

**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. Electromechanical transducers. Thermal waves. Diffusion process. *Prerequisite:* 141. Three hours. Roth.

**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 16 or 128. Three hours. Titcomb.

**164 Solid State Physical Electronics II (3-0)** Physical 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. Titcomb.

**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. Lai, Roth.

**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. Roth, Lai.

**195 Special Topics.** *Prerequisite:* Departmental permission. Variable credit.

#### LABORATORIES

**81 Sophomore Laboratory (1-3)** Direct current measurements, nonlinear resistive elements, the cathode ray oscilloscope, transients in RC circuits, alternating current measurements, sinusoidal behavior of RL and RC circuits, transients and sinusoidal behavior of RLC circuits. Two hours.

**82 Sophomore Laboratory (1-3)** Alternating current bridges, resonant harmonic analyzer, measurement of charge, current, voltage, power, resistance, capacitance, inductance, and time. *Prerequisite:* 81. Two hours.

**183 Junior Laboratory (1-3)** A-C and D-C machines. Active device and basic amplifier characteristics. *Prerequisite:* 82. Two hours.

**184 Junior Laboratory (1-3)** Amplifiers, A-D and D-A conversion, control systems, microwaves, and electromagnetic waves on lines. *Prerequisite:* 183. Two hours.

**185 Senior Laboratory (0-3)** Electrical conductivity in solids, the Hall effect, properties of gaseous conductors and dielectric materials. Control systems. Electromechanical transducers. *Prerequisite:* 184. One hour.

**186 Senior Laboratory (0-3)** Design and construction of pulse and digital circuits including logic gates, astable multivibrators, bistable multivibrators, monostable multivibrators, and blocking oscillators. *Prerequisite:* 185. One hour.

**187 Senior Project** Experimental or theoretical project selected by the student and conducted under staff supervision. Variable credit.

#### 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 Electrical Engineering or permission of instructor. Three hours. Mirchandani.

**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. Mirchandani.

**209 Transient Phenomena (3-0)** Study of complex variable basis of Laplace and Fourier Transforms; applications to transient behavior of lumped and distributed parameter systems, root locus. Nyquist criterion and two-dimensional field problems. *Prerequisite:* 4. Three hours. Rush.

**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 Electrical Engineering. *Prerequisites:* College physics, calculus or permission of instructor. Four 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. Absher, Lai.

**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. Williams.

**237 Digital Computer Logic, Circuits and Systems (3-0)** Logical design digital computers. Boolean algebra as aid to circuit design. Circuits and components for transmission, storage, and modification of information and their combination into arithmetic units, memory devices, program controls, and microprocessors. *Prerequisite:* Graduate standing or departmental permission. Three hours. Absher.

**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. Rush.

**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. Rush, Evering.

**244 Radar Systems Engineering (3-0)** Radar theory including antennas, propagation, signal detection, and parameter estimation. Applications including search and track radars, aircraft control and landing, radio/radar astronomy, and modern phased array radars. *Prerequisite:* 174 or departmental permission. 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. Anderson, Titcomb.

**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. Anderson, Titcomb.

**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. Anderson.

**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. Lai.

**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. Lai.

**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 Analog Signal Processing and Filtering (3-0)** Introductory filter concepts. Approximation techniques. Filter realizations. Design of practical filters. Switched capacitor filters. A/D and D/A converters. Processing and filtering of real-world signals. *Prerequisites:* 201 or 171, 172 or equivalent. Three hours. Lai, Mirchandani.

**276 Digital Signal Processing and Filtering (3-0)** Intro-

ductory digital signal concepts. Structure of digital filters. Design of digital filters. Use of FFT in signal processing and filtering. Hardware implementation. Applications to signal processing and filtering. *Prerequisite:* 275. Three hours. Lai, Mirchandani.

**277 Advanced Topics in Digital Signal Processing and Filtering (3-0)** Approximation methods in design of digital filters. Effect of finite word length. Two-dimensional signal sampling, transforms and digital filters. Hardware implementation. Application in signal processing. *Prerequisite:* 276. Three hours. Lai, Mirchandani.

**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. Roth.

**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, Howe, Huddle, Jones, Long, Manchel, Orth, Poger, Rosa, Rothwell, Shepherd; Associate Professors A. I. Dickerson, Edwards, Fulwiler, Gutman, Hall, Stanton, Stephany, Thompson; Assistant Professors Biddle, Magistrale, Simone, Sweterlitsch, Warhol; Lecturers M. J. Dickerson, Kohler.*

*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.

*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 which will include 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.

**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 down 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.

**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. Clark, Eschholz, Rosa, Sweterlitsch. (Not offered 1984-85.)

*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 Utopian and Anti-Utopian Fiction** Themes and literary characteristics of selected English and American utopias and dystopias from the Renaissance to the present. (Not offered 1984-85.)

**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, Edwards.

**50 Expository Writing** Writing and analysis of expository (non-fiction) essays. *Prerequisite:* Sophomore standing. Biddle, Eschholz, Howe, Jones, Kohler, Rothwell, Sweterlitsch.

**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 (preference in enrollment given to sophomores). Broughton, M. J. Dickerson, Edwards, Huddle.

**62 Bible as Literature** Jewish and Christian scripture analyzed as literary documents. Stephany.

**65 Introduction to Folklore** Basic concepts of folklore—development of the discipline; survey of 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 Special Topics**

*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, 1984-85.

**105 Technique and Criticism of Poetry** Intensive analysis of various kinds of poetry to develop appropriate critical methods and standards. (Not offered 1984-85.)

**106 Introduction to Critical Approaches** A survey of

major critical approaches, emphasizing both critical problems and specific critical attitudes toward literary works. (Not offered 1984-85.)

**110 Old English** The sounds, words, and structure of Old English; simple prose texts and selections from *Beowulf*. A. I. Dickerson. Alternate years, 1985-86.

**111 Chaucer** Study of the principal works of Chaucer, emphasizing Chaucer's literary scope, talents, and position in medieval literature. A. I. Dickerson, Stephany. (Not offered 1984-85.)

**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, Stephany. Alternate years, 1984-85.

**113 Medieval and Renaissance Drama** From drama as religious ritual to the highly sophisticated plays of Shakespeare's contemporaries and the early 17th century. Howe, Rothwell. (Not offered 1984-85.)

**114 Elizabethan Prose and Poetry** Poetry of Spenser, Donne, and Jonson — their predecessors, contemporaries, and followers; development of prose from ornateness towards simplicity. Long. Alternate years, 1984-85.

**115, 116 Shakespeare** Howe, Rothwell, Simone.

**118 Milton** *Paradise Lost*, *Paradise Regained*, *Samson Agonistes*, some minor poems, and selected prose works.

**121 Restoration and 18th Century Prose, Poetry, and Drama** Significant writers and dramatists from Dryden to Sheridan and Johnson. Stanton. Alternate years, 1985-86.

**123 18th Century English Novel** English fiction from its origin through the 18th century. Hall, Stanton.

**124 19th Century English Novel** English fiction of the 19th century. Hall, Stanton.

**125 Romantic Period I** Development of the Romantic Movement through Wordsworth and Coleridge. Jones.

**126 Romantic Period II** Development of the Romantic Movement through Byron, Shelley, Keats, and other Romantic poets and prose writers. Jones.

**127 Victorian Literature** Significant writers, exclusive of novelists, from 1832 to 1900. Long. Alternate years, 1985-86.

**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, Stanton. (Not offered 1984-85.)

**134 Modern Irish Literature** Irish literature from 1890 to the present, with emphasis on Joyce and Yeats. Bradley.

**135 Canadian Literature** The development of a national literature. Required of students in the Canadian Area Studies Program. Thompson. (Not offered 1984-85.)

**136 Contemporary Canadian Literature.** Thompson. (Not offered 1984-85.)

**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, Poger.

**141 19th Century American Novel** The flowering of the novel in the United States. Hawthorne, Melville, Twain, Howells, James, and others. Biddle, Cochran, Eschholz, Shepherd.

**144 American Poetry to World War I** Major American poets to 1917, including Poe, Whitman, Dickinson, and others. Cochran, Gutman. (Not offered 1984-85.)

**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.

**150 Modern Short Fiction. I, II.** Cochran, M. J. Dickerson, Gutman, Jones, Magistrale, Shepherd.

**151 Modern American Novel** American novelists from 1915 to 1945. Biddle, Cochran, Eschholz, Gutman, Poger, 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. (Not offered 1984-85.)

**154 Contemporary American Novel** Significant American novelists since 1945. Cochran, Gutman, Shepherd.

**155 Literature of Black America** Poetry, fiction, and drama by black writers since the turn of the century. M. J. Dickerson. (Alternate years, 1985-86.)

**177, 178 Advanced Writing** Students follow their own interests in the writing of poetry, fiction, and non-fiction. Permission of instructor required. *Prerequisite:* 53 for poetry and fiction, 50 for non-fiction. No more than six credit hours of English 177, 178 Advanced Writing will count toward fulfillment of major requirements. Broughton, Edwards, Huddle.

**191, 192 Internship** May not be used to satisfy major requirements. *Prerequisites:* Consent of instructor, junior or senior standing. One to six hours. Shepherd.

**193, 194 College Honors** Departmental permission required. Not to exceed three hours per semester.

**195, 196 Special Topics**

**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 instructors 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. *Prerequisites:* 50, 81, 82, 101, and one additional English course at the intermediate level. Biddle.

#### 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. Selig.

**6 Development of the Motion Picture II** An overview of the cinema's technological, artistic, economic, and sociological history from 1929-1960. Selig.

**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. Selig.

**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. Selig.

**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. Selig.

**271, 272 Seminar in Film** Selected topics in film. May be repeated with departmental permission. *Prerequisite:* Six hours of film courses, including 107. Selig.

## Environmental Studies (ENVS)

COLLEGE OF AGRICULTURE

COLLEGE OF ARTS AND SCIENCES

COLLEGE OF EDUCATION AND SOCIAL SERVICES

SCHOOL OF NATURAL RESOURCES

*Professors Reidel (Director), Worley; Assistant Professors Flack, Hudspeth (Assistant Director); Lecturers Fischer, Hollister, Houston; Adjunct Assistant Professors Brande, Eddy, Huffman.*

**1 Introduction to Environmental Studies I** 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. Reidel.

**2 Introduction to Environmental Studies II** Follow-up to ENVS 1 emphasizing political-legal-social aspects of governmental policy utilizing international case studies.

**51 Major Seminar** Analysis of environmental problems and issues from the perspective of various academic disciplines and professional fields, emphasizing interdisciplinary scholarship and research. *Prerequisites:* 1, major in Environmental Studies, permission of instructor. Three hours. Hudspeth, Reidel.

**100 Environmental Theory** Comparative analysis of emerging concepts of man/environmental relationships; the history, philosophy, and theoretical framework of environmental studies. *Prerequisites:* 2, standing as a major or coordinate major. 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.

**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, and international studies.

**201 Research Seminar** Planning, design, and methods of research for the study of environmental problems. Open to junior or senior majors in Environmental Studies. *Prerequisite:* 51. 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. (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 or coordinate major in Environmental Studies. Three hours. Hudspeth. (Not offered for graduate credit.)

**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, with emphasis on integrating environmental concerns into formal and non-formal 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, 296 Special Topics**

## Extra-Departmental Courses

### COLLEGE OF AGRICULTURE

#### AGRICULTURE (AGRI)

**99 Beginnings** Eight-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. One hour.

**195, 196 Special Topics** Appropriate for interdepartmental and interdisciplinary topics in Agriculture. Permission of Dean's Office. Credit as arranged.

### COLLEGE OF ARTS AND SCIENCES

**7 Earth, Air, Fire, and Water** See course description under Chemistry.

#### 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. Sandler.

**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. Alternate years, on demand.

**154 Greek Historians** Three hours. B. Rodgers. Alternate years, on demand.

**155 Ancient Epic** Three hours. Davison.

**156 Greek and Roman Satiric Spirit** Three hours. Alternate years, 1984-85.

**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.

**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, Heny, Woolfson.

### COLLEGE OF ENGINEERING AND MATHEMATICS

Technology—see page 171.

## Forestry (FOR)

### SCHOOL OF NATURAL RESOURCES

*Professors Hannah, Reidel, Whitmore (Program Chairperson); Associate Professors Armstrong, Bergdahl, DeHayes, Donnelly, Forcier, Newton; Assistant Professor Spearing; Extension Associate Professor Bousquet; Extension Assistant Professor McEvoy; Lecturer Turner.*

**1 Introduction to Forestry** Introduction to forestry and conservation sciences. 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.

**5 Dendrology (3-4)** Classification, silvical characteristics, and identification features of native and introduced trees and shrubs. *Prerequisite:* Biology 1 or Botany 4. Four hours. DeHayes.

**73 Small Woodland Management (2-4)** Concepts of forest ecology, resource inventory, cultural practices, and multiple use management for small woodland areas. *Prerequisite:* Junior standing. 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:* 5, Plant and Soil Science 161. Four hours. Donnelly, Hirth.

**122 Forest Ecosystem Analysis** Composition, structure, and dynamics of selected forest communities. *Prerequisite:* 120. Twenty days in summer camp. Four hours. Donnelly, Fuller.

**123 Silviculture (3-4)** Natural regeneration, production, and tending of forest stands. *Prerequisite:* 142 or Wildlife Biology 151. Four hours. Hannah.

**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.

**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. 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. *Prerequisites:* Sophomore standing, one course in forestry. 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.

**142 Forest Biometry II** Boundary and topographic survey methods in forest management. Principles of forest biometry in forest-data collection. *Prerequisites:* 5, 140, Civil Engineering 12. Twenty days in summer camp. Four hours. Newton, Turner.

**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, nine hours of Natural Resources courses. Three hours. Whitmore.

**151 Forest Economics** Economic principles and problems in management and utilization of forest resources; taxation of forest lands. *Prerequisites:* A course each in economics, statistics, and calculus. Three hours. Armstrong.

**162 Wood Technology (2-3)** Properties, uses, and identification of commercial woods of the U.S. *Prerequisites:* Botany 4, a course in tree identification. Three hours. 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.

**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. *Prerequisites:* A course in tree identification, permission. Three hours. Donnelly. Alternate years, 1985-86.

**181 Forestry Work Practicum** Supervised work experience in forest resource area. *Prerequisites:* Junior standing, permission. Credit arranged.

**185 Special Topics** Readings, investigations, and lectures in selected forest resource subjects. *Prerequisites:* Junior standing, permission. 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, 1984-85.

**222 Advanced Silviculture (2-4)** Scientific basis and contemporary status of silvicultural practices. *Prerequisites:* 123, permission. Three hours. Hannah. Alternate years, 1985-86.

**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, DeHayes. Alternate years, 1984-85.

**229 Water Relations of Plants** Soil-plant water relations. Terminology and measurement of soil moisture. Absorption, transport, and transpiration by plants. Effects of water excesses and deficits. *Prerequisite:* Permission. Three hours. Donnelly, Botany and Plant and Soil Science staff. Alternate years, 1985-86.

**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:* 132, 133, 134 or permission. Three hours. Bergdahl. Alternate years, 1985-86.

**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, 1985-86.

**244 Quantitative Assessments of Natural Resources** (See Natural Resources 244.) Three hours. Newton. Alternate years, 1985-86.

**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.

**262 Forest Products (2-4)** Wood products manufacture and distribution including lumber, veneer and plywood, pulp and paper. Wood preservation. *Prerequisite:* 162. Three hours. Bousquet. Alternate years, 1985-86.

**271 Applied Forest Management Decision Theory** Operations research procedures in forest management. Management strategies for industrial and public forestry operations. *Prerequisite:* 151. Three hours. Armstrong.

**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. (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:* 120 or permission. Three hours. Donnelly. Alternate years, 1984-85. (Not offered for graduate credit.)

**282 Seminar in Research Planning** (See Natural Resources 282.) One hour. Manning, Newton.

**285 Advanced Special Topics** Advanced special topics courses 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, Miles, VanderMeer (Chairperson); Associate Professors Barnum, Lind, Meeks; Assistant Professors Bodman, Ryerson.*

*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.

**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, Ryerson.

**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** 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, Ryerson.

**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 Special Topics

**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, Ryerson.

**146 North American Resources** Identification and analysis of natural regions as they reflect elements of the physical 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 United States** (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. Ecologic 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. Ryerson.

**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, Ryerson.

**193, 194 College Honors**

**195, 196 Special Topics**

**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, Ryerson.

**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, Ryerson.

**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**

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.

**95, 96 Special Topics**

**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 10. Four hours. Stanley.

**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. Three hours. Doolan, 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 10. 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. 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 Special Topics**

**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. Three hours. Bucke.

## Geology (GEOL)

### COLLEGE OF ARTS AND SCIENCES

*Professors* Hunt (Chairperson), Stanley; *Associate Professor* Drake; *Assistant Professors* Bucke, Doolan, Hannah, Mehrtens; *Adjunct Professors* Ratte, Hatch.

**1 Introductory Geology (3-3)** Process, agents, and

**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.

**231 Advanced Metamorphic Petrology** An interpretation of the petrogenesis of metamorphic rocks including a discussion of phase equilibria, textural interpretations plus the spatial and temporal relationships to tectonic events. *Prerequisite:* 131. Three hours. Doolan.

**232 Advanced Igneous Petrology** Application of phase equilibria, major and trace element geochemistry, and isotopic data to problems in igneous petrology, stressing modern theories of mantle structure and petrogenesis. *Prerequisite:* 131 or equivalent. Four hours. Hannah.

**233 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.

**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.

**241 Clastic Depositional Systems (3-3)** 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. Four hours. Mehrtens. Alternate years. (Not offered 1984-85.)

**243 Carbonate Depositional Environments (3-3)** Paleoenvironmental analysis of carbonate rocks including selected readings, field investigations, and petrographic studies. *Prerequisite:* 153. Four hours. Mehrtens. Alternate years.

**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 15. 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.

## German (GERM)

### COLLEGE OF ARTS AND SCIENCES

*Professor Mieder (Chairperson); Associate Professors Doane, Mahoney, Richel, Scrase.*

**1-2 Elementary German** Four hours.

**11, 12 Intermediate German** Literature and discussion of selected prose with review of grammar. *Prerequisites:* 1-2 or equivalent for 11; 11 for 12. Three hours.

**13, 14 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 13; 13 or 11 for 14. Three 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.

**101, 102 Introduction to German Literature** Survey of German literature from the beginnings to the 20th century. *Prerequisite:* 12 or 14 or equivalent. Three hours. Doane, Mahoney, Richel, 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:* 12 or 14 or equivalent. Three hours. Doane, Mahoney, Richel.

**193, 194 College Honors**

**195, 196 Special Topics** Advanced study in accordance with students' needs and interests. *Prerequisites:* 101, 102 or the equivalent, departmental permission. Three hours.

**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, Droste-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. Doane, 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. Doane, Mieder.

**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.

### GENERAL LITERATURE

**161, 162 German Literature in Translation** (See course description under Extra-Departmental Courses.)

## Hebrew (HEBR)

### COLLEGE OF ARTS AND SCIENCES

**1-2 Elementary Hebrew** The spoken language of everyday use with oral, aural, and written practice in speaking, reading, and comprehension. Four hours. Lewin.

**11, 12 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 and the Environment** Introduction to basic skills necessary to preserve, document, and re-use America's visible past, its architectural heritage. Students do projects in actual preservation problems in Vermont. *Prerequisite:* Junior or senior standing. 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.

## History (HIST)

### COLLEGE OF ARTS AND SCIENCES

*Professors* Andrea, Daniels, Davison, Felt, Hand, Hutton (Director of Graduate Studies), Metcalfe (Chairperson), Overfield, Schmokel, Seybolt, Spinner, Steffens, Stoler, Stout; *Associate Professors* Liebs, True; *Assistant Professors* Kenny, McGovern, Rodgers; *Adjunct Professor* Morrissey.

History course numbers are designed to indicate method of instruction and expected preparation level of students, as follows:

**1-9 Civilization Surveys** Open to freshmen and sophomores, but primarily designed for freshmen. Generally emphasize the textbook-lecture-exam approach.

**10-99 Specialized Introductory Courses** Designed for sophomores and juniors, open to all except graduate students. 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.

**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.

**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 United States** 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 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 history and criticism of biography, the role of the individual in history, and biographies of individuals. Three hours.

**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.

**35 Rise of Islam** Arab/Islamic civilization during its formative period, from the 6th through the 13th centuries A.D. Three hours.

**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 United States. Second semester: Asia, Africa, and Latin America. Three hours. 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 (1700-1971). 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. Daniels.

**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. Feeney, 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. (Normally spring semester.) 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 United States** 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 La Nouvelle 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. Kenny.

**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 Special Topics

**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 Topics in Medieval Culture** Examines selected issues relating to social and/or religious history of medieval Europe. Topics include: medieval town life, popular piety in the Middle Ages, the Crusades, monasticism, and heresy. *Prerequisite:* 5 or 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.

**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.** *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 philosophical, 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, with particular emphasis on the central period from the 1530's to the 1640's (the Henrician Reformation to the Revon). *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 period 1945-69. *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. Daniels.

**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., investigating the process of political, economic, social, and cultural integration and subordination through Canada's rejection of the Revolution, its diplomacy, its continental approaches, and the Myth of Friendship. *Prerequisites:* 7, 8, 75, or 76. Three hours. Kenny. Alternate years.

**176 Quebec: Province or Nation?** French-speaking Canada in 19th and 20th centuries. Concepts of "nationalisme," "survivance," and "messianisme." Study of political, economic, and social development, important public figures, and the relationship with the rest of Canada, stressing Quebec's particular and separate historical evolution. *Prerequisite:* 75 or 76 or three hours of Canadian Studies. Three hours. Kenny. Alternate years.

**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. Stout.

**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.

**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** *Prerequisites:* Junior or senior standing, permission of department. Three hours.

**195, 196 Special Topics** *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.*

**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. Daniels.

**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.

## Human Nutrition and Foods (HN&F)

### COLLEGE OF AGRICULTURE

*Professor Carew; Associate Professors Livak, Schlenker (Chairperson), Tyzbir; Assistant Professors Bartel, Pintauro, Ross, Soule; Extension Assistant Professor Wright; Adjunct Assistant Professor Stowell.*

**37 Basic Concepts of Foods (2-3)** Introduction to study of food which includes physical and nutritional properties 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 availability, function, utilization, and requirements in mammalian species. Credit not given for both 43 and 46 or 141. Three hours. Carew.

**44 Survey of the Field: Human Nutrition and Foods (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.

**136 Nutritional Evaluation of Food Processing (3-0)** Study of the stability and degradation of nutrients in foods resulting from processing, storage, and preparation. *Prerequisites:* 37, three hours in nutrition, organic chemistry. Three hours. Pintauro. Alternate years, Spring 1986.

**138 Quantity Food (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.

**139 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. *Prerequisite:* 138 or permission. Three hours. Fall.

**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. 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 1985.

**237 Readings in Food Science (3-0)** Critical survey of literature on recent developments in food research. *Prerequisites:* 135, junior standing, biochemistry. Three hours. Pintauro. Alternate years, Fall 1985.

**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. Alternate years, Fall 1984.

**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. Spring.

**245 Nutritional Biochemistry I (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 Clinical Nutrition (2-3)** Introduction to hospital structure, the health care team, medical records, nutrition counseling and assessment. Students assigned to a clinical setting for supervised observation and participation. *Prerequisite:* 247. Three hours. Bartel. Spring. (Not offered for graduate credit.)

**247 Diet Therapy (4-0)** Adaptations of the normal diet in conditions of health and disease including the physiological and psycho-sociological implications. *Prerequisites:* 130, 144, 242. Four hours. Ross. Fall.

**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 247; physiology; biochemistry; permission. Three hours. Livak. Spring. (Not approved for graduate credit.)

**249 Nutrition Seminar (1-0)** Review of recent developments in nutrition research. *Prerequisites:* 242, permission of instructor. One hour.

**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 1986.

**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 by faculty and business or community representative. Hours arranged; maximum up to 15 hours in 196 and 296 combined. *Prerequisite:* Departmental permission.

## Mathematics (MATH)

### COLLEGE OF ENGINEERING AND MATHEMATICS

*Professors Chamberlain, Cooke, Moser, Wright; Associate Professors Ashikaga, Burgmeier, Foote, Haugh; Assistant Professors Archdeacon, Costanza, Dinitz, Dummit, Kadas, Margolis, Pence, Teglas, Whaley, Zwick; Lecturers Aleong, Johansson, Kost, Lawlor, Morency, Puterbaugh.*

*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 Pre-Calculus 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, logarithms, 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 19 or above. Credit not given for both 2 and 10. *Prerequisite:* 1 or 9. Three hours.

**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 Pre-Calculus 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. Credit not given for more than one of the courses 20, 21. A student who completes 20 may be admitted to 22. *Prerequisite:* 19. Three hours.

**21\* Analytic Geometry and Calculus I** Plane analytic geometry and introduction to the calculus of one variable including limits, continuity, and the techniques and applications of differentiation. Credit not given for more than one course in either of the pairs 19, 21 and 20, 21. *Prerequisite:* 10; or 9 and 2; or strong background in secondary school algebra and trigonometry. Four hours.

\*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 Analytic Geometry and Calculus II** Techniques and applications of integration of functions of one variable,

the calculus of vector functions, and polar coordinates. *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 Analytic Geometry and Calculus III** Solid analytic geometry, the calculus of functions of two and three variables, infinite series, and elementary differential equations. *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 School Teachers** Informal approach to geometry is considered emphasizing the use of intuitive geometric concepts in the introduction or clarification of most topics of elementary school mathematics. Not open to mathematics majors. *Prerequisite*: 15 or a teaching certificate. Three hours. Alternate years, 1984-85.

**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, 1984-85.

**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, 1984-85.

**223 Introduction to Formal Language Theory** (Same as Computer Science 223.) Introduction to theory and applications of context-free languages. Phrase structure and con-

text free grammars, normal forms, pushdown automata, decision problems, power series in non-commuting 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; Computer Science 104. Three hours.

**230 Ordinary Differential Equations** Solutions of linear ordinary differential equations, the Laplace transformation, 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, 1985-86.

**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*: 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 Modern Algebra** Fundamental concepts of Abstract Algebra. Sets, mappings, groups, rings, integral domains, fields, homomorphisms, and isomorphisms. *Prerequisites*: 102 or 104. Three hours.

**252 Advanced Linear Algebra** Linear transformations and vector spaces, including Jordan forms. Symmetric, Hermitian, orthogonal and unitary matrices, and quadratic forms. *Prerequisites*: 124, 251 desirable. Three hours. Alternate years, 1985-86.

**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, 1984-85.

**255 Elementary Number Theory** Divisibility, prime numbers, Diophantine equations, congruence of numbers, and methods of solving congruences. *Prerequisite*: 102 or 104. Three hours.

**257 Theory of Groups** Study of various kinds and structures of groups. *Prerequisite*: 251. Three hours. Alternate years, 1985-86.

**258 Galois Theory** Galois theory leading to the insolubility of general quintic equations by radicals and

theorems on construction with straightedge and compass. *Prerequisite:* 257. Three hours. Alternate years, 1985-86.

**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, 1985-86.

**271 Applied Mathematics for Engineers and Scientists** Matrix Theory, Vector Analysis, Linear Ordinary Differential 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, 1984-85.

**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.

**276 Mathematics of Space Flight** Topics include orbit determination and prediction of natural and artificial satellites and projectiles. Astrodynamics coordinate systems and their transformations. Integration schemes and perturbation theory. Attitude determination. *Prerequisites:* 237, either Physics 15 or 24 recommended. Three hours. Alternate years, 1984-85.

**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, Marshall, Outwater, Pope, von Turkovich; Associate Professors Carpenter, Tevaarwerk; Assistant Professors Durham, Ortiz.

**1 Technical Graphics (0-6)** Orthographic and pictorial views, introduction to architectural drawing and other technical drawings. Not for engineering majors. Three hours. Marshall.

**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. Marshall.

**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. Hundal.

**14 Mechanics of Solids (3-0)** 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, concurrent enrollment in 12. Three hours. Outwater.

**41 Thermodynamics and Heat Transfer (3-2)** Principles of engineering thermodynamics; applications of these principles to thermodynamic cycles; introduction to heat transfer. *Prerequisites:* Physics 24, 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 or 115. 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. Durham.

**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 non-ferrous metals, ceramics. *Prerequisite:* 101. Three hours. Durham.

**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. Hundal.

**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. Ortiz.

**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. Martinek.

**150 The Engineering Profession (2-0)** The professional practice of engineering; laws and professional attitudes regarding design, standards of patient safety, liability, insurance, industrial hygiene, and contracts. *Prerequisite:* Senior standing. Two hours. Outwater.

**152 Safety Engineering (2-0)** (Same as Business Administration 274.) 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. Marshall.

**161 Manufacturing Engineering I (3-0)** Mechanical and thermal processing of metallic and non-metallic materials; casting, forming, cutting, grinding, joining, high energy forming, EDM, ECM, Laser and ultrasonic. *Prerequisite:* Senior ME standing. Three hours. von Turkovich.

**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. von Turkovich.

**170 Mechanical Design I (3-2)** Analytical analysis of linkages; stress-displacement analysis using energy methods, equilibrium matrices, membrane analogy; surface contact, gears, fasteners, shafts; design projects. *Prerequisite:* Junior ME standing. Four hours. Carpenter.

**171 Mechanical Design II (3-0)** Engineering elasticity, structural stiffness matrices, probabilistic and optimum design; introduction to finite element analysis. *Prerequisite:* 170. Three hours. Carpenter.

**172 Mechanical Design III (3-2)** Computer-graphic based system modelling, linkage synthesis, robot kinematics, optimization techniques. *Prerequisite:* 171. Four hours. Carpenter.

**175 Human Factors (2-3)** (Same as Business Administration 275.) Human sensory capabilities and limitations, design of information input, human motor activities and space relationships, introduction to work measurement. *Prerequisite:* Junior standing. Three hours. Marshall.

**176 Plant Planning and Design (3-3)** (Same as Business Administration 276.) 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. Marshall.

**185-186 Senior Project (0-6) (0-3)** 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. Two hours for fall; one hour for spring.

**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.

#### 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:* 50. Three hours. Hundal.

**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. Hermance, Ortiz.

**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. Ortiz.

**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. Martinek.

**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. Hermance, Ortiz.

**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. Tevaarwerk.

**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. Outwater, von Turkovich.

**281, 282 Seminar (1-0)** Presentation and discussion of advanced mechanical engineering problems and current developments. *Prerequisite:* Senior or graduate engineering enrollment. One hour.

## Medical Microbiology (MDMC)

### COLLEGE OF MEDICINE

*Professors Albertini, Gump, Johnstone, T. Moehring, Schaeffer (Chairperson), Stinebring; Associate Professors Boraker, Fives-Taylor, Novotny; Research Professor J. Moehring.*

**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. The standard methods of bacterial and bacteriophage genetics, including the fundamentals of recombinant DNA technology are presented. Recommended prerequisite for Molecular Genetics II (see Botany 252). *Prerequisite:* Permission of instructor. Three hours. Novotny. Alternate years.

**220 Clinical Microbiology** Comprehensive study of human pathogenic micro-organisms 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:* Microbiology and Biochemistry 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, cytokinetics and immunocompetence, tolerance, ontogeny and phylogeny of adaptive immunity, immunogenetics of transplantation, hypersensitivity states, and theories of antibody formation. *Prerequisite:* Consent of instructor. Four hours. Boraker. Alternate years.

## Medical Technology (MEDT)

### SCHOOL OF ALLIED HEALTH SCIENCES

*Associate Professors Breen, Lachapelle (Chairperson), Reed, Sullivan; Assistant Professors Baker, Chickering, Ezekiel, Sowek; Clinical Assistant Professor Russell; Instructor Czerniawski; Clinical Instructors Albarelli, Ballard, Cote, Dopp, Durett, Franco, Griffin, Hammond, Haupt, Isham, Keagle, Keathley, Letourneau, Morgan, Meunier, Page, Powden, Scanlon, Standage, Thibault, Thomas.*

**3 Medical Terminology** Terminology related to medical science and hospital services. Required of all students in Medical Technology. Open to Health Science students by permission of instructor. Fall. One hour. Breen.

**23 Introduction to Clinical Chemistry** Lectures and laboratory experiences in basic chemical tests performed on body fluids. Fall. Four hours. Sullivan, Sowek.

**34 Introduction to Hematology** Lectures and laboratory experiences in blood cells and coagulation factors. Spring. Three hours. Reed, Sowek.

**54 Introduction to Clinical Microbiology** Lectures and laboratory experiences related to the identification of bacteria in clinical specimens. Spring. Two hours. Ezekiel, Baker.

**61 Introduction to Immunohematology** Lectures and laboratory experiences in the basic principles of immunology and their application in immunohematology. Fall. Two hours. Chickering.

**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, Sowek.

**122 Advanced Clinical Chemistry** Advanced theory and practice dealing with analysis of body fluid chemical components. Spring. Three hours. Sullivan, Sowek.

**130 Hospital Practicum: Hematology** Practical experiences at the Medical Center Hospital. Fall and spring. One hour. Sowek, Reed.

**131 Advanced Hematology** Advanced theory and practice dealing with blood cells and coagulation factors. Fall. Three hours. Reed, Sowek.

**142 Immunology** Basic concepts and applications of the human immune system. Spring. Four hours. Lachapelle.

**150 Hospital Practicum: Clinical Microbiology** Practical experiences at the Medical Center Hospital. Fall and spring. One and a half hours. Baker, 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. Baker, Ezekiel.

**160 Hospital Practicum: Immunohematology** Practical experience at Medical Center Hospital and Red Cross Blood Center. Fall and spring. One hour. Chickering.

**162 Advanced Immunohematology** Advanced theory and experience related to human blood groups and transfusion practice. Spring. Three hours. Chickering.

**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. Breen, Russell.

**196 Senior Seminar** Review of case studies for clinical correlation. Introduction to other laboratory sections. Spring. Two hours. Breen.

**197-198 Senior Research** Individual research in field of medical technology. *Prerequisite:* Medical Technology major. Fall and spring. Variable credit.

**229 Seminar: Clinical Chemistry** Discussion of recent advances in Clinical Chemistry. One hour. Sowek, Sullivan. (Not offered for graduate credit.)

**239 Seminar: Hematology** Discussion of recent advances in Hematology. One hour. Reed, Sowek. (Not offered for graduate credit.)

**259 Seminar: Clinical Microbiology** Discussion of recent advances in Clinical Microbiology. One hour. Baker, Ezekiel. (Not offered for graduate credit.)

**269 Seminar: Immunohematology** Discussion on recent advances and practices used in transfusion of patients. *Prerequisite:* 40 or permission of instructor. Spring. One hour. Chickering. (Not offered for graduate credit.)

## Microbiology and Biochemistry (MCBI)

### COLLEGE OF AGRICULTURE

*Professors Johnstone, Racusen, Weller; Associate Professors Currier, Sjogren (Acting Chairperson); Visiting Associate Professor Kent; Research Assistant Professor Husted.*

**10 Molecules of Life (3)** The chemical substances and reactions that control important living processes. A direct introduction to biochemistry not requiring preparation in the sciences. Three hours. Racusen.

**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 MCBI 57. Sjogren. Also offered each spring. Fall term reserved for Allied Health Science students except by permission of instructor.

**191 Biochemistry of Nucleic Acids** Structure, function, and properties of nucleic acids, nucleoproteins, and enzymes or proteins that act on nucleic acids. Emphasis on experimental approach. *Prerequisite:* A course in biochemistry 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 MCBI 210. Racusen, Kent.

**202 Advanced Biochemistry (3-3)** Study of metabolic cycles emphasizing research methods involving radioisotopes and chromatography. *Prerequisite:* 201 or 203 or



permission of instructor. Three hours and lab (one hour) as MCBI 211. Currier.

**203 Molecular Biology (3-3)** Structure and biological function of nucleic acids, proteins, and enzymes. Emphasis on optical, electrophoretic, and ultracentrifugal methods. *Prerequisite:* Chemistry 160 or 162 or permission of instructor. Three hours and lab (one hour) as MCBI 212. Weller.

**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 microbiology, chemistry, and mathematics. Three hours. Husted.

**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 MCBI 221. Sjogren. Alternate years, 1985-86.

**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 MCBI 255. Sjogren. Alternate years, 1984-85.

**295 Special Topics** *Prerequisite:* Permission of instructor.

## Military Studies (MSTD)

*Lieutenant Colonel Brown (Chairperson); Majors Patzer, Bruner; Captains Donahue, Peterson; Sergeant Major Wallace; Master Sergeant Hopkins.*

*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. Students interested in pursuing an officer's commission through the ROTC should refer to page 38, or check with the Department of Military Studies.*

**1 Introduction to Military Studies (2)** 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; role of ROTC, the National Guard and Reserve; the military as a profession. *Prerequisite:* Freshman or sophomore standing. Fall and spring. Two hours. Bruner.

**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:* Freshman or sophomore standing. Fall and spring. Two hours. Donahue.

**3 The Non-Battle Role of the Military (2)** Examines political, social, economic, and educational implications generated by existence of armies; traditional role of nation building; an agent of social and economic rehabilitation. *Prerequisite:* Freshman or sophomore standing. Fall and spring. Two hours. Brown.

**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:* Freshman or sophomore standing. Fall and spring. Two hours. Bruner.

**5 Simulations and Wargaming (3)** Examines historical evolution of simulations; methods of simulation in current use; methods, applications, and uses of simulations in

resolving conflict including play-test of models. *Prerequisite:* Freshman or sophomore standing. Fall and spring. Three hours. Donahue.

**\*12 Rappelling (½ Physical Education credit)** Basic instruction in rope management, rope installation, and rappelling, consisting of both classroom instruction and outdoor practical exercises. Fall and spring. Hopkins, Wallace.

**\*16 Survival (1 Physical Education credit)** Instruction in wilderness survival techniques, to include land navigation, procurement of food, water, and shelter. Fall and spring. Hopkins, Wallace.

**\*17 Marksmanship (½ Physical Education credit)** Instruction in basic rifle marksmanship, to include hand and eye coordination, posture and breath, and trigger control. Fall and spring. Wallace.

**\*18 Backpacking/Orienteering (1 Physical Education credit)** Instruction in the basics of backpacking and land navigation, to include an overnight hike in the Green Mountains of Vermont. Fall and spring. Hopkins.

**101 Special Studies (Academic credit as arranged)** In-depth analysis of topics broached in 1, 2, 3, or 4. Guided research. Student proposes topic. Fall and spring. Two hours.

**102 Special Studies (Continuation of 101)** Fall and spring. 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. Peterson. (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. Developing leadership, counselling, and communication skills. Military cartography. Spring. Two hours. Peterson. (Not offered for graduate credit.)

**\*\*203 Leadership and Management III (2)** Analysis of techniques and procedures used in managing organizations and solving typical stressful leadership problems. Fundamentals of educational psychology applicable to instruction. Fall. Two hours. Patzer. (Not offered for graduate credit.)

**\*\*204 Leadership and Management IV (2)** Investigation of selected leadership and management problems associated with personnel unit administration, military law, and ethics. Obligations and responsibilities of an officer. Spring. Two hours. Patzer. (Not offered for graduate credit.)

\*Prerequisite for 12, 16, 17, 18: Freshman or sophomore standing or departmental permission.

\*\*Prerequisite for 201, 202, 203, and 204: Acceptance into Army ROTC Advanced Course or departmental permission.

## Music (MUS)

### COLLEGE OF ARTS AND SCIENCES

*Professors Chapman (Chairperson), T. Read, Wigness; Associate Professors J. Ambrose, Schultz; Assistant Professors Brown, Neiveem; Lecturer Parshley; Instructors Atherton, Boyer, Fleming, Goeghegan, Klimowski, E. Metcalfe, Parker, 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 ex-*



pected to regularly participate in ensembles. A reasonable division between large and small ensembles should be observed.

## THEORY AND COMPOSITION

*Music 3 is a one-semester course specifically designed for non-majors. Music 31, 32, covering the same material on a two-semester basis, are required of majors and minors, though open to adequately prepared non-majors as well. Because the material of the two courses is similar, credit cannot be given for both 3 and 31, 32.*

**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. Three hours.

**131, 132 Intermediate Theory** Contrapuntal and harmonic dictation; intermediate counterpoint and harmony. Music analysis. *Prerequisites:* 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

*Music 1 is a one-semester course specifically designed for non-majors. Music 11, 12, covering the same material on a two-semester basis, are required of majors and minors, though open to adequately prepared non-majors as well. Because the material of the two courses is similar, credit cannot be given for both 1 and 11, 12.*

**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:* Non-majors 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.

**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.

**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 14.

*For B.A. students with a concentration in performance and B.M. students, except theory majors, a senior recital is required. 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:

- a. Ability to sight-read songs of the type found in a community song book.
- b. 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.
- c. 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 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. May be repeated for credit.

**51-54 Performance Study** Private instruction in voice or an instrument. Subject to availability of staff. Lab fee required. Contact department office for placement. Not open for credit to music majors or minors. One hour. May be repeated for credit.

**151-154 Performance Study** Private instruction in voice or an instrument. Subject to availability of staff. Lab fee required. Contact department office for placement. Variable hours. Non-majors only may repeat for credit.

**251-254 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.

**186 Piano Repair - Tuning** To acquaint students with basic knowledge of piano construction, tuning, and repairing. Departmental permission. One hour.

**281 Elementary Music Education Methods** Methods and materials in the teaching of vocal and instrumental music in elementary school. *Prerequisites:* 177 or equivalent, junior standing in Music Education. Three hours.

**282 Secondary Music Education Methods** Methods and materials in the teaching of vocal and instrumental music in secondary schools. *Prerequisites:* 281, junior standing in Music Education. Three hours.

## Natural Resources (NR)

### SCHOOL OF NATURAL RESOURCES

*Professors Cassell, Lindsay, Reidel; Associate Professors DeHayes, Donnelly, Forcier, LaBar, Newton; Assistant Professors Clausen, Fuller, Hendrix, Manning; Extension Assistant Professor Marek; Lecturers Vissering, Wright.*

**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, Lindsay, Turner.

**40 The American Wilderness** History and philosophy of wilderness preservation. Emphasis on evolving attitudes toward wilderness, the National Wilderness Preservation System, and contemporary wilderness management issues. Not open to Recreation Management majors. Three hours. Manning.

**51 Environmental Aesthetics and Planning** Study of what constitutes the man-made and natural landscapes; development of a higher level of perception and insights into the profession of environmental design. Three hours. Vissering.

**76 Natural Resource Planning and Management for Vermont Landowners** The planning and management of private land ownerships for agricultural, forestry, recreation, residential, water, and wildlife uses. Three hours. Lindsay.

**102 Water as a Natural Resource** Effects of society on the water resource. Characteristics of watersheds, lakes, rivers, and wetlands; discussion of the management of these ecosystems. *Prerequisites:* Biology 1, Zoology 9 or Botany 4 or equivalent, and Chemistry 1, 3, 4, or 42 or equivalent. Three hours. Cassell, Donnelly, LaBar.

**143 Introduction to Geo-based Information Systems** Discussion and application of basic techniques in the use of computer based, geographically referenced natural resource information systems. *Prerequisites:* Sophomore standing and Computer Science 3 or 11. Three hours. Newton. (Not offered 1984-85.)

**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. Alternate years, 1985-86.

**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, etc. *Prerequisites:* Senior standing, permission. Three hours. LaBar. Alternate years, 1985-86.

**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. Hendrix.

**275 Natural Resources Planning: Theory and Techniques** Consideration of historical and theoretical roots of resource planning. Development of some skills mandated of natural resource planners. *Prerequisite:* Senior or graduate standing. Three hours. Hendrix.

**276 Water Quality for Natural Resource Managers** Study of major contaminants and their behavior in surface and groundwater systems. Field methods for water quality analysis. Extensive field project. *Prerequisites:* Senior standing, permission. Three hours. Cassell.

**278 Water Resources: Analysis, Planning, and Management** Study of the physical, chemical, and biological phenomena in rivers, streams, and lakes. Concepts of water resources modeling, planning, and management. *Prerequisites:* Senior standing, permission. Three hours. Cassell, Clausen.

**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

Professor Milligan (Director).

*Professional Nursing:* Professors Beeker (Chairperson), Sawyer; Associate Professors Cronin, Deck, Demers, Emerson, Forgione, Hamel-Bissell, Palmer, Murray, Schwalb, Valentine; Assistant Professors Ellis, Hadeka, Reed; Lecturers Clements, Laferriere.

*Technical Nursing:* Associate Professor Clarke (Chairperson); Assistant Professors Cohen, Fischer, Reardon; Lecturers Danielson, Hall, Hiser.

### FOR NON-MAJORS

**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.

**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 psychosocio-cultural effects on health, health care, and the professional nursing role. Introduction to cognitive processes and communication skills used in nursing. Three hours. Emerson, Reed.

**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 sciences — Chemistry 4, Anatomy and Physiology 19, Microbiology and Biochemistry 55. Three hours. Ellis, Valentine.

**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 are explored. Dynamics of groups (family and peer) introduced. Laboratory experiences in different hospital settings and with families in community. *Prerequisites:* 25, 26, Chemistry 3-4, Anatomy and Physiology 19-20, Microbiology and Biochemistry 55, Early Childhood and Human Development 80-81, Psychology 1, Human Nutrition and Foods 141, Sociology 10 or 11. Nine 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 level of wellness. Focus is on more complex nursing challenges. Laboratory experiences in community agencies including the hospital. *Prerequisite:* 126. 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. Beeker, Milligan, Sawyer. (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 9. Six hours. Clarke, Cohen, Hall, Hiser.

**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 9-10, Human Nutrition and Foods 46, Early Childhood and Human Development 80-81, English 1. Ten hours. Clarke, Danielson, Fischer, Reardon.

**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.

## Pathology (PATH)

### COLLEGE OF MEDICINE

*Professors Clemmons, Craighead (Chairperson), Howard, Korson, Perl, Stark, Trainer; Associate Professors MacPherson, J. B. McQuillen, Tindle, Winn; Assistant Professors Adler, Bovill, Hardin, Heintz, Huber, Krawisz, Lee, Mossman, Sharp.*

**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.

## Pharmacology (PHRM)

### COLLEGE OF MEDICINE

*Professors J. Bevan (Chairperson), Gans, Jaffe, McCormack; Associate Professors R. Bevan, Newman, Reit; Assistant Professors Ershler, Hacker, Scollins, Stewart; Research Assistant Professors Borman, Owen, Walmsley; Visiting Professor Maxwell.*

**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. Gans.

**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. Gans.

**290 Introduction to Pharmacology** Consideration of factors which determine the efficacy and safety of drugs with emphasis on representative agents used in medicine. *Prerequisites:* Introductory course in organic chemistry, background in physiology or health sciences. Three hours.

**328 Introduction to Medicinal Chemistry** Important classes of drugs are surveyed. Emphasis is placed 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 Moneta; Assistant Professors Kornblith, Kuflik, Miller.*

*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\*** Introduction 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. Hall, Kornblith, Miller, Sher.

**2 Historical Introduction to Philosophy\*** Works of major philosophers in the Western tradition considered in their historical and philosophical contexts. Three hours. Offered every semester. Moneta.

**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 more than one of 1, 2, and 3.

**4 Introduction to Ethics** Analysis of the principal problems and theories of ethics. Three hours. Offered every semester. Hall, Kuflik, Sher.

**13 Introduction to Logic** Study of the basic principles of deductive and inductive inference. Three hours. Offered every semester. Kornblith, Mann.

**101 History of Ancient Philosophy** Study of the works of the Pre-Socratics, Plato, Aristotle, and their suc-

cessors. *Prerequisite:* 1, 2, or 3. 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, 2, or 3. Three hours. Offered spring semester. 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. Offered once every two 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. Offered once every two years. Hall.

**110 Nature of Mind** Examination of philosophical issues raised by influential psychological views of the nature of the human mind. *Prerequisite:* 1, 2, or 3 or one course in psychology. Three hours. Offered every fall semester. Kornblith.

**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.

**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. Offered once every two years. 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. Offered once every two 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, 2, or 3. Three hours. Offered once every two years. Miller.

**132 Philosophy of History** Investigation of theories of history from perspectives of both historians and philosophers. *Prerequisite:* Six hours of philosophy or history. Three hours. Offered once every two years. Mann, Moneta.

**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, 2, or 3. Three hours. Offered once a year. Hall, Mann, Moneta.

**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, 2, 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, 2, 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, 2, 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, 2, 3, or 4. Three hours. Offered once a year. Kuflik, Sher.

**151 Philosophical Ideas in Literature** Philosophical themes as exemplified in literature. *Prerequisite:* One course in philosophy. Three hours. Offered once every two years. Hall, Moneta.

**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:* One course in philosophy. Three hours. Offered once a year. Hall.

**160 Phenomenology I** Systematic study of fundamental principles of the phenomenological method such as: intentionality of consciousness, phenomenological reflection, phenomenological reduction, concept of constitution, and inner time consciousness. *Prerequisite:* One course in philosophy. Three hours. Offered every fall semester. Moneta.

**193, 194 College Honors**

**195, 196 Special Topics**

**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. Mann, Moneta, 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. Offered once every two years. Kornblith, Sher.

**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.

**213 Mathematical Logic** Study of important advanced results in mathematical logic, including Godel's Incompleteness Theorems and an introduction to proof theory and recursive function theory. *Prerequisite:* 113. Three hours. Offered once every two years.

**215 Philosophy of Mathematics** Philosophical topics connected with mathematics. What (if anything) is mathematics about? How do we acquire our mathematical knowledge? *Prerequisite:* 113 or 213 or extensive background in mathematics. Three hours. Offered once every two years.

**217 Philosophy of Language** Philosophical study of the nature of language. *Prerequisite:* 113 or Linguistics 101, 102. Three hours. Offered once every two years. Hansen, Kornblith, Sher.

**221 Topics in Chinese Philosophy** Detailed examination of a classical Chinese philosophical text or school. *Prerequisite:* 121 or 122. Three hours. Offered once every two 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. Offered once every two 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. Offered once every two years. Kuflik, Sher.

**242 Justice and Equality** (Same as Political Science 213.) An examination of contemporary normative theories of distributive justice and equality. *Prerequisite:* 140, 142, 143, or 144. Three hours. Offered once a year. Kuflik, Sher; Wertheimer (Political Science).

**260 Phenomenology II** Critical and intensive investigation of the thought of a major 20th century phenomenologist, e.g. Husserl, Heidegger, Merleau-Ponty, or Gadamer. *Prerequisite:* 160. Three hours. Offered every spring semester. Moneta.

**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. Offered once every two years. Hall.

**265 American Philosophy** The thought of such leading American philosophers as Peirce, James, Royce, Santayana, Dewey, and Whitehead. *Prerequisites:* 101, 102. Three hours. Offered once every two 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.

**281, 282 Seminar** Selected topics in philosophy. *Prerequisite:* An appropriate 200-level course in philosophy. Three hours.

**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.

petency in evaluation and treatment procedures: massage, physical agents, sensorimotor development, therapeutic exercise, and physical rehabilitation, culminating with the investigation of more complex medical problems and their management. II: three hours; III: three hours; IV: three hours; V: five hours; VI: five hours; VII: three hours. *Prerequisite:* Satisfactory completion of preceding courses. Neuroanatomy 202 is prerequisite for 122 and 151. Bevins, Delehanty, Held, Reed, Feitelberg, Moffroid, Zimny.

**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, Bevins, Zimny.

**128-158 Clinical Education I-II** Students assigned to approved clinical centers in northeastern U.S. 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 of junior year, and January-March of senior year.) I: four hours; II: six hours. *Prerequisite:* Satisfactory completion of all departmental courses. Wilkinson.

**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.

**142 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. Moffroid.

**144 Health Care Systems** An overview of present health care system, emphasizing issues and aspects specifically related to physical therapists. Two hours. Feitelberg.

**173-174 Principles of Organization and Administration — Principles of Education** Analysis of current methods; investigation of new patterns to meet future needs, and identification of alternate models through group problem solving. Introduction to learning theory, and participation in teaching experiences. Two-two hours. Feitelberg, Wilkinson, Nalette.

**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. Two hours. Moffroid, Held.

## Physical Therapy (PT)

### SCHOOL OF ALLIED HEALTH SCIENCES

*Professor Feitelberg (Chairperson); Associate Professors Moffroid, Wilkinson; Assistant Professors Held, Reed; Lecturers Bevins, Delehanty, Nelson, Zimny; Clinical Assistant Professors Emery, E. Nalette, Smith; Clinical Instructors D. Nalette, Sulima, Tandy.*

**21 Physical Therapy I** History and current trends of profession emphasizing medical-ethical-legal aspects of practice. Role of therapist in treatment, health care environment, and as team member. Supervised observation in approved clinical centers. Three hours. Feitelberg, Wilkinson.

**22-121-122-124-151-152 Physical Therapy Procedures II-VII** This sequence develops increasing levels of com-

## Physics (PHYS)

### COLLEGE OF ARTS AND SCIENCES

*Professors Arns, Brown, Crowell, Detenbeck, Krizan, Lambert (Acting Chairperson), Nyborg, Scarfone; Associate Professors Rankin, Sachs; Assistant Professor Spertalian.*

**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 to be announced in advance. Students may enroll in from one to three credits. Limited use of algebra and geometry. No prerequisites.

**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. Planetary and extragalactic astronomy, relativity, and cosmology. 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 (3-2) or (3-0)** Survey of principles of classical and modern physics without calculus, appropriate for students concentrating in life and health sciences. With laboratory, satisfies minimum requirement for premedical students. *Prerequisites:* 11 or 15 for 12; secondary school algebra and trigonometry. Four or three hours.

**15, 16 General Physics (3-2)** Introduction to principles of physics, in which students use calculus as course develops. Appropriate for students in the natural sciences and recommended for students in premedical programs. *Prerequisites:* 15 or 24 for 16; Math. 20 or concurrent enrollment or credit in Math. 21 for 15. Four hours.

**24, 125 Fundamentals of Physics (3-2)** For students of engineering or physical science. Electricity, magnetism, electromagnetic waves, and optics. *Prerequisites:* For 24, Math. 21 and credit or concurrent enrollment in Math. 22; for 125, 24 and credit or concurrent enrollment in Math. 121. Four hours.

**121 Biological Physics (3-2)** Physical laws, concepts, and methods discussed with respect to their reference to biology. *Prerequisites:* 12 or 16, Chemistry 2, Math. 22. Three 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:* 16 or 125, Math. 121. Four hours.

**155 Optics** An introduction to geometric and physical optics from prisms and lenses to lasers and holograms. *Prerequisites:* 125 or 16, Math. 121. Three hours. Alternate years, 1985-86.

**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 1985.

**193, 194 College Honors**

**195, 196 Special Topics**

**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:* 16 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:* 16 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:* 16 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 1986.

**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. Alternate years, Spring 1985.

**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 1985.

**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, Spring 1986.

**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 1986.

**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.

**265a, b, c Thermal Physics** A sequence of three units or mini-courses: 265a, Thermodynamics; 265b, Kinetic Theory; 265c, Statistical Mechanics. Students may enroll in from one to three units for one credit each. *Prerequisites:* 128 or 16, Math. 121 for 265a; 265a or other thermodynamics course for 265b; 265b for 265c. One to three credits. Alternate years, Spring 1985.

**273 Quantum Mechanics I** Introduction to nonrelativistic quantum mechanics. Schrodinger equation and applications to simple systems. *Prerequisites:* 128, 211. Three hours.

**295, 296 Special Topics**

## Physiology and Biophysics (PSLB)

### COLLEGE OF MEDICINE

*Professors Alpert (Chairman), Gibbons, Hendley, Low, McCrorey; Associate Professors Halpern, Webb; Assistant Professors Evans, Hamrell, Kimura, Patlak, Warshaw; Research Assistant Professors Hultgren, Litten, Maughan, Mulieri, Stirewalt.*

**9-10 Principles of 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. Histophysiological correlations of body systems discussed. *Prerequisites:* Limited only to students from two-year Allied Health and Nursing programs; 9 for 10. Four hours per semester. Parsons, McCrorey.

**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. Histophysiological correlations of body systems. Required for all 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. Five hours per semester.

## Plant and Soil Science (PSS)

### COLLEGE OF AGRICULTURE

*Professors Bartlett, Boyce, MacCollom, Wood; Extension Professor Way; Associate Professors Magdoff, Murphy, Parker, Pellett; Extension Associate Professors Costante, Gottlieb (Chairperson); Extension Assistant Professor Perry; Lecturers Villamil, Margolis.*

**5 Beekeeping** Principles and practices involved in beekeeping, including history, management practices, equipment needs, and honey production. Two Saturday field trips. Course does not meet distribution requirements for P&SS majors. Offered only in Evening Division. One hour.

**10 Home and Garden Horticulture** Planning, selecting, and maintaining shrubs, trees, flowers, lawns, fruits, and vegetables around the home. Designed primarily for non-agricultural 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.

**112 World Crops** Effect of environment, nutrition, and management on crop growth, distribution, and production of world food supplies. *Prerequisite:* 11 or Botany 4. Three hours. Wood. Alternate years, 1984-85.

**114 Laboratory and Field Photography** Introduction to still and super-8 photography for student and researcher in biological sciences. Course does not meet distribution requirements for P&SS majors. Offered only in Evening Division. *Prerequisite:* Math. 9. Three hours. Wood. Alternate years, 1985-86.

**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.

**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.

**132 Landscape Design I (2-3)** Introduction to theory of landscape design and its relationship to man, man-made structures, and the natural environment. *Prerequisites:* 11, 125. Three hours. Vissering.

**133 Landscape Design II (2-6)** Application of landscape design theory to residential and small buildings. *Prerequisite:* 132. Four hours. Hendrix.

**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. Wood. Alternate years, 1985-86.

**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. Wood. Alternate years, 1984-85.

**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. Magdoff.

**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.

**202 Micrometeorology (2-3)** Theoretical and practical considerations of the micrometeorological factors that affect plant growth and agricultural practices. *Prerequisite:* 11. Three hours. Whipkey. Alternate years, 1984-85.

**205 Mineral Nutrition of Plants** (See Botany 205.) Alternate years, 1984-85.

**207 Water Relations of Plants** (See Forestry 229.) Three hours. Donnelly and Botany and Plant and Soil Science staff. Alternate years, 1985-86.

**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. Wood. Alternate years, 1985-86.

**215 Weed Science (2-3)** Principles and practices of weed science, including weed identification, ecology, reproduction, control, and integrated pest management. *Prerequisite:* 11, 161. Three hours. Murphy. Alternate years, 1984-85.

**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, 1984-85.

**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. Bartlett. Alternate years, 1984-85.

**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. Bartlett.

**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. Bartlett. Alternate years, 1984-85.

**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. Fall semester students with odd S.S. number, spring semester students with even S.S. number. *Prerequisite:* Senior standing. One hour.

## Political Science (PSCI)

### COLLEGE OF ARTS AND SCIENCES

*Professors Hilberg, Wertheimer; Emeritus Professor Little; Associate Professors Bryan, Mahler, Nelson, Nivola, Pacy; Assistant Professors Burke, Feldman, Haltom, Holland, Rice.*

*The following courses (21, 31, 51, 71, 81) may all be taken without prerequisite. Each course introduces students to a different sub-field of political science.*

**21 American Political System** Institutions, processes, and problems of American government. Three hours. Bryan, Burke, Feldman, Haltom, 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, Wertheimer.

**51 International Relations** The state as actor in international relations. Global division and problems. Three hours. Hilberg, Pacy.

**71 Comparative Political Systems** Examination of political behavior, political structures, and political pro-

cesses from a cross-national perspective. Three hours. Mahler.

**81 Political Behavior** Introduction to the political beliefs and activities of individual citizens. Topics include: voting, elections, socialization, and public opinion. Three hours. Rice.

**96 Seminar** Selected topics in political science. Three hours.

*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.

**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.

**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.

**172 Russian and Eastern European Political Systems** Examination of the Russian and some other Eastern European Communist political systems. *Prerequisite:* 71. Three hours.

**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.

**177 Political Geography** (See Geography 177.) *Prerequisite:* 51 or 71. Three hours. 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 non-leaders 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 Special Topics.** *Prerequisite:* As specified. Three hours.

**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, 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.

**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. Haltom.

**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. 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.

**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.

**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.

**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. 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.) *Prerequisite:* 51, three hours at 100 level. Three hours. Daniels.

**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 Seminar** Selected topics in political science. *Prerequisite:* As specified. Three hours.

**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

*Professor Emeritus Ansbacher; Professors Achenbach, Albee, J. Burchard, Forgays, Howell, Joffe, Kapp, Lawson, Leitenberg, Musty (Chairperson); Associate Professors Bond, Gordon, Hasazi, Kessler, Leff, Rosen, Yadav; Assistant Professors Bouton, Bronstein, Compas, Lorenz, Miller, Rothblum; Adjunct Associate Professor Copeland; Adjunct Assistant Professors Schwaber, Stoltenberg, Thompson; Research Assistant Professor S. Burchard; Clinical Assistant Professors Carling, Dietzel, Does, Peyser, Pithers, Solomon; Adjunct Instructors Benay, Reimondi; Clinical Instructor Cioffari.*

*Note: Courses are offered every semester except those noted in parentheses after the course title. Abbreviations: F, fall semester; S, spring semester.*

**1 General Psychology** Introduction to the entire field, emphasizing the behavior of the normal adult human being. Three hours. Forgays, Albee, Musty.

**109, 110 Principles of Psychological Methodology and Research** Prepares students to understand and to do competent research in a variety of areas of psychology. Focus upon designs, methodologies, and statistical procedures essential for psychological research. Laboratory experiences. *Prerequisite:* 1. Four hours. Gordon, Bouton, Howell.

**119 History of Psychology(s)** Review of major theoretical and empirical developments in psychology, including schools of psychology that have influenced contemporary models of psychology. *Prerequisite:* 1. Three hours. Howell.

**121 Biopsychology (S)** Principles of biological bases of behavior through classical and contemporary issues, including introduction to nervous system, physiological and behavioral effects of drugs, chemical bases of behavioral disorders, hormonal control of behavior, intercerebral disorders of behavior, and voluntary control of bodily functions. *Prerequisite:* 1 or Biology 1. Three hours. Kapp, Lorenz, Musty.

**130 Social Psychology** A psychological approach to social phenomena emphasizing concepts and methods used in study of the behavior of individuals in various social situations. *Prerequisite:* 1. Three hours. Leff, Miller.

**132 Environment and Behavior (F)** Introduction to Environmental Psychology. Major sub-areas of this field are discussed as they relate to the interaction between the behavior of man and the environment. *Prerequisite:* 1 or course in environmental studies. Three hours. Forgays.

**150 Personality** The understanding of personality development and human behavior from a psychoanalytic, humanistic, trait measurement, and sociocultural perspective. Applicability to the student her/himself stressed. *Prerequisite:* 1. Three hours. Bronstein.

**152 Abnormal Psychology** Describing and defining abnormal behavior; explanatory models to account for disturbances; research evidence for biological and social models; methods of intervention and prevention. *Prerequisite:* 1. Three hours. Rothblum.

**153 Behavior Modification (F)** Survey of techniques for the analysis and change of human behavior, and evaluation of their effectiveness. *Prerequisite:* 1. Three hours.

**161 Developmental Psychology: Childhood** Survey of research and theories on child development from conception to adolescence emphasizing experimental analyses of early social, cognitive, and perceptual development. *Prerequisite:* 1. Three hours.

**162 Development of Sex Differences (S)** Critical analysis of research and theory on factors that influence the development of 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, in persuasive campaigns in such areas as health, political, consumer behavior. *Prerequisite:* 1. Three hours. Yadav.

**193, 194 College Honors**

**195, 196 Special Topics**

**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. Three hours. Bouton.

**206 Motivation (S)** Theory and research on the nature of motives, their influence on behavior, and their relation to other psychological processes. *Prerequisite:* 110. Three hours. Joffe.

**220 Animal Behavior (F)** Behavior of animals under controlled experimental conditions and in their natural environments. Consideration of evolution, development, function, and control of behavior. *Prerequisite:* 109 or 121. Three hours. Bouton.

**221 Physiological Psychology I (F)** Structure and function of mammalian nervous system, emphasizing neurological correlates of sensory experience and perception. Individual laboratory experience. *Prerequisite:* 110. Four hours. Kapp.

**222 Physiological Psychology II (S)** 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 (S)** Intensive analysis of effects of drugs (both medical and recreational) on behavior. Topics such as drug effects on learning, memory, motivation, perception, emotions (both normal and abnormal), and aggression in both animals and men. *Prerequisites:* 110, 121 or 222 or permission. Three hours. Musty.

**230 Advanced Social Psychology (S)** Advanced sur-

vey covering current research in various fields of social psychology. *Prerequisite:* 110. Three hours. Miller.

**233 Psychology of Environmental Experience (F)** 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 (S)** Examines psychological foundations of potential changes in social and physical environment that would enhance quality of life for all people. 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, non-verbal codes, meaning, cognition, and interpersonal and socio-cultural context in human communication process. *Prerequisite:* 109 or 130. Three hours.

**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:* 1 and 109, or 130, or 230; other advanced background in education or a social science.

**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, such as client-centered, habit change, cognitive change, emotional change, interpersonal relations, and group therapy approaches. *Prerequisite:* 110. Three hours. Bronstein, Compas, Kessler.

**251 Behavior Disorders of Childhood** A wide range of topics from brain damage to childhood psychoses and nightmares. Each problem behavior considered in context of normal child development. *Prerequisite:* 110. Three hours. Hasazi.

**253 Advanced Behavior Modification (S)** Application of technique for the manipulation and control of human behavior in a variety of educational and social situations involving the collection and analysis of behavioral data. *Prerequisites:* 153, 109. Three hours.

**261 Cognitive Development (F)** 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:* 161 or 109 (concurrently), or permission of instructor. Three hours. Bond.

**262 Social Development (S)** Examination of theory and research concerning interpersonal development in humans from infancy through adulthood. Relationships between language, cognition, and social development emphasized. *Prerequisite:* 161 or 109 (concurrently), or permission of instructor. Three hours.

**264 Developmental Psychobiology (F)** 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:* 109 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 pre-school to adolescence. Relationship between television violence and abnormal

behavior examined. *Prerequisites:* 1, 109, or 161 or 163. Three hours.

**295, 296 Contemporary Topics** Three hours.

## Radiologic Technology (RT)

### SCHOOL OF ALLIED HEALTH SCIENCES

*Associate Professor Izzo (Chairperson); Lecturers Farnsworth, Marschke; Clinical Instructors Bohannon, Cunningham, Fuller, Lacasse, Mattera, Morley, Smith.*

#### FOR NON-MAJORS

**55 Radiation and Man** A mini-course to introduce non-majors to radiation. Covers applications in medicine and industry as related to benefits and risks. *Prerequisite:* Sophomore standing. One hour (five weeks). Izzo, Marschke. (Offered in fall and spring.)

#### 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. Lacasse.

**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. Izzo.

**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. Izzo.

**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 9-10. One hour. Izzo, Mattera.

**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 and 4. Three hours. Izzo, Mattera.

**33, 34 Nuclear Medicine Clinical Practicum (0-4)** Routine imaging procedures emphasizing patient positioning, instrumentation, and film processing on Picker and Ohio Nuclear Gamma Cameras; includes introduction to pharmacology. *Prerequisite:* Enrollment in Radiologic Technology. One hour. Bohannon.

**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. Izzo, Mattera.

**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. 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.

**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.

### RADIOGRAPHY MAJORS

**11, 12 Introduction to Radiography (1-6)** Study of anatomic orientation and patient positioning, techniques for radiographic imaging. Anatomic areas included are: upper and lower extremities, routine chest, and abdomen. Three hours each. Farnsworth, Fuller, Cunningham.

**13, 14 Radiographic Clinical Practicum (0-8), (0-12)** Observation and participation in routine radiographic procedures at the Medical Center Hospital of Vermont, Fanny Allen Hospital, and University Health Center. Two hours, three hours. Farnsworth, Cunningham.

**15 Principles of Radiographic Exposure (2-0)** Introduction to technical factors influencing radiographic exposure including MAS, KVP, grids, screens, collimators, and film processing. Two hours. Farnsworth.

**110 Clinical Radiology for Radiographers (2-0)** A system by system study of the etiology of human disease emphasizing radiographic manifestations and diagnosis of that disease. *Prerequisite:* Anatomy and Physiology 9-10. Two hours. Lacasse, Farnsworth.

**111 Advanced Radiography (2-2)** Introduces the student to special procedures requiring greater independent judgment and technical skills. Four hours. Smith, Farnsworth.

**113, 114 Advanced Radiographic Clinical Practicum (0-20, 0-20)** Continued development of clinical skills emphasizing all radiographic positioning with experience in special procedures and selected adjunctive techniques. *Prerequisites:* 77 for 113, 113 for 114. Four hours each. Farnsworth, Cunningham.

**115 Radiographic Science (3-0)** Continued study of exposure principles emphasizing the physical foundations governing X-ray production, recording, and control. Three hours. Farnsworth.

### 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:* Enrollment in Therapy program. Two hours. Marschke.

**23, 24 Radiation Therapy Clinical Practicum (0-4)** Students observe and participate in the Medical Center Hospital of Vermont Radiation Therapy Department. *Pre-*

*requisite:* Enrollment in Therapy program. One hour. Morley.

**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 with emphasis placed on increasing clinical capabilities. *Prerequisites:* 23, 24. Three hours each. Marschke, Morley.

**125 Clinical Oncology (3-0)** Educates the student in various types of neoplasms, methods of treatment, and elementary pathology. *Prerequisite:* Anatomy and Physiology 9-10 or permission of instructor. Three hours.

**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

*Extension Professor Bevins; Associate Professors Gilbert, Lindsay (Program Chairperson), Manning; Assistant Professor Hudspeth; Lecturers Baker, Kaufman, Koenemann, Vissering.*

**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. Koenemann.

**40 The American Wilderness** (See Natural Resources 40.) Three hours. Manning.

**138 Park and Recreation Design** Recreational design methodology applied to the design of public and private recreational facilities. *Prerequisites:* Junior standing in Recreation Management, permission. Four hours. Vissering.

**150 Recreation Management** Field experience in recreation planning, design, and resource measurement. *Prerequisite:* Civil Engineering 12. Four weeks in summer following sophomore year. Four hours. Lindsay.

**151 Food and Lodging Business Management** Economic decision-making for the food and lodging industry. Emphasis on analysis of business investment and profitability over the recreation firm's life. *Prerequisite:* Permission of instructor. Three hours. Bevins. Credit cannot be granted for both 151 and Agricultural and Resource Economics 166. Alternate years, 1984-85.

**153 Recreation Administration and Operations** Administration and operation of public outdoor recreation areas. Special emphasis on recreation administrative structures, personnel management, and maintenance of parks and outdoor recreation areas. *Prerequisites:* Senior standing, permission. Three hours. Baker, Manning.

**155 Environmental Interpretation** Discussions and application of principles and techniques used to communicate values, natural systems, and cultural features to park visitors. Exposure to collecting, analysis, planning, construction, and use of interpretive media and related outdoor facilities. *Prerequisites:* Senior standing, permission of instructor. Three hours. Hudspeth.

**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, 1984-85.

**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.

**159 Participation in Recreation Management** Supervised field experience in national, state, urban, or private park and recreation operations. *Prerequisites:* Junior standing, permission. Three hours. Gilbert, Lindsay, Manning, Vissering.

**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 Readings, investigations, and lecture-discussions in selected areas of recreation management.** *Prerequisites:* Junior standing, permission. One to three 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. Gilbert, Bevins.

**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. Three hours. Lindsay.

**240 Wilderness and Wilderness Management** History, philosophy, and management of wilderness, national parks, and related areas. *Prerequisite:* Permission. Three hours. Manning.

## Religion (REL)

### COLLEGE OF ARTS AND SCIENCES

Associate Professors Andrews, Martin (Chairperson), Paden; Assistant Professors Brenneman, Gussner, Sugarman, Yarian.

*Credit will be given only for two courses at the introductory level. Credit will not be given for both Religion 22 and 23.*

**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, Yarian.

**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, Martin, Paden, Yarian.

**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, Gussner, Martin, Paden, Sugarman, Yarian.

**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, Martin, Paden, Sugarman, Yarian.

95, 96 Special Topics

**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, Yarian.

**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, Yarian.

**106 Art and the Sacred** Cross-cultural study of the role and meaning of visual objects and images which are religious expressions themselves or are in important ways related to religious experience, e.g. in the creative process and worship. *Prerequisite:* Three hours in religion. Three hours. Yarian.

**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, Yarian.

**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, Yarian.

**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.

**120 The New Testament** The origin and nature of early Christianity emphasizing the New Testament writings. *Prerequisite:* Three hours in religion. Three hours. Martin.

**124 Christianity** Historical and phenomenological study of the central teachings and practices of the Eastern Orthodox, Roman Catholic, and Protestant branches of the Christian tradition. *Prerequisite:* Religion 22 or 23, or English 62. Three hours. Yarian.

**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** Selected texts, disciplines, and doctrinal developments in Indian, Tibetan, and Chinese Buddhism. *Prerequisite:* Three hours in religion. Three hours. Andrews, Gussner.

**141 Religion in Japan** The religion of shrine and temple, of Shinto and Buddhism, and their interaction with the rich folk traditions of Japan. *Prerequisite:* Three hours in religion. Three hours. Andrews.

**145 Religion in China** Examination in historical context of the Confucian, Taoist, and Chinese Buddhist traditions from a variety of interpretive perspectives, both Chinese and Western. *Prerequisite:* Three hours in religion. Three hours. Andrews.

**151 'Primitive' Religions** Study of the religiousness of man and its external expressions in small-scale hunting and planting societies, with reference to anthropological, socio-

logical, and psychological contributions to the subject. *Prerequisite*: Three hours in religion. Three hours. Gussner.

**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 individual self-understanding 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 Special Topics**

**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 71 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.)

**224 Studies in Christianity.** Concentrated study of a particular mode of Christian life which has found varied expression from early to contemporary church history, e.g. monasticism, pilgrimage, cosmology, mysticism. *Prerequisite*: Nine hours in religion, with three hours at the intermediate level (120 or 124 recommended). Three hours. Yarian. (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. *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. Sugarman, Yarian. (Not offered for graduate credit.)

**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

*Professor Sargent; Associate Professors Armstrong, Gilbert.*

**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. Sargent.

**RSEC 222 Natural Resources Evaluation** Critical investigation of current research, allocation procedures, and methods of analysis in natural resource economics with emphasis on the public sector. *Prerequisite*: 121. Three hours. Gilbert.

**RM 225 Economics of Outdoor Recreation and Tourism** (See Recreation Management 225.) Three hours. Bevins, Gilbert.

**AREC 233 Rural Planning** Study of rural, regional water, and natural resource planning concepts and principles. Field exercises in plan evaluation, carrying capacity, agricultural land protection, growth control, etc. *Prerequisites*: Senior standing, Agricultural and Resource Economics 61 or equivalent. Three hours. Sargent.

**RSEC 255, 256 Special Topics in Resource Economics**

## Romance Languages (FREN, SPAN)

### COLLEGE OF ARTS AND SCIENCES

*Professors Ugalde, Weiger, Zarate; Associate Professors Carrard, Crichfield, T. Geno, Murad, Senecal, Wesseling, Whatley (Chairperson); Assistant Professors Van Slyke, Whitebook, Wiley-Sandler; Lecturer M. Geno.*

*French 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.*

## 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. Both semesters required. 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.

**101, 102 Composition and Conversation** Use of contemporary attitudes and problems as a basis for class discussions and weekly written work. Three hours each course.

**201, 202 Advanced Composition and Conversation** Course activities (discussions, exposes, written work, etc.) designed to lead to mastery of French oral and written expression. Three hours each course. (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 1985.

**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.

## SPANISH LANGUAGE

**1-2 Elementary Fundamentals** of Spanish: pronunciation; speaking; reading; the structure of the basic Spanish sentence. Both semesters required. 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.

**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. Ugalde. (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, 1984-85.

**193, 194 College Honors**

**195, 196 Special Topics**

**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, 1985-86.

**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, 1985-86.

**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. Wiley-Sandler. Alternate years, 1985-86.

**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. Wiley-Sandler. Alternate years, 1985-86.

**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, 1984-85.

**246 17th Century** Selected works of the century with emphasis on Corneille, Racine, and Moliere. Three hours. Whatley. Alternate years, 1984-85.

**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. Whatley. Alternate years, 1985-86.

**256 18th Century Literature** Rousseau, Diderot, Laclos, Sade: the generation before the Revolution. Possi-



ble topics: the attempts to define "natural man," the relationship between the arts and morality, between liberty and libertinism. Three hours. Whatley. Alternate years, 1985-86.

**265 The Romantic Period** Major figures and themes of the Romantic movement, including Chateaubriand, Madame de Staël, Hugo, Balzac, Stendhal, Musset. Possible topics: the revolt against Classicism, the Romantic view of nature, *le vague des passions*. Three hours. Crichfield. Alternate years, 1985-86.

**266 Realism to Symbolism, 1850-1900** The rise of modern literary realism, Naturalism, Symbolist poetry, Decadence. Authors include Flaubert, Zola, Maupassant, Baudelaire, Verlaine, Rimbaud, Mallarmé, Huysmans. Three hours. Crichfield. Alternate years, 1985-86.

**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, 1984-85.

**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, 1985-86.

**285 Quebec Literature I** Study of fiction and poetry from 1835 to 1940. Three hours. Senecal. Alternate years, 1984-85.

**286 Quebec Literature II** A continuation of 285, encompassing fiction, poetry, and theatre from 1940 to 1975. Three hours. Senecal. Alternate years, 1984-85.

**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, 1984-85.

**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, with an emphasis on the most recent changes. (French 291 or History 53 or 153 strongly recommended.) Alternate years, Fall 1984. Three hours. M. Geno.

**293 Quebec Culture** Sociocultural study of the Francophone civilization of Canada. Three hours. Senecal. Alternate years, 1985-86.

**295, 296 Advanced Special Topics**

**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, 1984-85.

**156 Masterworks** Representative plays, novels, poetry since 1800. Three hours. Wesseling. Alternate years, 1984-85.

**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, 1985-86.

**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, 1985-86.

**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, 1985-86.

**193, 194 College Honors**

**195, 196 Special Topics**

**197, 198 Readings and Research**

**235, 236 Golden Age** The picaresque novel, the drama and poetry of the 16th and 17th centuries, with emphasis on Lope de Vega, Calderon, Quevedo, Tirso de Molina. Three hours each course. Weiger. Alternate years, 1985-86.

**245, 246 Cervantes** *Don Quijote*, the *Novelas Ejemplares*, and the theatre of Cervantes. Three hours each course. Weiger. Alternate years, 1984-85.

**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, 1985-86.

**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. Ugalde. Alternate years, 1985-86.

**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. (Not offered for graduate credit.) Alternate years, 1985-86.

**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, 1984-85.

**291 Civilization of Spain** Topical approach to the study of Spanish Civilization emphasizing ideas, art, literature, and music. Three hours. Ugalde. Alternate years, 1984-85.

**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, 1985-86.

**295, 296 Advanced Special Topics**

**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 135).

**Linguistics** 101, 102 (See page 135.)

## Russian

### COLLEGE OF ARTS AND SCIENCES

Associate Professor Nalibow; Assistant Professor McKenna.

**1-2 Elementary Russian** Four hours each course. McKenna, Nalibow.

**11, 12 Intermediate Russian** *Prerequisite:* 1-2. Four hours each course. McKenna, Nalibow.

**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:* 11, 12. 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:* 11, 12. Three hours each course. McKenna, Nalibow.

**193, 194 College Honors**

**195, 196 Special Topics**

**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 language. 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** Required of all senior concentrators. Three hours each course. McKenna, Nalibow. (Not offered for graduate credit.)

#### 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, McKenzie; Associate Professors Burrell, Paolucci-Whitcomb, Rathbone-McCuan (Coordinator), Thompson; Assistant Professors DeWeaver, McEntee, Rose.*

**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.

**6 Participation** Designed so content and structure may accommodate special issues in social work not especially appropriate within boundaries of an existing course. Three hours. (Optional).

**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 of coordinator; 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 Social Work major or permission of coordinator; 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 Social Work major or permission of coordinator. Three hours.

**291, 292 Senior Seminar** Weekly seminar for social work majors to examine issues in social work practice. *Prerequisites:* Senior standing, Social Work majors. Three hours.

## Sociology (SOC)

### COLLEGE OF ARTS AND SCIENCES

*Professors Folta (Chairperson), G. Lewis, W. Lewis, Loewen, Mabry, Nixon, Sampson, Stanfield, Steffenhagen; Associate Professors Danigelis, Fengler, Finney, McCann, Mintz, Schmidt; Assistant Professors Berkowitz; Instructor Fishman.*

**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. Berkowitz, Finney, Fishman, Folta, Mabry, McCann, Stanfield.

**19 Race Relations in the United States** 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.

**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, Steffenhagen.

**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, Lewis.

**36 Technology and Social Organization** Introduction to historical and comparative analysis of examples of societal evolution and change in Africa, Asia, and Latin America in relationship to Western development. Three hours. Berkowitz, McCann, Sampson.

**51 Religious Deviance, Magic, and the Occult** Analysis of the social and cultural organization of groups professing deviant spiritual, occult, mystical, and/or magical beliefs and their relationships to the institutions of society. Three hours. Sampson, Steffenhagen.

**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. Steffenhagen.

**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. Steffenhagen.

**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 Special Topics

*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. Three hours. Berkowitz, Danigelis, Finney, 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, Mabry, 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. Finney, Fishman, Folta, McCann, Stanfield.

**119 Minority Groups** 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, Fishman, 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, Fishman, Folta, Lewis, Mintz.

**125 Organizational Communications** Analysis of the organizational problems of effective internal communication, access by clients and publics, propaganda and influence, and inter-organizational 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, Folta, McCann, 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. Berkowitz, Fengler, Lewis.

**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, Nixon, Mabry, 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.

**144 Sociology of Education** Analysis of the social organization of education with special attention to the causes and consequences of educational changes in relationship to other institutions in modern society. *Prerequisite:* Three hours of sociology. Three hours. Finney, Folta, Lewis, Loewen.

**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 non-work 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 Special Topics**

**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. Mabry, 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. Lewis, 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 non-verbal aspects of self-disclosure, listening, coping, conflict, and therapeutic interaction. *Prerequisite:* 141 or nine hours of sociology. Three hours.

**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, Steffenhagen.

**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, Finney, Folta, Schmidt, Stanfield.

**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. Folta, McCann.

**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, 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 sub-cultures and social structures, and responses to racial prejudice and discrimination. *Prerequisite:* Six hours of sociology. Three hours. Danigelis, Fishman, Loewen.

**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, Folta, 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. Berkowitz, Fengler, Folta, Lewis, Mabry.

**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, Mabry, 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, Finney, Nixon, Loewen, Mintz.

**241 Methods of Public Opinion Research** (Same as Political Science 284.)\* Methods used in conducting public opinion research, emphasizing design, sampling, questionnaire construction, administration, data control, and analysis of cross-sectional, longitudinal, and time series data. *Prerequisites:* 100 (Political Science 183) or equivalent with permission of instructor. Three hours. Berkowitz, Danigelis.

**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.

**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, Foltz, Mabry.

**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. Foltz, Mabry, Steffenhagen.

**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. Foltz, Stanfield.

**274 Methods of Data Gathering in Social Research** Techniques for generating and using observational, interview, survey, and existing source data to test systematically sociological ideas; includes design, sampling, measurement, and ethical issues. *Prerequisite:* 100 or equivalent with permission of instructor. Three hours. Berkowitz, Danigelis, Finney, Foltz, Loewen, Sampson, 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, Finney, 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.

**279 Contemporary Sociological Theory** Critical examination of contemporary functional, conflict, exchange, interactionist, and structural theoretical approaches. A number of other theoretical approaches selected by seminar participants also examined. *Prerequisite:* 278. Three hours. Foltz, McCann, Sampson.

**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 Special Topics**

**297, 298 Readings and Research**

Haugh, Howell, Newton, Tashman; Assistant Professors Costanza, Whaley; Research Associate Professor Aleong; Research Assistant Professor McAuliffe.

**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 262; junior standing. Three hours.

**223 Statistical Methods III** 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:* 141 plus a second statistics course or 211. Some computer experience desirable. Three hours.

## Statistics (STAT)

COLLEGE OF ENGINEERING AND MATHEMATICS  
Statistics Program Steering Committee: Professor McCrorey; Associate Professors Ashikaga (Director), Gordon,

**224 Statistical Methods IV** Techniques for survey sampling (including stratification and clustering methods), industrial quality control (acceptance sampling and control charts for process control), and reliability and survival analysis. *Prerequisites:* 141 plus a second statistics course or 211. Some computer experience desirable. Three hours.

**225 Applied Regression Analysis** (Same as Business Administration 270.) Nature and applications of basic regression-correlation models in investigating relationships, testing hypotheses, and making predictions. Emphasis on developing appropriate models and evaluating existing research. *Prerequisite:* Any one of 111, 141, 211, 241, or 261; Economics 11, Math. 19 or equivalent. Three hours. No credit for graduate students in Statistics or Biostatistics.

**227 Statistical Methods for the Behavioral Sciences** (Same as Psychology 341.) *Prerequisite:* 211 with computer experience or Psychology 340.

**229 Statistical Methods for the Engineering Sciences** Multiple regression and response surface modeling, factorial design of experiments, statistical quality control. Probability distributions used in reliability and life testing. *Prerequisite:* Any one of 141, 211, 241, or 262. 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 262. 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 are 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, Erland, and Poisson distributions. Monte Carlo simulation. *Prerequisite:* 151 or 251. One hour.

**252c Applied Time Series Analysis** Autoregressive-moving average (Box-Jenkins) models, autocorrelation and partial correlation, differencing for nonstationarity, computerized data analysis. Forecasting, seasonal or cyclic variation, transfer function and intervention analysis. *Prerequisite:* Any one of 141, 211, 225, 241, 262. One hour.

**261, 262 Statistical Theory I, II** Point and interval estimation, hypothesis testing, and decision theory. Application of general statistical principles to areas such as non-parametric tests, sequential analysis, and linear models. *Prerequisites:* For 261: 151 with instructor permission or 251; for 262: 241 with instructor permission or 261. One hour for 261; four hours for 262.

**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. 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** 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. Dawson.

**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)** (Same as Business Administration 277.) 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. Roth.

## Textiles, Merchandising, and Consumer Studies (TMCS)

### COLLEGE OF AGRICULTURE

*Associate Professor Atwood; Assistant Professors Kylo, Loker, Owen, Scott, Walsh; Lecturers Ashman, Gora.*

**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.

**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.

**20 Textiles: Fiber to Fabric (2-2)** Today's fibers, fabrics, and finishes. Consumer problems and responsibilities in selection, use, and care. Three hours. Kylo.

**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. Gora.

**25 Career Seminar** Integrated look at professional aspects and opportunities available to students. Minimum of two credits required for majors. One hour.

**51 Housing and the Consumer** Considerations in selecting living environments for individuals and families including site location, financing, public policy, structural, functional, spatial, and aesthetic aspects. Three hours.

**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. Owen.

**58 Introduction to Consumer Problems** An overview of the buyer-seller relationships emphasizing consumer information and protection. Three hours. Walsh.

**107 Fashion Design and Trend Analysis (2-3)** Analysis of 20th century clothing trends and innovative designers. Creating and rendering original designs. Continuation of portfolio. *Prerequisite:* 15. Loker.

**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 Textile Design (1-4)** Application of design to fabric printing techniques. Emphasis on the use of natural and historical motifs for repeat patterns. *Prerequisites:* 16, 20, or departmental permission. Three hours. Atwood.

**116 Weaving (1-4)** Introductory course in four harness loom weaving. Application of design fundamentals to woven textiles. *Prerequisites:* 15, 20, or departmental permission; junior standing. Three hours. Atwood.

**117 History of Costume (3-0)** Costume throughout history and its interrelationship with economic, political, social, and cultural settings, emphasis on adaptations to ready-to-wear and the stage. *Prerequisite:* Art 6 or Theatre 1. Three hours.

**120 Textile Dyeing and Finishing (2-2)** Review of textile fibers; emphasis on chemical structures and properties. Interaction of dyes and finishes with textile fibers. Application of dyes and finishes to fabric. *Prerequisites:* 20, Chemistry 4 or 42. Three hours. Kylo.

**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 4 or 42. Three hours. Kylo.

**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 permission of instructor. Three hours.

**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. Scott.

**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. *Prerequisites:* 125, Business Administration 154. Three hours. Gora.

**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. Scott.

**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; junior standing. Three hours. Scott.

**153 Design for Living Interiors (1-4)** Planning interior space for function, comfort, beauty, and expression. Study of period and contemporary styles. Selection of furniture and materials. Scale renderings. *Prerequisite:* 16 or permission of instructor. Three hours.

**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.

**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.

**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. Gora. Alternate years, 1985-86.

**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. Three to six hours.

**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.)

**223 Functional Apparel Design** Analysis and evaluation of the social and physical apparel needs of various consumer groups; activities include discussion, experimentation, and design. *Prerequisite:* 122 or permission of instructor. Three hours. Loker.

**231 Advanced Workshops** Independent laboratory work. Emphasis on planning, research, management, techniques, production, and evaluation. *Prerequisite:* Completion of highest level course in concentration. May be repeated with permission of instructor. Three hours. (Not offered for graduate credit.)

**259 Home Furnishing Studio** Aesthetic and practical problems in design, construction, or restoration of furniture or furnishings for the home. Emphasis varies with semester. Students may enroll more than once. *Prerequisite:* 15 or permission of instructor. Three hours. Lusk. (Not offered for graduate credit.)

**261 Consumer Education Seminar** Survey and analysis of programs, materials, and research in consumer information and education. *Prerequisite:* A research methodology course or six undergraduate courses in the consumer studies area. Three hours.

**97, 197, 297 Mini-Course** Short courses dealing with limited topics offered in various disciplines in home economics. Enrollment may be more than once. *Prerequisite:* Varies with course. One hour.

**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.

**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.



## Theatre (THE)

### COLLEGE OF ARTS AND SCIENCES

*Professor Feidner; Associate Professors Bryan, Schenk (Chairperson), Williams; Assistant Professors Snider, Thaler; Lecturers Smith, Rideout, Ross.*

**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. Bryan.

**5 Oral Interpretation of Literature** Performance of literature that is traditionally non-dramatic. 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.

**11 Effective Speaking** Fundamentals course in effective informative and persuasive public speaking and critical listening. Includes theory and practice. Three hours. I, II. Smith, Rideout, Ross.

**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, II. Thaler.

**41 Historic Costume for the Stage** Overview of period costume and its adaptation for the stage. Three hours. I. Thaler.

**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.

**125 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, 1984-85. Bryan.

**126 Dramatic Analysis: Style** Examination of manner in which a playwright's manipulation of parts of a drama is affected by his/her intellectual and cultural milieu and physical shape of theatre for which he/she is writing. *Prerequisites:* 1, three additional hours in theatre. Three hours. I, 1984-85. Bryan.

**127 The Classical Theatre** Earliest dramatic rituals and the theatres of Greece and Rome as evidenced by historical remains and extant dramas. *Prerequisites:* 1, three hours. I, 1984-85. Bryan.

**128 The Medieval and Renaissance Theatre** Medieval and Renaissance theatre, accompanied by an evaluation of relevant historical materials and representative dramas. *Prerequisites:* 1, three hours. Three hours. II, 1984-85. Bryan.

**129 17th and 18th Century Theatre** Dramas and theatrical conditions in Europe and America from the closing of

the English theatres to the end of the 18th century. *Prerequisites:* 1, three hours. Three hours. I, 1985-86. Bryan.

**130 19th and 20th Century Theatre** Backgrounds, theatrical conventions, and dramas representative of Romanticism, Realism, and revolts against Realism. *Prerequisites:* 1, three hours. Three hours. II, 1985-86. 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. II. Thaler.

193, 194 College Honors

195, 196 Special Topics

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.)

**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. Smith, Rideout, Ross.

**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:* Nine 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

*Professor Fuller; Associate Professors Albright, Bloom, Ferreira, S. Hasazi, Kelly, Shimel; Extension Associate Professors Harris, Moore, Patterson (Acting Chairperson), Wells; Lecturer Zimmerman.*



## AGRICULTURAL TECHNOLOGY AND INDUSTRIAL EDUCATION

**2 General Shop (1-4)** Introduction to basic materials, tools, equipment, and processes commonly employed in general shops emphasizing woodworking and metalworking. Three hours. Bloom.

**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. Zimmerman.

**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. Zimmerman.

**20 Metalworking Technology (2-2)** Common methods, processes, materials, and equipment employed in transforming 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 Founding (2-2)** Oxyacetylene, electric arc, MIG and TIG welding and the methods, processes, and equipment of basic founding. Three hours. Ferreira.

**105 Machine Tools (2-2)** Methods, processes, tools, and related equipment utilized in precision cutting and shaping of metal products. Emphasis on lathe, drill press, milling machine, and surface grinder. *Prerequisite:* 20 or permission of instructor. Three hours. Ferreira. Alternate years, 1984-85.

**110 Industrial Production (1-4)** Principles, concepts, methods employed in organizing capital, labor, tools, machines for producing identical products. Students function as labor source and mass produce a product. *Prerequisites:* 20 or 30, permission of instructor. Three hours. Ferreira. Alternate years, 1985-86.

**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. Alternate years, 1985-86.

**122 Drainage and Irrigation Lab (0-3)** Actual field design of drainage and irrigation systems for agricultural and/or recreational lands. *Prerequisite:* 121 or concurrent. One hour. Wells. Alternate years, 1985-86.

**123 Small Pond Design Lab (0-3)** Actual field design of small pond for water supply, recreation, and/or watershed runoff control. *Prerequisites:* Prerequisite or concurrent 121; knowledge of surveying desirable. One hour. Wells. Alternate years, 1985-86.

**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:* Math. 9 or 10, or permission of instructor. Three hours. Moore, Zimmerman.

**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. Moore, Zimmerman.

**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. Zimmerman.

**145 Machinery Management (2-2)** Principles of selection, operation, adjustment, replacement, preventive main-

tenance, and management of agricultural and industrial machinery based on optimum economical performance. *Prerequisites:* 6, Math. 9, or permission of instructor. Three hours. Zimmerman. Alternate years, 1984-85.

**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:* Sophomore standing. Math. 9 or 10, or permission of instructor. Three hours. Moore. Alternate years, 1984-85.

**165 Basic Electricity and Electronics (2-2)** Principles of electricity, circuits and wiring, electrical devices and controls, instrumentation, and basic electronics. *Prerequisite:* Math. 10 or permission. Three hours. Ferreira.

**170 Solar Heating Systems (3-0)** Application and design of solar systems for heating, including passive and active, for homes, greenhouses, and other buildings. *Prerequisites:* 6, 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. Harris, Snook.

**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. *Prerequisites:* Employment as a teacher in an appropriate subject, permission of department. Two hours each. Through Continuing Education. Bloom, Fuller, Harris, Snook.

**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.

**151 Methods and Procedures in Occupational and Home Economics Education (3-0)** Three modules of five weeks' duration. Laboratory management, multi-media 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. Ferreira, 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. May enroll for total of three hours. *Prerequisite:* 151. One hour for each module. Bloom.

**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 12 hours. Bloom, Ferreira, 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 (2-0) (0-1)** Presentation of information through the media of press, radio, television, and audio-visual techniques. *Prerequisite*: 52 or 82 or permission of instructor. Variable credit, two hours lecture, one hour laboratory. Fuller.

**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.

**251 Methods for Teaching Occupationally-Oriented Subjects (3-0)** Offered through Continuing Education upon request.

**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. Albright.

**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. Albright, Fuller.

**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. Albright, Hasazi.

**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.

#### 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. Students 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 Chairperson), LaBar; Assistant Professor Fuller.*

**74 Fundamentals of Wildlife Conservation** Elementary course to acquaint non-majors with historical, ecological, and administrative foundations associated with appreciative and consumptive uses of wildlife. Not open to Wildlife and Fisheries Biology majors. *Prerequisite*: Sophomore standing or instructor permission. Three hours. Fuller.

**83 Introductory Wildlife and Fisheries Seminar** Introduction to wildlife profession. Function of professional wildlife biologists in society. Introduction to topics concerning wildlife populations, legislation, administration, and management. Preference to Wildlife and Fisheries Biology majors. One hour. Capen.

**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*: 132; preference to Wildlife and Fisheries Biology majors. Two hours. Capen.

**150 Wildlife Habitat and Population Measurements** Surveys, mapping, and remote sensing techniques applied to measuring habitat variables and estimating population parameters. Two weeks in summer. *Prerequisites*: Biology 1 and 2 or equivalent, Forestry 5 or Botany 109, Statistics 141. Two hours. Fuller, 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. Capen.

**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. Fuller.

**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.

**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.

**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, 1984-85.

**251 Wildlife Habitat and Population Analysis** Analysis of animal census and survey data; population structure; survival and mortality; habitat utilization; and habitat classification. *Prerequisites:* 150, Forestry 140. Two hours. Capen.

**264 Nongame Wildlife Management** Selected topics which emphasize nongame birds and mammals: endangered species, vertebrate pests, urban wildlife, specialized survey and management practices. *Prerequisite:* 174. Three hours. Capen.

**271 Wetlands Ecology and Marsh Management (3-0)** 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.

**273 Wetlands Ecology and Marsh Management (0-4)** 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.

**274 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:* 151, 174, courses in ornithology and mammalogy. Four hours. 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, Glade, Happ (Chairperson), Heinrich, Henson, Potash; Associate Professors Davison, Kilpatrick, Landesman, Stevens; Assistant Professors Herbers, Penny-packer, Schall, VanHouten, Wilson; 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. *Prerequisite:* 1 for 2. Four hours.<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. *No prerequisite.* Three hours. Schall.<sup>1</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 man. Three hours. II. Potash.

**101 Genetics** Structural basis of inheritance; gene mutations; chromosomal aberrations; genes and enzymes; gene action in differentiation; genetics of populations; non-chromosomal inheritance. *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. Herbers.

**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. Alternate years, 1985-86. Schall.

**205 Advanced Genetics Laboratory (0-6)** Laboratory experiments designed to give students experiences with prokaryotic and eucaryotic systems in classical and modern molecular procedures. Gathering and analysis of genetic data emphasized. *Prerequisite:* 101 or instructor's permission. Two hours. II. VanHouten.

<sup>1</sup>Credit not given for both Biology 1, 2 and Botany 4, or Zoology 9. Credit not given for both Biology 1, 2 and Biology 3. Biology, Botany, and Zoology majors will not receive credit for Biology 3.

**ZOOLOGY (ZOOL)**

**9 Introductory Zoology** Principles of zoology from cellular to organismal level, including animal diversity, elementary genetics, evolutionary biology, and the relationship between form and function of the vertebrate. Four hours. Stevens.<sup>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. Pennypacker.

**193, 194 College Honors****195, 196 Special Topics**

**197, 198 Undergraduate Research** Individual laboratory research under guidance of faculty member. *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

<sup>2</sup>This course is not intended for students who plan to become Biology or Zoology majors but may be taken by transfer students who have already taken a semester of botany. Credit not allowed for both Zoology 9 and Biology 1, 2.

data. Statistics not treated. *Prerequisite*: At least one intermediate level course in biology, Math. 9, or permission of instructor. Three hours. I. Davison.

**208 General Entomology (2-4)** Morphology, physiology, and evolution of insects. *Prerequisite*: 104 or Biology 102. Four hours. Bell. Alternate years, 1984-85.

**209 Field Zoology (2-4)** Collection and identification; study of local habitats, their nature, and adaptations to them; factors governing distribution; methods of preparing study specimens. *Prerequisite*: 104 or Biology 102. Four hours. Bell.

**211 Embryology (2-4)** Principles exemplified by typical invertebrate and vertebrate embryos. *Prerequisite*: 104. Four hours. Glade.

**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. Glade, 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, behavior, and distribution. *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, 1985-86.

**222 Experimental Embryology (2-6)** Theoretical approach based on research in embryology, genetics, physiology, bacteriology, and related fields. *Prerequisites*: 211, departmental permission. Four hours. Glade. Alternate years, 1984-85.

**223 Biochemical Embryology** Biochemical and structural differentiation of cells and tissues during oogenesis and embryogenesis. *Prerequisites*: 101, 211. A course in biochemistry recommended. Three hours. II. Landesman. Alternate years, 1985-86.

**225 Environmental Physiology (2-4)** Processes by which animals cope with moderate, changing, and extreme environments. *Prerequisites*: Biology 102, 104. Four hours. 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. Pennypacker. Alternate years, 1984-85.

**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.

**250 Invertebrate Zoology (2-4)** Anatomy, physiology, and life histories of representatives of the more important phyla. Four hours. Henson.

**251 Insect Structure and Function (3-3)** Anatomy and physiology emphasizing growth, reproduction, and sensory physiology. *Prerequisite*: 104 or consent of instructor. Four hours. Happ. Alternate years, 1985-86.

**255 Comparative Animal Physiology (2-6)** General principles of function in invertebrates and vertebrates. *Prerequisites*: 104, Chemistry 141, 142. Four hours. II. Davison.

**262 Biological 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 Modern Evolutionary Theory** Contributions of modern research in genetics, systematics, distribution, experimental embryology, serology, and related fields to problems of evolutionary change. *Prerequisite*: Biology 101 (Biology 102 recommended). Three hours. Kilpatrick. Alternate years, 1984-85.

**271 Advanced Limnology** Analyses of current concepts and problems. *Prerequisite*: 236. Four hours. II. Henson.

**281 through 283 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 Special Topics**



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Harriet Pearson Dustan, M.D.  
Florence Cudworth Holden, B.A.  
Harry Robert Mitiguy, B.S., M.S.  
Kerry Lynn Ann Percy

*Birmingham, Alabama*  
*Bow, New Hampshire*  
*Shelburne, Vermont*  
*White River Junction, Vermont*

Term Ending March 1987

Edwin Adolph Colvin  
Gloria Ann Conant  
Charles Rogers Cummings, B.A., LL.B.  
John James Zampieri

*Shaftsbury, Vermont*  
*Richmond, Vermont*  
*Brattleboro, Vermont*  
*South Ryegate, Vermont*

Term Ending March 1988

Phyllis Burke Davis, B.A.  
John Theodore Fey, J.S.D.  
Angelo Peter Pizzagalli, B.S.

*New York, New York*  
*New York, New York*  
*South Burlington, Vermont*

Term Ending March 1989

Gwendolyn Tibbits Bronson  
William Allyn Gilbert, B.A., LL.B.  
Edgar May, B.S.  
Donald Alfred Moore

*Shelburne, Vermont*  
*Hinesburg, Vermont*  
*Springfield, Vermont*  
*Shrewsbury, Vermont*

Term Ending March 1990

Ray Wallace Allen, B.S.  
Frank Anderson Balch  
Robert Allan Paul, A.B., J.D.

*South Hero, Vermont*  
*Burlington, Vermont*  
*Burlington, Vermont*

## Officers of Administration

COOR, LATTIE F., Ph.D. (1976)	President
ARNS, ROBERT G., Ph.D. (1977)	Vice President for Academic Affairs
FORSYTH, BEN R., M.D. (1966)	Interim Vice President for Administration
EATON, NANCY L., M.L.S. (1982)	Director of Libraries
FORCIER, LAWRENCE K., Ph.D. (1977)	Acting Director, School of Natural Resources
FRANCIS, GERALD P., Ph.D. (1980)	Dean, Division of Engineering, Mathematics, and Business Administration; and Dean, College of Engineering and Mathematics
JEWETT, JOHN G., Ph.D. (1977)	Dean, College of Arts and Sciences
LAWSON, ROBERT B., Ph.D. (1966)	Associate Vice President for Research and Dean, Graduate College
LUGINBUHL, WILLIAM H., M.D. (1960)	Dean, Division of Health Sciences, and Dean, College of Medicine
McCROREY, H. LAWRENCE, Ph.D. (1966)	Director, School of Allied Health Sciences
MILLIGAN, JEAN B., Ed.D. (1953)	Director, School of Nursing
MISER, KEITH M., Ed.D. (1971)	Associate Vice President for Administration and Dean of Students
REIDEL, CARL H., Ph.D. (1972)	Director, Environmental Program
SHIMEL, WILLIAM A., Ph.D. (1978)	Director, Extension Service
SINCLAIR, ROBERT O., Ph.D. (1965)	Dean, College of Agriculture
TESCONI, CHARLES A., JR., D.Ed. (1978)	Dean, College of Education and Social Services
THIMM, ALFRED L., Ph.D. (1981)	Director, School of Business Administration

## Emeriti Faculty

- Abajian, John, Jr., M.D.  
*Professor of Anesthesiology*
- Allen, Sinclair T., Jr., M.D.  
*Professor of Medicine*
- Amidon, Ellsworth L., M.D.  
*Professor of Medicine*
- Ansbacher, Heinz, Ph.D.  
*Professor of Psychology*
- Arnold, Earl Lee, Ph.D.  
*Professor of Agricultural Engineering*
- Bailey, Florence Emily, M.S.  
*Professor of Home Economics*
- Bandel, Betty, Ph.D.  
*Professor of English*
- Barney, Bernard B., M.D.  
*Associate Professor of Surgery*
- Barrett, Evaline I., M.S.  
*Associate Professor of Professional Nursing*
- Bennett, Howard Gordon, A.M.  
*Professor of Music*
- Blair, Alice J., B.S.  
*Extension Associate Professor in Extension Service*
- Bliss, Francis R., Ph.D.  
*Professor of Classics*
- Bogorad, Samuel N., Ph.D.  
*Frederick M. and Fannie C.P. Corse Professor of English Language and Literature*
- Brown, Constance Lorraine, M.S.  
*Associate Professor of Chemistry*
- Buxton, Beatrice F., M.S.  
*Extension Associate Professor in Extension Service*
- Caldwell, Martha M., M.S.  
*Associate Professor of Textiles, Merchandising, and Consumer Studies*
- Carrigan, Joseph Edward, A.M., LL.D.  
*Dean, College of Agriculture and Home Economics*
- Chambers, Alfred H., Ph.D.  
*Professor of Physiology and Biophysics*
- Chittick, Rupert Addison, M.D.  
*Professor of Psychiatry*
- Colburn, Francis P., Ph.B.  
*Professor of Art*
- Corey, William M., M.S.  
*Extension Professor in Extension Service*
- Crooks, George, Ph.D.  
*Professor of Chemistry*
- Daggett, Malcolm Daniel, Ph.D.  
*Professor of Romance Languages*
- Davison, Robert P., M.E.  
*Extension Professor in Extension Service*
- Doll, Charles George, Ph.D.  
*Professor of Geology*
- Donaghy, Raymond M.P., M.D.  
*Professor of Neurosurgery*
- Doremus, Henry M., D.V.M.  
*Associate Professor of Animal Pathology*
- Dowe, Thomas W., Ph.D.  
*Professor of Animal Sciences*
- Duchacek, Howard, M.S.  
*Professor of Mechanical Engineering*
- Dumville, Robert W., B.A.  
*Extension Assistant Professor in Extension Service*
- Dunihue, Fred W., Ph.D.  
*Professor of Anatomy*
- Dwork, Julius S., Ph.D.  
*Associate Professor of Mathematics*
- Dykhuizen, George, Ph.D., Litt. D.  
*James Marsh Professor of Intellectual and Moral Philosophy*
- Eastman, Oliver Newell, M.D.  
*Professor of Gynecology*
- Eddy, Dwight K., M.E.E.  
*Extension Professor of Agricultural and Resource Economics*
- Farr, Gordon W., M.E.A.E.  
*Extension Associate Professor in Extension Service*
- Flanagan, Theodore R., Ph.D.  
*Extension Associate Professor of Plant and Soil Science*
- Foote, Murray W., Ph.D.  
*Associate Professor of Microbiology and Biochemistry*
- Foulds, Raymond T., Jr., M.E.  
*Extension Professor in Extension Service*
- Friedman, Edward E., M.D.  
*Professor of Family Practice*
- Gallagher, Fred William, Ph.D.  
*Professor of Medical Microbiology*
- Gillies, Ellen M., B.L.S.  
*Library Professor*
- Goodhouse, Edward W., B.S.  
*Extension Associate Professor in Extension Service*
- Gould, Nathaniel, M.D.  
*Associate Professor of Orthopaedics and Rehabilitation*
- Gregg, Donald C., Ph.D.  
*Pomeroy Professor of Chemistry*
- Greif, Edwin C., M.S.  
*Professor of Business Administration*
- Grime, Philip K., M.E.A.E.  
*Extension Professor in Extension Service*
- Handelsman, Morris, Ph.D.  
*Professor of Electrical Engineering*
- Henderson, Donald Cedric, M.S.  
*Associate Professor of Poultry Science*
- Hopp, Susan M., M.Ed.  
*Research Associate Professor, College of Agriculture*
- Horton, Chesley P., M.E.  
*Extension Assistant Professor in Extension Service*
- Houston, Charles S., M.D.  
*Professor of Epidemiology and Environmental Health*
- Huber, Robert Bruce, Ph.D.  
*Edwin P. Lawrence Forensic Professor of Speech*
- Hughes, Muriel Joy, Ph.D.  
*Professor of English*
- Izzo, Joseph A., Ph.D.  
*Professor of Mathematics*
- Jewett, Silas H., B.S.  
*Extension Assistant Professor in Extension Service*
- Johnston, Stuart, Ph.D.  
*Professor of Romance Languages*



- Johnstone, Donald B., Ph.D.  
*Professor of Microbiology and Biochemistry and  
Medicine Microbiology*
- Julow, Roy G., Ph.D.  
*Associate Professor of Romance Languages*
- Kahn, Harry H., M.A.  
*Professor of German*
- Kebabian, Paul B., B.A.  
*Library Professor*
- Keller, Jay E., M.D.  
*Associate Professor of Surgery*
- Kidder, George Vincent, Ph.D., L.H.D.  
*Professor of Classical Languages and Dean of College  
of Arts and Sciences*
- Kinnard, Douglas, Ph.D.  
*Professor of Political Science*
- Kinsey, David L., Ph.D.  
*Associate Professor of Music*
- Knowles, Esther L., M.S.  
*Associate Professor of Housing and Residential  
Environment*
- Kristiansson, Karin, M.A.  
*Extension Professor in Extension Service*
- Kundert, Elizabeth, M.D.  
*Assistant Professor of Clinical Psychiatry*
- Lathrop, Frank D., M.D.  
*Associate Professor of Otolaryngology*
- Leamy, William P., M.S.  
*Extension Associate Professor of Animal Sciences*
- Lepeschkin, Eugene, M.D.  
*Professor of Medicine*
- Lidral, Frank W., Ph.D.  
*Professor of Music*
- Little, George T., Ph.D.  
*Professor of Political Science*
- Little, John E., Ph.D.  
*Professor of Microbiology and Biochemistry*
- Lochhead, John Hutchinson, Ph.D.  
*Professor of Zoology*
- Lucarini, Carl, A.M.  
*Assistant Professor of Chemistry*
- Luse, Eleanor, Ph.D.  
*Professor of Speech*
- Maeck, John V., M.D.  
*Professor of Obstetrics and Gynecology*
- Magee, Francis, M.S.N.  
*Assistant Professor of Professional Nursing*
- Martinek, Frank, Ph.D.  
*Professor of Mechanical Engineering*
- Maybury, Sally Berry, Ed.D.  
*Associate Professor of Commerce and Economics*
- McCormick, Thomas J., M.E.E.  
*Extension Professor in Extension Service*
- Melville, Donald B., Ph.D.  
*Professor of Biochemistry*
- Mercia, Leonard S.  
*Extension Professor in Extension Service*
- Meserve, Bruce E., Ph.D.  
*Professor of Mathematics*
- Milbank, Reginald Venn, M.S.  
*Professor of Civil Engineering*
- Miller, Donald B., M.D.  
*Associate Professor of Thoracic and Cardiac Surgery*
- Mills, Isabel Clark, M.A.  
*Associate Professor of Art*
- Moody, Paul Amos, Ph.D.  
*Howard Professor of Natural History and Professor of  
Zoology*
- Morse, Ellen Hastings, Ph.D.  
*Professor of Nutrition*
- Munger, Bethia N., B.S.  
*Extension Associate Professor in Extension Service*
- Newhall, Chester Albert, M.D.  
*Thayer Professor of Anatomy*
- Newlander, John Alvin, Ph.D.  
*Professor of Animal and Dairy Science*
- Nicholson, George Hubert, M.A.  
*Associate Professor of Mathematics*
- Nyquist, Elbert A., M.S.  
*Professor of Business Administration*
- Oakley, Lena Raub, M.A.  
*Associate Professor of Nursing*
- Paganuzzi, Paul N., Ph.D.  
*Professor of Russian*
- Pappoutsakis, Ippocrates, M.Mus.  
*Professor of Music*
- Paquette, Lucien D., M.Ed.  
*Extension Professor in Extension Service*
- Parker, Malcolm S., D.M.L.  
*Associate Professor of Romance Languages*
- Petrusich, Mary M., Ph.D.  
*Professor of Human Development Studies*
- Phillips, C. Alan, M.D.  
*Professor of Medicine*
- Pope, Willard Bissell, Ph.D.  
*Frederick M. and Fannie C.P. Corse Professor  
of English Language and Literature*
- Post, Archibald Thomson, Ed.M.  
*Associate Professor of Physical Education for Men*
- Powell, Agnes T., M.S.  
*Associate Professor of Human Nutrition and Foods*
- Putnam, Herbert Everett, Ph.D.  
*Associate Professor of History*
- Quinby, Phyllis Melville, B.S.  
*Associate Professor of Dental Hygiene*
- Raynor, Louise Adele, Ph.D.  
*Associate Professor of Botany*
- Riggs, Heath K., Ph.D.  
*Professor of Mathematics*
- Rowell, Lyman S., M.S., L.H.D.  
*President and Associate Professor of Zoology*
- Schoonmaker, N. James, Ph.D.  
*Professor of Mathematics*
- Schultz, Harold S., Ph.D.  
*Professor of History*
- Schumacher, George A., M.D.  
*Professor of Neurology*
- Simon, Morris L., M.A.  
*Associate Professor of Political Science*
- Sims, Ethan A. H., M.D.  
*Professor of Medicine*
- Slavin, William J. M.D.  
*Professor of Obstetrics and Gynecology*
- Sproston, Thomas Jr., Ph.D.  
*Professor of Botany*
- Squire, Horace H., Ph.D.  
*Associate Professor of Business Administration*
- Stark, Ernest, M.D.  
*Professor of Pathology*
- Staron, Stanislaw J., Ph.D.  
*Professor of Political Science*
- Steele, Doris H., Ph.D.  
*Extension Professor in Extension Service*
- Stephenson, John F., M.E. Ed.  
*Extension Professor in Extension Service*
- Stone, William W., M.A.  
*Extension Professor in Extension Service*
- Strassburg, Kathleen R., M.A.T.  
*Extension Professor of Textiles, Merchandising,  
and Consumer Studies*

- Stultz, Walter Alva, Ph.D.  
*Professor of Anatomy*
- Sumner, J. William, B.S.  
*Extension Assistant Professor in Extension Service*
- Taylor, Fred H., Ph.D.  
*Professor of Botany*
- Thompson, Noah C., M.E.A.E.  
*Extension Professor in Extension Service*
- Thorpe, Marion Brown, M.S.  
*Professor of Home Economics Education*
- Treial, Karl, M.D.  
*Clinical Instructor of Psychiatry*
- Tuthill, Arthur F., M.S.  
*Professor of Mechanical Engineering*
- Ure, Helena A., M.S.  
*Associate Professor of Professional Nursing*
- Varney, Kenneth, M.S.  
*Assistant Professor of Plant and Soil Science*
- Wallman, Lester J., M.D.  
*Professor of Neurosurgery*
- Webster, Selina M., M.S.  
*Professor of Clothing, Textiles, and Design*
- Webster, Truman Marion, Ph.D.  
*Professor of German*
- Weinrich, Francis A., M.A.  
*Assistant Professor of Music*
- 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*
- Woodruff, William A., L.M.C.C.  
*Associate Professor of Psychiatry*
- Woodward, Lloyd Abram, M.S.  
*Associate Professor of Physics*
- Young, William Greenhill, 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.*

- Aalto, Sergei K., Ph.D. (1984)  
*Visiting Associate Professor of Mathematics*
- Abajian, John C., M.D. (1974)  
*Associate Professor of Anesthesiology*
- Abajian, Michael W., Ph.D. (1983)  
*Assistant Professor of Anesthesiology*
- Abramson, Leslie S., M.D. (1983)  
*Clinical Assistant Professor of Pediatrics*
- Abarbanel, Jack A., D.O. (1979)  
*Assistant Professor of Radiology*
- Abbott, Donald W., M.D. (1981)  
*Associate Professor of Family Practice*
- Abourjaily, George S., M.D. (1982)  
*Clinical Assistant Professor of Surgery*
- Abrams, Jerome S., M.D. (1969)  
*Professor of Surgery*
- Abruscato, Joseph A., Ph.D. (1969)  
*Professor of Professional Education and Curriculum Development*
- Absher, P. Marlene, Ph.D. (1979)  
*Research Associate Professor of Medicine*
- Absher, Richard G., Ph.D. (1968)  
*Professor of Electrical Engineering and Associate Professor of Computer Science*
- Achenbach, Thomas M., Ph.D. (1979)  
*Professor of Psychiatry and Psychology*
- Adams, Charles F., M.D. (1983)  
*Clinical Instructor of Anesthesiology*
- 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*
- Adler, Diane F., B.A. (1981)  
*Lecturer in Romance Languages*
- Adler, Kenneth, Ph.D. (1979)  
*Research Assistant Professor of Pathology*
- Agan, Robert W., M.D. (1983)  
*Clinical Instructor in Anesthesiology*
- 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 Assistant Professor in Extension Service*
- Aitken, Phil A., M.D. (1977)  
*Associate Professor of Ophthalmology*
- Albarelli, Henry P. (1969)  
*Clinical Instructor in Medical Technology*
- Albee, George W., Ph.D. (1971)  
*Professor of Psychology*
- Albertini, Richard J., M.D., Ph.D. (1972)  
*Professor of Medicine and Medical Microbiology*
- Albright, Leonard O., Ph.D. (1980)  
*Visiting Associate Professor of Vocational Education and Technology and Special Education, Social Work, and Social Services*
- Alden, Peter D., M.D. (1964)  
*Clinical Associate Professor of Medicine*
- Aleong, John, Ph.D. (1976)  
*Research Associate Professor, College of Agriculture, and Lecturer in Mathematics*
- Alexander, Alan, M.D. (1980)  
*Clinical Instructor of Obstetrics and Gynecology*
- 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)  
*Research Assistant Professor of Pathology and Lecturer in Zoology*
- Allen, Walter, M.D. (1980)  
*Clinical Associate Professor of Pediatrics*
- Alnasrawi, Abbas, Ph.D. (1963)  
*Professor of Economics*
- Alpert, Norman R., Ph.D. (1966)  
*Professor of Physiology and Biophysics*
- Altemus, L. Reed, M.D. (1981)  
*Clinical Associate Professor of Radiology*
- Alvarez, Julia A., M.A. (1981)  
*Visiting Assistant Professor of English*
- Alvarez, Richard G., M.D. (1981)  
*Assistant Professor of Orthopaedics and Rehabilitation*
- Amadon, Karen F. (1981)  
*Clinical Instructor in Radiologic Technology*
- Ambrose, Jane P., M.A. (1965)  
*Associate Professor of Music*
- Ambrose, Z. Philip, Ph.D. (1962)  
*Professor of Classics*
- Anderson, John C., Ph.D. (1983)  
*Associate Professor of Business Administration*
- Anderson, Larry G., M.D. (1981)  
*Clinical Instructor in 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, Anneliese, M.D. (1983)  
*Clinical Assistant Professor of Anesthesiology*
- Andrews, Allan A., Ph.D. (1970)  
*Associate Professor of Religion*
- Andrews, Margaret R., M.S. (1981)  
*Extension Assistant Professor in Extension Service*
- Andrews, Sara W., M.S.L.S. (1969)  
*Library Associate Professor in Dana Medical Library*
- Aranson, Albert, M.D. (1981)  
*Professor of Medicine*

- Archdeacon, Dan S., Ph.D. (1982)  
*Assistant Professor of Mathematics*
- Ariano, Marjorie A., Ph.D. (1980)  
*Assistant Professor of Anatomy and Neurobiology*
- Armstrong, Frank H., Ph.D. (1968)  
*Associate Professor of Forestry*
- Arns, Robert G., Ph.D. (1977)  
*Professor of Physics*
- Aronson, Jeffrey B., M.A. (1977)  
*Lecturer in History*
- Aronson, Richard A., M.D. (1978)  
*Clinical Assistant Professor of Pediatrics*
- Aschenbach, Walter P. (1959)  
*Lecturer in Art*
- Ashikaga, Takamaru, Ph.D. (1973)  
*Associate Professor of Mathematics*
- Ashman, Jay I., J.D. (1982)  
*Lecturer in Textiles, Merchandising, and Consumer Studies*
- Ashman, Marguerite G., B.A. (1974)  
*Extension Assistant Professor in Extension Service*
- Ashmead, Graham G., M.D. (1982)  
*Instructor in Obstetrics and Gynecology*
- Atherton, Henry V., Ph.D. (1953)  
*Professor of Animal Sciences*
- Atherton, Janet E., B.Mus. (1981)  
*Instructor in Music*
- Atwood, Elizabeth F., M.S. (1966)  
*Associate Professor of Textiles, Merchandising, and Consumer Studies*
- 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*
- Azar, Massoud, M.D. (1983)  
*Clinical Assistant Professor of Neurology*
- Babbott, David A., M.D. (1967)  
*Associate Professor of Medicine*
- Babbott, Frank L., Jr., M.D. (1963)  
*Clinical Associate Professor of Medicine*
- Bach, Michael C., M.D. (1981)  
*Clinical Assistant Professor of Medicine*
- Backus, Robert W., M.D. (1982)  
*Clinical Assistant Professor of Family Practice*
- Baker, John S., M.S. (1981)  
*Assistant Professor of Medical Technology*
- Baker, Nancy E., Ph.D. (1982)  
*Lecturer in Communication Science and Disorders*
- Baker, Roger D., M.D. (1971)  
*Clinical Instructor in Pediatrics*
- Balch, Donald J., Ph.D. (1952)  
*Professor of Animal Sciences*
- Baldini, Elio, M.D. (1983)  
*Clinical Professor of Anesthesiology*
- Baldwin, Warren, M.D. (1980)  
*Clinical Assistant Professor of Obstetrics and Gynecology*
- Ballard, Patricia R., B.A. (1982)  
*Clinical Instructor in Medical Technology*
- Bancroft, Robert L., Ph.D. (1981)  
*Assistant Professor of Agricultural and Resource Economics*
- Barasch, Robert I., Ph.D. (1977)  
*Adjunct Assistant Professor of Psychology*
- Barbour, James R., Ed.D. (1974)  
*Associate Professor of Human Development Studies*
- Barnum, H. Gardiner, Ph.D. (1965)  
*Associate Professor of Geography*
- Barrera, Richardo D., Ph.D. (1980)  
*Visiting Assistant Professor of Psychology*
- Barret, 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)  
*Assistant Professor of Human Nutrition and Foods*
- Barth, Richard A., M.D. (1981)  
*Assistant Professor of Radiology*
- Bartlett, Richmond J., Ph.D. (1958)  
*Professor of Plant and Soil Science*
- Barton, Gail M., M.D. (1983)  
*Clinical Associate Professor of Psychiatry*
- Bates, Thomas C., M.D. (1967)  
*Clinical Associate Professor of Pediatrics*
- Bates, Timothy M., Ph.D. (1974)  
*Associate Professor of Economics*
- Batt, Michael, M.D. (1981)  
*Clinical Instructor in Medicine*
- Bauer, Stephen F., M.D. (1980)  
*Clinical Assistant Professor of Pediatrics*
- Battelle, Peter E., M.B.A. (1970)  
*Assistant Professor of Business Administration*
- Bedard, Louise T. (1970)  
*Clinical Assistant Professor of Medicine*
- Beeken, Warren L., M.D. (1976)  
*Professor of Medicine*
- Beeker, Barbara A., Ed.D. (1977)  
*Professor of Professional Nursing*
- Belinson, Jerome L., M.D. (1977)  
*Associate Professor of Obstetrics and Gynecology*
- Bell, Ross T., Ph.D. (1955)  
*Professor of Zoology*
- Bell, Roy W., F.A.C.A. (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*
- Benkert, Ernst G., B.A. (1984)  
*Visiting Assistant Professor of Art*
- Bennert, Harry W., Jr., M.D. (1980)  
*Clinical Associate Professor of Obstetrics and Gynecology*
- Bennet, Eben, M.D. (1980)  
*Clinical Associate Professor of Obstetrics and Gynecology*
- Bergdahl, Dale R., Ph.D. (1977)  
*Associate Professor of Forestry*
- Bergner, Arthur, M.D. (1970)  
*Clinical Associate Professor of Medicine*
- Bergner, Renee S., M.D. (1970)  
*Clinical Professor of Pediatrics*
- Berkett, Lorraine P., M.S. (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)  
*Assistant Professor of Sociology*
- Bernstein, Elizabeth R., B.A. (1977)  
*Clinical Instructor in Psychiatry*
- Bernstein, Richard A., M.D. (1976)  
*Associate Professor of Psychiatry*
- Bertocci, Paul V., M.D. (1976)  
*Clinical Assistant Professor of Family Practice*
- Bevan, John A., M.B. (1983)  
*Professor of Pharmacology*
- Bevan, Rosemary D., M.B. (1983)  
*Associate Professor of Pharmacology*

- Bevins, Malcolm I., M.S. (1956)  
*Extension Professor of Agricultural and Resource Economics*
- Bevins, Thomas M., B.S. (1979)  
*Lecturer in Physical Therapy*
- Biddle, Arthur W., Ph.D. (1970)  
*Assistant Professor of English*
- Bidwell, Robinson, M.D. (1982)  
*Clinical Associate Professor of Surgery*
- Bigalow, Charles W., M.S. (1964)  
*Extension Associate Professor in Extension Service*
- Bigos, S. Thomas, M.D. (1981)  
*Assistant Professor of Medicine*
- Bijunas, Al B., M.S. (1983)  
*Lecturer in Chemistry*
- Bingham, Richard L., M.S.W. (1975)  
*Clinical Associate Professor of Psychiatry*
- Bishop, John S., Ph.D. (1980)  
*Clinical Associate Professor of Psychiatry*
- Bittermann, Donald E., M.D. (1981)  
*Clinical Assistant Professor of Radiology*
- Blanchard, Carol J., M.F.A. (1981)  
*Visiting Assistant Professor of Theatre*
- Bland, John H., M.D. (1949)  
*Professor of Medicine*
- Blattner, Stephen, M.D. (1982)  
*Clinical Assistant Professor of Pediatrics*
- Blinick, Joseph S., Ph.D. (1981)  
*Clinical Assistant Professor of Radiology*
- Bliss, Harry A., M.D. (1981)  
*Clinical Assistant Professor of Medicine*
- Bloom, Thomas K., Ed.D. (1973)  
*Associate Professor of Vocational Education and Technology*
- Bock, Mary Ann, M.S. (1983)  
*Adjunct Instructor in Communication Science and Disorders*
- Bodman, Andrew R., Ph.D. (1978)  
*Assistant 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. (1981)  
*Instructor in Medicine*
- Boller, Betty M., Ed.D. (1960)  
*Professor of Organizational, Counseling, and Foundational Studies*
- Bolton, Wesson D., D.V.M. (1947)  
*Professor of Animal Pathology*
- 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 Instructor in Medicine*
- Boraker, David K., Ph.D. (1969)  
*Associate Professor of Medical Microbiology*
- Borman, Linda S., Ph.D. (1982)  
*Research Assistant Professor of Pharmacology*
- Bouchard, Richard E., M.D. (1955)  
*Professor of Medicine and Family Practice*
- Boushey, Dallas R. (1966)  
*Assistant Professor of Anatomy and Neurobiology*
- Bousquet, Daniel W., M.B.A. (1975)  
*Extension Associate Professor in Natural Resources and Lecturer in Forestry*
- Bouton, Edward L. M.S. (1967)  
*Extension Professor in Extension Service*
- Bouton, Mark E., Ph.D. (1980)  
*Visiting Assistant Professor of Psychology*
- Bove, Louis G., M.D. (1981)  
*Clinical Associate Professor of Medicine*
- Bovill, Edwin G., M.D. (1982)  
*Assistant Professor of Pathology*
- Bowen, Charles R., D.M.D. (1972)  
*Clinical Assistant Professor of Oral Surgery and Instructor in Dental Hygiene*
- Bowers, David A., Ph.D. (1984)  
*Visiting Professor of Business Administration*
- Bowman, Robert J., Ph.D. (1983)  
*Associate Professor of Electrical Engineering*
- 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, Judy K., M.S. (1977)  
*Extension Associate Professor in Extension Service*
- Boyd, Marjorie A., M.D. (1981)  
*Clinical Associate Professor of Medicine*
- Boyer, Neil V., M.M. (1973)  
*Instructor in Music*
- Bradbury, Diane E., M.A. (1984)  
*Lecturer in English*
- Bradley, Anthony G., Ph.D. (1969)  
*Professor of English*
- Bradley, Patricia H., M.A. (1983)  
*Lecturer in English*
- Bradley, Walter G., D.M. (1982)  
*Professor of Neurology and Professor of Pathology*
- Brakeley, Johana K., M.D. (1981)  
*Clinical Instructor in Pediatrics*
- Branda, Richard, M.D. (1983)  
*Professor of Medicine*
- Brande, Justin, M.S. (1980)  
*Adjunct Assistant Professor of Environmental Studies*
- Braun, Theodore E., Jr., M.D.  
*Associate Professor of Obstetrics and Gynecology*
- Breen, Mary E., M.S. (1957)  
*Associate Professor of Medical Technology*
- Brenneman, Walter L., Jr., Ph.D. (1969)  
*Assistant Professor of Religion*
- Brewster, Thomas C., M.D. (1980)  
*Clinical Assistant Professor of Pediatrics*
- Briggs, Richard H., M.D. (1980)  
*Clinical Associate Professor of Pediatrics*
- 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*
- Brinkman, Carl A., M.D. (1982)  
*Clinical Assistant Professor of Surgery*
- Brittain, Stephen M., M.D. (1983)  
*Clinical Assistant Professor of Neurology*
- Britton, Richard C., M.D. (1982)  
*Professor of Surgery*
- Bronson, David L., M.D. (1977)  
*Assistant Professor of Medicine*
- Bronstein, Phyllis, Ph.D. (1981)  
*Assistant Professor of Psychology*
- Brook, Munro S., M.A. (1975)  
*Extension Professor in Extension Service*
- Brooks, George W., M.D. (1953)  
*Clinical Professor of Psychiatry*
- Broughton, T. Alan, M.A. (1966)  
*Professor of English*

- Brown, Douglas W. M.D. (1982)  
*Clinical Assistant Professor of Orthopaedics and Rehabilitation*
- Brown, Janet M., M.S. (1973)  
*Associate Professor of Professional Nursing*
- Brown, Joanne C., M.A. (1982)  
*Lecturer in Mathematics*
- Brown, John S., Jr., Ph.D. (1966)  
*Professor of Physics*
- Brown, Kenneth A., M.D. (1984)  
*Assistant Professor of Medicine*
- Brown, Patrick, M.Ed. (1979)  
*Lecturer in Organizational, Counseling, and Foundational Studies*
- Brown, Peter M., M.M. (1975)  
*Assistant Professor of Music*
- Brown, William C., M.S. (1984)  
*Professor of Military Studies*
- Browne, Allen F., M.D. (1982)  
*Assistant Professor of Surgery*
- Brubaker, Barbara J., M.A. (1983)  
*Adjunct Instructor in Communication Science and Disorders*
- Bruner, Dennis R., M.A. (1982)  
*Assistant Professor of Military Studies*
- Bryan, Frank M., Ph.D. (1976)  
*Associate Professor of Political Science*
- Bryan, George B., Ph.D. (1971)  
*Associate 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)  
*Assistant 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*
- Bull, Leonard S., Ph.D. (1981)  
*Professor of Animal Sciences*
- Bunker, Clarence E., M.D. (1968)  
*Clinical Assistant Professor of Surgery*
- Burak, Michael L., J.D. (1982)  
*Lecturer in Business Administration*
- Burchard, John D., Ph.D. (1970)  
*Professor of Psychology*
- Burchard, Sara N., Ph.D. (1977)  
*Research Assistant Professor of Psychology*
- Burczy, Sara A., B.S. (1977)  
*Extension Instructor in Extension Service*
- Burden, Charles E., M.D. (1980)  
*Clinical Assistant Professor of Pediatrics*
- Burdett, Carol A., M.Ed. (1970)  
*Lecturer in Special Education, Social Work, and Social Services*
- Burger, Charles S., M.D. (1972)  
*Clinical Assistant Professor of Medicine and Family Practice*
- Burgmeier, James W., Ph.D. (1969)  
*Associate Professor of Mathematics*
- Burke, John P., Ph.D. (1984)  
*Assistant Professor of Political Science*
- 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*
- Burrows, Phyllis B., Ph.D. (1981)  
*Assistant Professor of Psychology*
- Burt, Martha A., M.Ed. (1984)  
*Lecturer in Textiles, Merchandising, and Consumer Studies*
- Bushweller, C. Hackett, Ph.D. (1978)  
*Professor of Chemistry*
- Cain, Robert N., M.D. (1953)  
*Associate Professor of Surgery*
- Calderbank, James B., M.D. (1981)  
*Clinical Instructor in Medicine*
- Caldwell, Edgar J., M.D. (1966)  
*Associate Professor of Medicine*
- Campagna, Anthony S., Ph.D. (1965)  
*Professor of Economics*
- Campbell, Judy B., M.S. (1977)  
*Extension Assistant Professor in Extension Service*
- 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)  
*Clinical Instructor in Medicine*
- Capen, David E., Ph.D. (1976)  
*Associate Professor of Wildlife Biology*
- Carew, Lyndon B., Jr., Ph.D. (1969)  
*Professor of Animal Sciences*
- Carling, Paul J., Ph.D. (1982)  
*Clinical Assistant Professor of Psychology*
- Carlson, James A., Ph.D. (1982)  
*Assistant Professor of Business Administration*
- 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)  
*Visiting 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 Instructor in Medicine*
- Carpenter, Howard J., M.S. (1947)  
*Associate Professor of Mechanical Engineering*
- Carrano, Carl J., Ph.D. (1979)  
*Assistant Professor of Chemistry*
- Carrard, Philippe, Ph.D. (1973)  
*Associate Professor of Romance Languages*
- Carrier, Mary A., B.A. (1978)  
*Clinical Instructor in Psychiatry*
- Carroll, Ronald J., M.D. (1981)  
*Clinical Associate Professor of Medicine*
- Case, Delvyn C., Jr., M.D. (1981)  
*Clinical Assistant 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 and Civil Engineering*
- Catalano, Patrick M., M.D. (1980)  
*Assistant Professor in Obstetrics and Gynecology*
- Cats-Baril, William L., Ph.D. (1982)  
*Assistant Professor of Business Administration*

- Chabot, Aurore M., M.F.A. (1982)  
*Assistant Professor of Art*
- Chalmer, Bruce J., M.S. (1979)  
*Lecturer in Mathematics*
- Chamberlain, Erling W., Ph.D. (1962)  
*Professor of Mathematics*
- Chapman, James G., Ph.D. (1968)  
*Professor of Music*
- Charbonneau, Norbert F., M.A. (1960)  
*Lecturer in Computer Science*
- Charron-Shea, Maureen, M.S. (1983)  
*Adjunct Instructor in Communication Science and Disorders*
- Chase, Christopher R., M.D. (1977)  
*Assistant 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*
- Chaucer-Hatton, Mary, M.S.N. (1979)  
*Clinical Instructor in Obstetrics and Gynecology*
- Cheney, Arthur H., Jr., M.Ed. (1969)  
*Assistant Professor of Organizational, Counseling, and Foundational Studies*
- Chiappinelli, Emlanvele Q., M.D. (1981)  
*Clinical Instructor in Pediatrics*
- Chickering, Elizabeth J., M.S. (1980)  
*Assistant Professor of Medical Technology*
- Chiu, Jen-Fu, Ph.D. (1978)  
*Associate Professor of Biochemistry*
- Christen, Genevieve L., M.S. (1982)  
*Assistant Professor of Animal Sciences*
- Christensen, Charles, Jr., M.Ed. (1959)  
*Associate Professor of Human Development Studies*
- 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*
- Chupack, Jeanette J., M.F.A. (1983)  
*Lecturer in Textiles, Merchandising, and Consumer Studies*
- Churchill, Hugh W., Ph.D. (1983)  
*Lecturer in Botany*
- Cioffari, Annamaria T., M.A. (1982)  
*Clinical Instructor in Psychology*
- Ciongoli, Alfred K., D.O. (1978)  
*Clinical Assistant Professor of Neurology*
- Citrin, Murray M., M.A. (1982)  
*Clinical Instructor in Psychiatry*
- Claffey, Thomas F., M.D. (1981)  
*Clinical Instructor in Medicine*
- Clapp, James F., M.D. (1970)  
*Professor of Obstetrics and Gynecology*
- Clark, David E., M.D. (1983)  
*Clinical Assistant Professor of Surgery*
- 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*
- Clarke, Robert P., M.S. (1974)  
*Research Assistant Professor of Human Nutrition and Foods*
- Clausen, John C., Ph.D. (1981)  
*Research Assistant Professor of Natural Resources*
- Cleghorn, Ailie, M.A. (1983)  
*Lecturer in Organizational, Counseling, and Foundational Studies*
- Clements, Dianne B., M.S.C. (1983)  
*Lecturer in Professional Nursing*
- Clements, John P., M.D. (1969)  
*Associate Professor of Radiology and Medicine*
- Clements, Zacharie J., Ph.D. (1971)  
*Professor of Professional Education and Curriculum Development*
- Clemmons, Jackson J., M.D., Ph.D. (1962)  
*Professor of Pathology*
- Clewley, Elizabeth C., M.D. (1961)  
*Clinical Associate Professor of Pediatrics*
- Cochran, Robert W., Ph.D. (1954)  
*Professor of English*
- Coddaire, David M., M.D. (1979)  
*Clinical Assistant Professor of Family Practice*
- Coffin, Laurence H., Jr., M.D. (1969)  
*Professor of Thoracic and Cardiac Surgery*
- Coffin, Roberta R., M.D. (1977)  
*Clinical Associate Professor of Pediatrics*
- Cogen, Lewis, M.D. (1981)  
*Clinical Instructor in Medicine*
- Coghlan, Brian C., M.A. (1979)  
*Visiting Instructor in Economics*
- Cohen, Judith A., M.S. (1981)  
*Instructor in Technical Nursing*
- Cohen, Julius G., M.D. (1950)  
*Professor of Psychiatry*
- Cole, Cynthia H., M.D. (1984)  
*Assistant Professor of Pediatrics*
- Colletti, Richard B., M.D. (1974)  
*Assistant Professor of Pediatrics*
- Collier, Theodore A., M.D. (1972)  
*Clinical Assistant Professor of Medicine*
- Compas, Bruce E., Ph.D. (1981)  
*Assistant Professor of Psychology*
- Condon, Jean A., M.A. (1967)  
*Lecturer in Human Development Studies*
- Connolly, Thomas W., D.M.D. (1979)  
*Clinical Instructor in Oral Surgery*
- Conrad, David R., Ed.D. (1970)  
*Professor of Organizational, Counseling, and Foundational Studies*
- 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)  
*Associate Professor of Medicine*
- Cope, Sara K., M.D. (1980)  
*Clinical Assistant Professor of Pediatrics*
- Cope, Timothy T., M.D. (1982)  
*Clinical Instructor in Family Practice*
- Copeland, Rodney E., Ph.D. (1980)  
*Adjunct Associate Professor of Psychology*
- Cornbrooks, Carson J., Ph.D. (1982)  
*Assistant Professor of Anatomy and Neurobiology*
- Costante, Joseph F., M.S. (1976)  
*Extension Associate Professor of Plant and Soil Science*
- Costanza, Michael C., Ph.D. (1977)  
*Assistant Professor of Mathematics*

- Cote, Lucien M., B.S. (1969)  
*Clinical Instructor in Medical Technology*
- Coward, Raymond T., Ph.D. (1979)  
*Research Associate Professor in Center for Rural Studies and Professor of Special Education, Social Work, and Social Sciences*
- Cox, Paul M., Jr., M.D. (1981)  
*Associate Professor of Medicine*
- Craighead, John E., M.D. (1968)  
*Professor of Pathology*
- Crane, Lawrence, M.D. (1982)  
*Clinical Assistant Professor of Orthopaedics and Rehabilitation*
- Crane, Nancy B., M.S. (1969)  
*Library Associate Professor in Bailey/Howe Library*
- Crichfield, Grant, Ph.D. (1968)  
*Associate Professor of Romance Languages*
- Crimmins, Richard A., M.B.A. (1983)  
*Extension Instructor in Business Administration*
- Cronin, Mary J., M.S. (1970)  
*Associate Professor of Professional Nursing*
- Cröse, Ruth A., (1982)  
*Clinical Instructor in Family Practice*
- Cross, Harold D., M.D. (1971)  
*Clinical Associate Professor of Medicine and Family Practice*
- Cross, James M., B.S. (1964)  
*Instructor in Human Development Studies*
- Cross, Robert M., M.D. (1972)  
*Clinical Instructor in Medicine*
- Crouch, Milton H., M.S. (1969)  
*Library Professor in Bailey/Howe Library*
- Crowell, Albert D., Ph.D. (1955)  
*Professor of Physics*
- Culver, Jimmy L., D.D.S. (1976)  
*Clinical Instructor in Surgery*
- Cunningham, Daniel J., (1972)  
*Clinical Instructor in Radiologic Technology*
- Curci, Michael R., M.D. (1982)  
*Clinical Assistant Professor of Surgery*
- Currier, William W., Ph.D. (1977)  
*Associate Professor of Microbiology and Biochemistry*
- Cutler, Stephen J., Ph.D. (1984)  
*Bishop Robert F. Joyce Distinguished University Professor of Gerontology*
- Cutroneo, Kenneth R., Ph.D. (1976)  
*Associate Professor of Biochemistry*
- Czechut, Mark, M.A. (1980)  
*Professor of Military Studies*
- Czerniawski, Florence, B.A. (1967)  
*Instructor in Medical Technology*
- Dale, Rosemary L., Ed.D. (1976)  
*Adjunct Assistant Professor of Professional and Technical Nursing*
- Dall, Richard W., M.S. (1983)  
*Lecturer in Civil Engineering*
- Danforth, Elliott, Jr., M.D. (1970)  
*Professor of Medicine*
- Daniels, Robert V., Ph.D. (1958)  
*Professor of History*
- Danielson, Carol B., M.S.N. (1982)  
*Lecturer in Professional Nursing*
- Danielson, Paul A., D.M.D. (1978)  
*Clinical Instructor in Oral Surgery*
- Danielson, Ursel, M.D. (1972)  
*Clinical Assistant Professor of Psychiatry*
- Danigelis, Nicholas L., Ph.D. (1975)  
*Associate Professor of Sociology*
- Davis, Elizabeth, M.Ph. (1972)  
*Adjunct Assistant Professor of Professional Nursing*
- 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*
- 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*
- Davy, John R., M.D. (1981)  
*Clinical Instructor in Medicine*
- Dawson, Robert F., Ph.D. (1969)  
*Professor of Civil Engineering and Computer Science*
- Deane, Robert S., M.B. (1967)  
*Associate Professor of Anesthesiology*
- Deck, Edith F., M.S. (1969)  
*Associate Professor of Professional Nursing*
- DeHayes, Donald H., Ph.D. (1977)  
*Associate Professor of Forestry*
- Delehanty, Mary J., M.S. (1976)  
*Lecturer in Physical Therapy*
- Delozier, Howard L., M.D. (1978)  
*Assistant Professor of Otolaryngology*
- Demers, Louise A., M.S. (1960)  
*Associate Professor of Professional Nursing*
- Demeules, James E., M.D. (1972)  
*Associate Professor of Surgery*
- Demicco, Deborah D., M.D. (1983)  
*Instructor in Medicine*
- Deming, Howard R., M.D. (1981)  
*Clinical Associate Professor of Radiology*
- DeMoss, Harold L., M.D. (1982)  
*Clinical Instructor in Family Practice*
- Dennison, W. Landon, Jr., M.D. (1970)  
*Clinical Associate Professor of Medicine*
- Dente, Gino A., M.D. (1950)  
*Professor of Anesthesiology*
- 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*
- DeWeaver, Kevin L., Ph.D. (1980)  
*Assistant Professor of Special Education, Social Work, and Social Services*
- Dibbins, Albert W., M.D. (1982)  
*Clinical Associate Professor of Surgery*
- 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)  
*Associate Professor of Radiology*
- Dietzel, Cleason S., Ph.D. (1971)  
*Clinical Assistant Professor of Psychology*



- Dillihunt, Richard C., M.D. (1982)  
*Clinical Associate Professor of Surgery*
- Dinitz, Jeffrey H., Ph.D. (1980)  
*Assistant Professor of Mathematics*
- Doane, Heike A., Ph.D. (1977)  
*Associate Professor of German*
- Dodge, Carroll W., Ph.D. (1970)  
*Visiting Professor of Botany*
- Dodge, Richard K., M.S. (1981)  
*Lecturer in Mathematics*
- Does, Richard B., Ph.D. (1969)  
*Clinical Assistant Professor of Psychology*
- Doil, Kenneth L., M.D. (1980)  
*Clinical Assistant Professor of Obstetrics and Gynecology*
- Donahue, David W., B.S. (1982)  
*Assistant Professor of Military Studies*
- Donegan, Desmond J., M.B. (1983)  
*Clinical Assistant Professor of Cardiology*
- Donnellan, La Rae M., M.A. (1975)  
*Extension Associate Professor in College of Agriculture*
- Donnelly, Catherine W., Ph.D. (1983)  
*Visiting Assistant Professor of Animal Sciences*
- Donnelly, John R., Ph.D. (1969)  
*Associate Professor of Forestry*
- Donnelly, L. Scott, Ph.D. (1983)  
*Adjunct Assistant Professor of Animal Sciences*
- Doolan, Barry L., Ph.D. (1970)  
*Assistant Professor of Geology*
- Dopp, Sarah L., B.S. (1977)  
*Clinical Instructor in Medical Technology*
- Dorsey, Judy L., B.S. (1977)  
*Extension Assistant Professor in Extension Service*
- Dorsk, Brian M., M.D. (1981)  
*Clinical Assistant Professor of Medicine*
- Doton, Linda R., B.S. (1981)  
*Extension Instructor in Extension Service*
- 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 Instructor in Pediatrics*
- Dube, Normand C., Ph.D. (1983)  
*Lecturer in Professional Educational and Curriculum Development*
- Ducharme, Edward R., Ed.D. (1973)  
*Professor of Organizational, Counseling, and Foundational Studies*
- Duke, Paula M., M.D. (1984)  
*Assistant Professor of Pediatrics*
- Dummit, David S., Ph.D. (1984)  
*Assistant Professor of Mathematics*
- Dunkley, Debra A., B.S. (1978)  
*Lecturer in Human Development Studies*
- Dunkley, Thomas C., M.Ed. (1966)  
*Assistant Professor of Human Development Studies*
- 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*
- Durham, Delcie R., Ph.D. (1981)  
*Assistant Professor of Mechanical Engineering*
- Duthie, Alexander H., Ph.D. (1964)  
*Professor of Animal Sciences*
- Dyhrberg, John S., M.D. (1984)  
*Clinical Assistant Professor of Urology*
- Eastman, Richard C., M.D. (1981)  
*Assistant Professor of Medicine*
- Eaton, Nancy L., M.L.S. (1982)  
*Library Professor in Bailey/Howe Library*
- Edelman, Susan W., M.Ed. (1977)  
*Lecturer in Special Education, Social Work, and Social Services and Physical Therapy*
- Eddy, Dwight K., M.E.Ed. (1955)  
*Extension Professor of Agricultural and Resource Economics*
- Eddy, William H., JR., B.A. (1980)  
*Adjunct Assistant Professor of Environmental Studies*
- Edgerton, James A., M.E.Ed. (1955)  
*Extension Professor in Extension Service*
- Edwards, Keith, M.D. (1983)  
*Clinical Associate Professor of Neurology*
- Edwards, Margaret F., Ph.D. (1971)  
*Associate Professor of English*
- Ehrlich, Yigal H., Ph.D. (1980)  
*Research Associate Professor of Psychiatry and Biochemistry*
- Elfner, Douglas W., Ph.D., (1982)  
*Assistant Professor of Economics*
- Elkhwad, Abdalla, Ph.D. (1984)  
*Visiting Associate Professor of Pharmacology*
- Elkins, Alan M., M.D. (1980)  
*Professor of Psychiatry*
- Ellerson, R. David, M.D. (1970)  
*Clinical Instructor in Pediatrics*
- 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, Ellen K., M.S. (1981)  
*Assistant Professor of Professional Nursing*
- Emerson, Faith G., M.A. (1959)  
*Associate Professor of Professional Nursing*
- Emery, E. Stanley, III, M.D. (1970)  
*Associate Professor of Neurology and Pediatrics*
- Emery, Michael J., M.Ed. (1984)  
*Clinical Assistant Professor of Anesthesiology*
- Emmanuel, Narbeth R., Ph.D. (1981)  
*Assistant Professor in Organizational, Counseling, and Foundational Studies*
- English, Wesley J., M.D. (1982)  
*Clinical Associate Professor of Surgery*
- Erb, Clinton A., Ph.D. (1971)  
*Associate Professor of Professional Education and Curriculum Development*
- Ernest, David C., M.D. (1980)  
*Clinical Instructor in Obstetrics and Gynecology*
- Ershler, William B., M.D. (1980)  
*Assistant Professor of Medicine and Pharmacology*
- Ervin, William C., M.D. (1981)  
*Clinical Instructor in Medicine*
- Eschholz, Paul A., Ph.D. (1969)  
*Professor of English*
- Etherton, Bud, Ph.D. (1968)  
*Professor of Botany*
- Evans, John N., Ph.D. (1976)  
*Assistant Professor of Physiology and Biophysics*
- Evering, Frederick, Jr., Ph.D. (1965)  
*Professor of Electrical Engineering*
- Ewell, John T., M.E.D. (1977)  
*Lecturer in Professional Education and Curriculum Development*

- Ezekiel, Patricia A., M.S. (1981)  
*Assistant Professor of Medical Technology*
- 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*
- Fives-Taylor, Paula M., Ph.D. (1976)  
*Associate Professor of Medical Microbiology*
- Flack, Jean R., Ph.D. (1978)  
*Assistant Professor of Environmental Studies*
- 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)  
*Instructor in Music*
- Flowerdew, Richard, M.D. (1983)  
*Clinical Associate Professor of Anesthesiology*
- Flynn, Brian S., Sc.D. (1980)  
*Research Assistant Professor of Family Practice*
- Foley, Joseph C., M.D. (1954)  
*Professor of Radiology*
- Foley, Marion R., B.S. (1980)  
*Clinical Instructor in Obstetrics and Gynecology*
- Folta, Jeannette R., Ph.D. (1969)  
*Professor of Sociology*
- Fonda, Bruce J., M.S. (1980)  
*Lecturer in Anatomy and Neurobiology*
- Foot, Richard, Ph.D. (1981)  
*Associate Professor of Mathematics*
- Forcier, Lawrence K., Ph.D. (1977)  
*Associate Professor of Forestry*
- Ford, Dorothy E., M.D. (1968)  
*Clinical Associate Professor of Orthopaedics and Rehabilitation*
- Forgays, Donald G., Ph.D. (1964)  
*Professor of Psychology*
- Forgione, Rose J., M.A. (1964)  
*Associate Professor of Professional Nursing*
- Forsyth, Ben R., M.D. (1966)  
*Professor of Medicine and Associate Professor of Medical Microbiology*
- Foss, Donald C., Ph.D. (1966)  
*Professor of Animal Sciences*
- Foster, Roger S., Jr., M.D. (1970)  
*Professor of Surgery*
- Fowler, Nicholas K., M.D. (1982)  
*Clinical Instructor in Pediatrics*
- Fox, Carolyn W., M.L.I.S. (1981)  
*Library Assistant Professor in Dana Medical Library*
- 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*
- Franco, Muriel M., B.S. (1979)  
*Clinical Instructor in Medical Technology*
- Freedman, Steven L., Ph.D. (1964)  
*Associate Professor of Anatomy and Neurobiology*
- Frey, Lois M., B.S. (1977)  
*Extension Instructor in Extension Service*
- Fritz, Gary T., M.S. (1983)  
*Extension Assistant Professor in Extension Service*
- Frymoyer, John W., M.D. (1969)  
*Professor of Orthopaedics and Rehabilitation*
- Fuller, Clifford A., (1981)  
*Clinical Assistant Professor of Radiologic Technology*
- Fuller, Gerald R., Ed.D. (1968)  
*Professor of Vocational Education and Technology and Professional Educational and Curriculum Development*
- Fagan, William T., Jr., M.D. (1954)  
*Associate Professor of Urology*
- Faillace, Robert T., M.D. (1984)  
*Clinical Instructor in Medicine*
- 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. 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*
- Farnsworth, Ellen M., B.S. (1973)  
*Lecturer in Radiologic Technology*
- Farrell, Sandra M., M.S. (1968)  
*Lecturer in Human Development Studies*
- Faucette, Robert A., M.D. (1982)  
*Clinical Instructor in Pediatrics*
- Fay, Douglas P., M.S. (1953)  
*Associate Professor of Civil Engineering*
- 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, Christie K., Ph.D. (1970)  
*Associate Professor of Art*
- Fenn, Mary Ellen, M.D. (1980)  
*Clinical Instructor in Obstetrics and Gynecology*
- Ferdinand, Joseph J., Ph.D. (1982)  
*Visiting Assistant Professor of Romance Languages*
- Ferguson, John C., M.D. (1982)  
*Clinical Instructor in Family Practice*
- Ferreira, Charles W., Ph.D. (1975)  
*Associate Professor of Vocational Education and Technology*
- Fiekers, Jerome F., Ph.D. (1978)  
*Assistant 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 Instructor in Family Practice*
- Filak, Marilyn K., M.A. (1982)  
*Adjunct Instructor in Communication Science and Disorders*
- Fink, Theodore J., M.D. (1977)  
*Clinical Instructor in Medicine*
- Finney, Henry C., Ph.D. (1973)  
*Associate Professor of Sociology*
- Fischer, Loretta M., M.S.N. (1979)  
*Assistant Professor of Technical Nursing*
- Fischer, Richard M., M.S. (1982)  
*Lecturer in Natural Resources*
- Fishell, Kenneth N., Ed.D. (1971)  
*Professor of Professional Education and Curriculum Development*
- Fishman, Laura T., Ph.D. (1976)  
*Assistant Professor of Sociology*

- Fitzgerald, Carol R., M.A.T. (1977)  
*Extension Associate Professor in Extension Service*
- Fuller, Robert W., M.S. (1966)  
*Assistant Professor of Wildlife Biology*
- Fulwiler, Toby E., Ph.D. (1983)  
*Associate Professor of English*
- Gabridge, Michael G., Ph.D. (1981)  
*Adjunct Associate Professor of Pathology*
- Gade, Daniel W., Ph.D. (1966)  
*Professor of Geography*
- Gallagher, Connell B., M.S. (1970)  
*Library Associate Professor in Bailey/Howe Library*
- Gallagher, Rollin M., M.D. (1976)  
*Associate Professor of Psychiatry and Family Practice*
- Gallant, Janice M., B.S. (1980)  
*Clinical Instructor in Obstetrics and Gynecology*
- Gamelli, Richard L., M.D. (1979)  
*Assistant Professor of Surgery*
- Gans, Joseph H., V.M.D., Ph.D. (1967)  
*Professor of Pharmacology*
- Gardner, Frieda, Ph.D. (1981)  
*Lecturer in English*
- Garrett, Martha, M.S. (1978)  
*Lecturer in Professional Education and Curriculum Development*
- Gaspari, K. Celeste, Ph.D. (1981)  
*Assistant Professor of Economics*
- Gatti, James F., Ph.D. (1972)  
*Associate Professor of Business Administration*
- Gause, Ralph W., M.D. (1973)  
*Clinical Professor of Obstetrics and Gynecology*
- Gavett, Franklin P., Jr., M.S. (1979)  
*Library Assistant Professor in Bailey/Howe Library*
- Gay, Barbara T., M.L.S. (1962)  
*Library Associate Professor in Bailey/Howe Library*
- Gedeon, Shirley J., Ph.D. (1981)  
*Assistant 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)  
*Instructor in Music*
- Gibbard, Bruce A., M.D. (1981)  
*Clinical Associate Professor of Psychiatry*
- Gibbons, John F., M.D. (1981)  
*Clinical Professor of Radiology*
- 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)  
*Assistant Professor of Obstetrics and Gynecology*
- Gibson, Thomas C., M.B.B.C. (1962)  
*Professor of Medicine*
- Gilbert, Alphonse H., Ph.D. (1969)  
*Associate Professor of Agricultural and Resource Economics*
- Gilbert, Stuart, G., M.D. (1981)  
*Clinical Assistant Professor of Radiology*
- Gilleland, Brady B., Ph.D. (1957)  
*Professor of Classics*
- Gilmore, James A., Ph.D. (1975)  
*Assistant Professor of Animal Sciences*
- Gips, Carol L., M.A. (1980)  
*Lecturer in Art*
- Givertz, Bernard, M.D. (1981)  
*Clinical Assistant Professor of Medicine*
- Glade, Richard W., Ph.D. (1958)  
*Professor of Zoology*
- Gladstone, Toba, M.S. (1972)  
*Clinical Assistant Professor of Psychiatry*
- Gobin, Robert J., Ph.D. (1965)  
*Professor of Human Development Studies*
- Godsoe, John A., M.D. (1982)  
*Clinical Associate Professor of Orthopaedics and Rehabilitation*
- Goldberg, Joel M., B.A. (1982)  
*Assistant Professor of Chemistry*
- Golden, Gale H., M.S.W. (1982)  
*Clinical Assistant Professor of Psychiatry and Obstetrics and Gynecology*
- 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*
- Gomez, Antonio J., M.D. (1970)  
*Associate Professor of Neurology*
- Gomez, Carey C., M.S. (1983)  
*Adjunct Instructor in Communication Science and Disorders*
- Goodrich, John F., M.D. (1982)  
*Clinical Assistant Professor in Pediatrics*
- Gora, Irene T., B.S. (1976)  
*Lecturer in Textiles, Merchandising, and Consumer Studies*
- Gordon, Lawrence R., Ph.D. (1970)  
*Associate Professor of Psychology*
- Gordon, Robert J., Ph.D. (1979)  
*Assistant Professor of Anthropology*
- Gotlieb, Alan R., Ph.D. (1974)  
*Extension Associate Professor of Plant and Soil Science*
- Gottlieb, Charles D., M.S. (1980)  
*Adjunct Lecturer in Organizational, Counseling, and Foundational Studies*
- Gottlieb, Diane T., M.S.W. (1983)  
*Adjunct Lecturer in Organizational, Counseling, and Foundational Studies*
- Graffagnino, Jonathan, M.A. (1977)  
*Assistant Professor in Bailey/Howe Library*
- Graham, William G., M.D. (1971)  
*Professor of Medicine*
- Graman, Howard, B., M.D. (1978)  
*Assistant 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*
- Granger, Donald L., M.D. (1982)  
*Assistant Professor of Medicine*
- Grant, Barbara W., M.D. (1984)  
*Assistant Professor of Medicine*
- Grayson, Jane, Ph.D. (1979)  
*Clinical Assistant Professor of Psychiatry*
- Greaves, William G. (1982)  
*Visiting Professor of English*

- Gregory, Robert A., Ph.D. (1983)  
*Adjunct Associate Professor of Forestry*
- 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, Chris G., (1983)  
*Clinical Instructor in Medical Technology*
- 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 Associate Professor of Radiology*
- Grinnell, D. Jacque, D.B.A. (1978)  
*Professor of Business Administration*
- Grundler, Richard G., D.D.S. (1969)  
*Instructor in Dental Hygiene*
- Gubert, Kurt F., B.S. (1980)  
*Extension Instructor in Extension Service*
- Guerette, Sally C., M.S. (1969)  
*Lecturer in Human Development Studies*
- Guiduli, Robert C., M.D. (1966)  
*Clinical Associate Professor of Ophthalmology*
- Guillot, Ann P., M.D. (1979)  
*Assistant Professor of Pediatrics*
- Guitar, Barry E., Ph.D. (1976)  
*Associate Professor of Communication Science and Disorders*
- Gump, Dieter W., M.D. (1966)  
*Professor of Medicine and Medical Microbiology*
- Gundel, Walter D., M.D. (1971)  
*Associate Professor of Medicine*
- Gurdon, Michael, A., Ph.D. (1980)  
*Assistant 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*
- Gustin, Harry N., III, M.D. (1982)  
*Clinical Assistant Professor of Family Practice*
- Gutman, Stanley T., Ph.D. (1971)  
*Associate Professor of English*
- Hacker, Miles P., Ph.D. (1979)  
*Assistant 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)  
*Assistant Professor of Professional Nursing*
- Hagan, Joseph F., Jr., M.D. (1979)  
*Clinical Instructor in Pediatrics*
- Haines, Carleton R., M.D. (1950)  
*Associate Professor of Surgery*
- Hall, Mary S., Ph.D. (1968)  
*Associate Professor in English*
- Hall, Robert W., Ph.D. (1957)  
*Professor of Philosophy*
- Hall, William J., III, M.D. (1981)  
*Clinical Assistant Professor of Medicine*
- Hallett, George W., M.D. (1980)  
*Professor of Pediatrics*
- Halpern, William, Ph.D. (1969)  
*Associate Professor of Physiology and Biophysics*
- Haltom, William T., M.A. (1983)  
*Assistant Professor of Political Science*
- Hamel, Jr., Herbert E., M.D. (1983)  
*Clinical Instructor in Anesthesiology*
- Hamel-Bissell, Brenda P., Ed.D (1981)  
*Associate Professor of Professional Nursing*
- Hamer, Aline F., B.S. (1980)  
*Extension Instructor in Extension Service*
- Hamidiani, Kerin E., M.Ed. (1976)  
*Lecturer in Dental Hygiene*
- Hamrell, Burt B., M.D., Ph.D. (1968)  
*Assistant Professor of Physiology and Biophysics and Medicine*
- 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)  
*Assistant Professor of Geology*
- Hannah, Peter R., Ph.D. (1967)  
*Professor of Forestry*
- Hannemann, Joseph H., M.D. (1981)  
*Clinical Associate Professor of Radiology*
- Hansen, Chad D., Ph.D. (1978)  
*Professor of Philosophy*
- Hanson, John S., M.D. (1958)  
*Professor of Medicine*
- 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)  
*Assistant Professor of Pathology*
- Hardy, Edmund W., M.D. (1981)  
*Clinical Instructor in Medicine*
- 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*
- 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*
- Harvey, Lydia M., B.S. (1976)  
*Extension Instructor in Extension Service*
- 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*
- Hatch, Norman L., Jr., Ph.D. (1978)  
*Adjunct Professor of Geology*
- Hatton, Mary, M.S.N. (1979)  
*Clinical Instructor in Obstetrics and Gynecology*
- Haug, Larry D., Ph.D. (1975)  
*Associate Professor of Mathematics*
- Haviland, William A., Ph.D. (1965)  
*Professor of Anthropology*
- Hayes, Daniel M., M.D. (1981)  
*Clinical Instructor in Medicine*

- Hayes, Margaret E., M.S. (1966)  
*Lecturer in Human Development Studies*
- Hazard, Rowland G., M.D. (1981)  
*Assistant Professor of Medicine*
- Heaps, Richard W., M.S. (1980)  
*Lecturer in Economics*
- Heath, Barry W., M.D. (1981)  
*Clinical Instructor in Pediatrics*
- Heath, Gordon A., M.D. (1980)  
*Clinical Associate Professor of Psychiatry*
- Hebert, James C., M.D. (1982)  
*Assistant Professor of Surgery*
- Hegner, Stephen J., Ph.D. (1982)  
*Associate Professor of Electrical Engineering*
- Heilman, Richard S., M.D. (1968)  
*Professor of Radiology*
- Heims, Neil S., Ph.D. (1981)  
*Lecturer in English*
- Heinrich, Bernd, Ph.D. (1980)  
*Professor of Zoology*
- Heintz, Nicholas H., Ph.D. (1983)  
*Research Assistant Professor of Pathology*
- Held, Jean M., Ed.D. (1981)  
*Assistant Professor of Physical Therapy*
- Hemenway, David R., Ph.D. (1974)  
*Associate Professor of Civil Engineering*
- Hendley, Edith D., Ph.D. (1973)  
*Professor of Physiology and Biophysics and Psychiatry*
- Hendrix, William G., Ph.D. (1980)  
*Assistant Professor of Natural Resources*
- Henson, E. Bennette, Ph.D. (1965)  
*Professor of Zoology*
- Heny, Frank W., Ph.D. (1983)  
*Adjunct Professor of Communication Science and Disorders and English*
- Herbers, Joan M., Ph.D. (1980)  
*Assistant Professor of Zoology*
- Hermance, Clarke E., Ph.D. (1982)  
*Professor of Mechanical Engineering*
- Herst, Lawrence, M.D. (1984)  
*Clinical Associate 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)  
*Assistant Professor of Art*
- Hilberg, Raul, 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 Wildlife Biology*
- Hiser, Patricia L., B.S. (1983)  
*Lecturer in Technical Nursing*
- Hoak, John C., M.D. (1984)  
*Professor of Medicine*
- Hodgkin, William E., M.D. (1978)  
*Clinical Associate Professor of Pediatrics*
- Hoffmann, James P., Ph.D. (1983)  
*Lecturer in Botany*
- Hoffman, Paul R., Ph.D. (1977)  
*Assistant Professor of Communication Science and Disorders*
- Holland, Kenneth M., Ph.D. (1980)  
*Assistant Professor of Political Science*
- 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*
- Honnold, Robert E., Ed.D. (1974)  
*Extension Professor in Extension Service*
- Hood, Kenneth W., C.A.S. (1979)  
*Assistant Professor of Organizational, Counseling, and Foundational Studies*
- Hood, Virginia L., M.B.B.S. (1977)  
*Associate Professor of Medicine*
- Hopkins, Donald R., (1982)  
*Instructor in Military Studies*
- Hopp, Susan M., M.Ed. (1946)  
*Research Associate Professor, College of Agriculture, and Adjunct Associate Professor of Human Nutrition and Foods*
- Horbar, Jeffrey D., M.D. (1981)  
*Assistant Professor of Pediatrics*
- Horn, David E., Ph.D. (1983)  
*Visiting Professor of Chemistry*
- Horstman, Anthony J., M.D. (1973)  
*Clinical Instructor in Anesthesiology*
- Horton, Edward S., M.D. (1967)  
*Professor of Medicine*
- Hotelling, David R., M.D. (1981)  
*Clinical Instructor in Medicine*
- Houghaboom, Verle R., Ph.D. (1947)  
*Extension Professor of Agricultural and Resource Economics*
- Houghton, Martha, Ed.M. (1970)  
*Lecturer in Communication Science and Disorders*
- Howard, Paula R., B.S. (1984)  
*Instructor in Medical Technology*
- Howard, Phillip L., M.D. (1969)  
*Professor of Pathology*
- Howe, James G., M.D. (1978)  
*Assistant 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 Instructor in Medicine*
- Howland, William G., M.A. (1982)  
*Lecturer in Geography*
- Hoyme, H. Eugene, M.D. (1981)  
*Assistant Professor of Pediatrics*
- Huber, Sally A., Ph.D. (1981)  
*Research Assistant Professor of Pathology*
- Huddle, David R., M.F.A. (1971)  
*Professor of English*

- Hudspeth, Thomas R., Ph.D. (1972)  
*Assistant Professor of Environmental Studies*
- Huessy, Hans R., M.D. (1964)  
*Professor of Psychiatry*
- Huffman, Benjamin L., M.A. (1981)  
*Adjunct Assistant Professor of Environmental Studies*
- Hummel, John W., M.B. (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, Lyman C., Jr., D.Ed. (1966)  
*Professor of Professional Education and Curriculum Development*
- Hunziker, Robert J., M.D. (1963)  
*Professor of Radiology*
- Hurley, Edward D., Ph.D. (1982)  
*Adjunct Assistant Professor of Psychology*
- Husted, Gary R., M.S. (1971)  
*Research Assistant Professor of Microbiology and Biochemistry*
- Hutchinson, David, Ph.D. (1984)  
*Lecturer in Organizational, Counseling, and Foundational Studies*
- Hutton, Patrick H., Ph.D. (1968)  
*Professor of History*
- Hyde, Beal B., Ph.D. (1965)  
*Professor of Botany*
- Ibragic-McCormick, Emina M., M.Sc. (1983)  
*Lecturer in Human Development Studies*
- Irwin, Alan E., M.D. (1977)  
*Assistant Professor of Surgery*
- Irwin, Edward S., M.D. (1958)  
*Clinical Professor of Surgery*
- Isham, Betsy E., B.S. (1969)  
*Clinical Instructor in Medical Technology*
- Isler, Robert J., M.D. (1981)  
*Clinical Assistant Professor of Radiology*
- 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 Assistant 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*
- Jacobsohn, Ulrich B., M.D. (1980)  
*Clinical Assistant Professor of Psychiatry*
- Jacoby, Muriel C., M.S. (1974)  
*Lecturer in Professional Nursing*
- 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*
- Jarrett, Jon P., Ph.D. (1983)  
*Visiting Assistant Professor of Philosophy*
- Jarvis, Lynville W., M.A. (1967)  
*Extension Associate Professor in Extension Service*
- Jenkyn, Lawrence R., M.D. (1938)  
*Clinical Assistant Professor of Neurology*
- 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*
- Joffe, Justin M., Ph.D. (1969)  
*Professor of Psychology*
- Johansson, Jan E., M.A. (1976)  
*Lecturer in Mathematics*
- Johnson, Beverly K., M.N. (1983)  
*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, Joel M., III, M.D. (1982)  
*Clinical Assistant Professor of Surgery*
- Johnson, Robert J., M.D. (1971)  
*Professor of Orthopaedics and Rehabilitation*
- Johnson, Steven G., M.D. (1981)  
*Clinical Instructor in Medicine*
- Johnston, Aubrey P., Ed.D. (1981)  
*Associate Professor of Organizational, Counseling, and Foundational Studies*
- Johnston, Hugh H., M.D. (1981)  
*Associate Professor of Medicine*
- Jones, Gisela G., (1981)  
*Clinical Assistant Professor of Radiologic Technology*
- Jones, Karl F. (1981)  
*Clinical Assistant Professor of Radiologic Technology*
- Jones, Leonidas M., Ph.D. (1951)  
*Frederick M. and Fannie C.P. Corse Professor of English Language and Literature*
- Jordan, Barbara R., B.S. (1980)  
*Lecturer in Human Development Studies*
- Josefowicz, Thaddeus H., M.D. (1983)  
*Clinical Assistant Professor of Neurology*
- Kaagan, Stephen S., Ed.D. (1982)  
*Adjunct Professor of Organizational, Counseling, and Foundational Studies*
- Kadas, Zsuzsanna M., Ph.D. (1980)  
*Assistant Professor of Mathematics*
- Kangan, Stephen S., Ed.D. (1982)  
*Adjunct Professor of Organizational, Counseling, and Foundational Studies*
- Kaplan, Jeffrey M., J.D. (1983)  
*Assistant Professor of Organizational, Counseling, and Foundational Studies*
- Kapp, Bruce S., Ph.D. (1971)  
*Professor of Psychology*
- Katz, Saul, M.D. (1982)  
*Clinical Assistant Professor of Surgery*
- Kauffman, James G., M.Ed. (1981)  
*Lecturer in Human Development Studies*
- Kaupilla, Dennis M., M.S. (1983)  
*Extension Instructor in Extension Service*
- Kaye, Michael D., D.M., M.R.C.P. (1974)  
*Professor of Medicine*
- Keagle, Martha M., B.S. (1980)  
*Clinical Instructor in Medical Technology*
- Keane, Nancy J., M.L.S. (1979)  
*Library Instructor in Bailey/Howe Library*
- Keathley, Jane D., M.S. (1981)  
*Clinical Instructor in Medical Technology*
- Keaty, John M., M.S. (1984)  
*Lecturer in Computer Science*
- Keilson, Leonard M.D. (1981)  
*Assistant Professor of Medicine*
- Keleher, Kathleen C., M.P.H. (1979)  
*Clinical Instructor in Obstetrics and Gynecology*
- Kelleher, Philip C., M.D. (1963)  
*Associate Professor of Medicine*
- Kelley, Jason, M.D. (1977)  
*Associate Professor of Medicine*

- Kelly, William H., Ph.D. (1969)  
*Associate Professor of Vocational Education and Technology*
- Kenny, Stephen, D., Ph.D. (1978)  
*Assistant Professor of History*
- Kent Samuel S., Jr., Ph.D. (1981)  
*Visiting Associate Professor of Microbiology and Biochemistry*
- Kent, Stanley, M.D. (1980)  
*Clinical Professor of Obstetrics and Gynecology*
- Keogh, William J., M.A. (1978)  
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- Kessler, Marc, Ph.D. (1969)  
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- Keyssar, Alexander, M.D. (1971)  
*Clinical Associate Professor of Medicine*
- Kiernan, James H., Jr., B.S. (1981)  
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- Kilburg, Gail D., Ph.D. (1983)  
*Adjunct Assistant Professor of Communication Science and Disorders*
- Kilby, Alan E., M.D. (1983)  
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- Kilpatrick, C. William, Ph.D. (1974)  
*Associate Professor of Zoology*
- Kimura, John E., Ph.D. (1980)  
*Assistant Professor of Physiology and Biophysics*
- King, John F., M.D. (1980)  
*Clinical Assistant Professor of Psychiatry*
- Kintner, Laurel R., M.A. (1980)  
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- Kirk, Barbara C., M.A. (1982)  
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- Kjeldgaard, J. Mark, M.D. (1981)  
*Assistant Professor of Medicine*
- 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*
- Klimowski, Steven E., A.S. (1980)  
*Instructor in Music*
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- Knapp, Burton, M.D. (1981)  
*Clinical Associate Professor of Family Practice*
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- Knight, Stephen C., M.S. (1973)  
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- Knisely, Geoffrey R., M.D. (1981)  
*Instructor in Medicine*
- Knowles, John E., M.D. (1982)  
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- Knox, Arthur H., M.D. (1983)  
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- Keoniger-Donohue, Rebecca, B.S.N. (1980)  
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- Kohler, Molly M., M.A. (1976)  
*Lecturer in English*
- Koplewitz, Martin J., M.D. (1973)  
*Associate Professor of Surgery*
- Kornblith, Hilary, Ph.D., (1979)  
*Assistant Professor of Philosophy*
- Kornecki, Elizabeth H., Ph.D. (1983)  
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- Korson, Roy, M.D. (1951)  
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- Koss, Robert W., Ph.D. (1983)  
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- Kost, Larry L., M.S. (1973)  
*Lecturer in Mathematics*
- Krag, Martin H., M.D. (1981)  
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- Kramer, Mitchell B., Ph.D. (1980)  
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*Clinical Assistant Professor of Surgery*
- Krapcho, A. Paul, Ph.D. (1960)  
*Professor of Chemistry*
- Kraushaar, James M., Ph.D. (1981)  
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- Krawisz, Bruce R., M.D. (1984)  
*Assistant Professor of Pathology*
- Krawitt, Edward L., M.D. (1969)  
*Professor of Medicine*
- Kriebel, Richard M., Ph.D. (1975)  
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- Kristensen, Eva A., M.D. (1983)  
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- Kristiansen, Thomas K., M.D. (1983)  
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- Krizan, John E., Ph.D. (1962)  
*Professor of Physics*
- Kromer, Lawrence F., Ph.D. (1981)  
*Assistant Professor of Anatomy and Neurobiology*
- Krueger, John W., Ph.D. (1983)  
*Visiting Assistant Professor of History*
- Kruesi, William K., M.S. (1980)  
*Extension Instructor in Extension Service*
- Krupp, Patricia, Ph.D. (1972)  
*Associate Professor of Anatomy and Neurobiology*
- Krusinski, Paul A., M.D. (1974)  
*Professor of Medicine*
- Kuehne, Martin E., Ph.D. (1961)  
*Professor of Chemistry*
- Kuflik, Arthur, Ph.D. (1979)  
*Assistant Professor of Philosophy*
- Kuhlmann, Raymond F., M.D. (1948)  
*Clinical Professor of Orthopaedics and Rehabilitation*
- Kunin, Arthur S., M.D. (1964)  
*Professor of Medicine and Instructor in Biochemistry*
- Kunkel, John R., D.V.M. (1977)  
*Research Associate Professor of Animal Pathology*
- Kunkle, E. Charles, M.D. (1981)  
*Associate Professor of Medicine*
- Kupic, Edward A., M.D. (1966)  
*Professor of Radiology*
- Kusiak, Edward T., M.Ed. (1969)  
*Lecturer in Human Development Studies*
- Kyllo, Karen E., M.S.C.I. (1983)  
*Assistant Professor of Textiles, Merchandising, and Consumer Studies*
- LaBar, George W., Ph.D. (1976)  
*Associate Professor of Wildlife Biology*
- Labelle, Jean J., M.D. (1982)  
*Clinical Assistant Professor of Surgery*
- Laber, Gene E., Ph.D. (1968)  
*Professor of Business Administration*
- Lacasse, Iris I., (1971)  
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- Lacasse, Lloyd F., M.S. (1969)  
*Lecturer in Human Development Studies*
- Lachapelle, Rene C., Ph.D. (1974)  
*Associate Professor of Medical Technology*
- Laferriere, Mary E., M.S. (1983)  
*Lecturer in Professional Nursing*
- Laffal, Paul D., M.D. (1980)  
*Clinical Assistant Professor of Family Practice*
- Lafiandra, Robert P., M.D. (1972)  
*Clinical Instructor in Medicine*
- Lai, David C., Eng.D. (1965)  
*Professor of Electrical Engineering*
- Laible, Jeffrey P., Ph.D. (1974)  
*Associate Professor of Civil Engineering*
- Laing, Frederick M., M.S. (1953)  
*Research Associate Professor of Botany*
- Lajoie, Deborah W., B.S.Ed. (1980)  
*Extension Instructor in Extension Service*
- Lamb, Dianne H., M.E. Ed. (1973)  
*Extension Associate Professor in Extension Service*
- Lambert, Denis E., M.A.T. (1964)  
*Assistant Professor of Human Development Studies*
- Lambert, Donald H., M.D. (1983)  
*Associate Professor of Anesthesiology*
- Lambert, Lloyd M., Jr., Ph.D. (1965)  
*Professor of Physics and Electrical Engineering*
- Lambrew, Costas T., M.D. (1981)  
*Professor of Medicine*
- Lamden, Merton P., Ph.D. (1947)  
*Professor of Biochemistry*
- Lamora, Christine M., M.S. (1982)  
*Adjunct Instructor in Communication Science and Disorders*
- Lamoray, Ada R., B.S. (1972)  
*Lecturer in Dental Hygiene*
- Land, Marshall L., Jr., M.D. (1973)  
*Clinical Assistant Professor of Pediatrics*
- Landesman, Richard H., Ph.D. (1969)  
*Associate Professor of Zoology*
- Lane, Frank G., M.D. (1978)  
*Clinical Assistant Professor of Psychiatry*
- Lane, Theodore, Ph.D. (1983)  
*Clinical Assistant Professor of Psychology*
- Lang, Helene W., Ed.D. (1967)  
*Associate Professor of Professional Education and Curriculum Development*
- Lange, Janice L., M.S. (1967)  
*Lecturer in Human Development Studies*
- Langelier, Pamela E., Ph.D. (1983)  
*Clinical Associate Professor of Psychiatry*
- Lantman, John C., M.D. (1957)  
*Clinical Associate Professor of Medicine and Family Practice*
- Larned, Frederick S., M.D. (1981)  
*Clinical Assistant Professor of Medicine*
- Larson, Karin B., A.M.T. (1980)  
*Lecturer in Mathematics*
- Larson, Robert L., Ed.D. (1968)  
*Associate Professor of Organizational, Counseling, and Foundational Studies*
- Larson, Vicki, Ph.D. (1983)  
*Adjunct Professor of Communication Science and Disorders*
- Lasker, Roz D., M.D. (1983)  
*Assistant Professor of Medicine*
- Lavalette, Robert A. (1981)  
*Clinical Assistant Professor of Orthopaedics and Rehabilitation*
- Lawlor, John C., M.S. (1974)  
*Lecturer in Mathematics*
- Lawlor, Peter P., M.D. (1971)  
*Clinical Assistant Professor of Ophthalmology*
- Lawrason, Peter, M.D. (1980)  
*Clinical Instructor in Obstetrics and Gynecology*
- Lawrence, Peter, D.D.S. (1973)  
*Clinical Instructor in Oral Surgery and Instructor in Dental Hygiene*
- Lawson, Robert B., Ph.D. (1966)  
*Professor of Psychology*
- Leadbetter, Guy W., Jr., M.D. (1967)  
*Professor of Urology*
- Leary, Edward D., M.A.T. (1981)  
*Extension Instructor in Extension Service*
- Leclair, April L., B.S. (1980)  
*Extension Instructor in Extension Service*
- Lee, Kenneth R., M.D. (1979)  
*Assistant Professor of Pathology*
- Leeber, Donald A., M.D. (1981)  
*Associate Professor of Medicine*
- Leenstra, Willem R., Ph.D. (1980)  
*Assistant 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 Instructor in Medicine*
- Leitenberg, Harold, Ph.D. (1965)  
*Professor of Psychology and Clinical Professor of Psychiatry*
- Leiter, Laban, M.D. (1981)  
*Clinical Associate Professor of Medicine*
- Lenes, Joan G., M.Ed. (1978)  
*Lecturer in Professional Education and Curriculum Development*
- Lenox, Robert H., M.D. (1977)  
*Professor of Psychiatry*
- Leonard, Lawrence M., M.D. (1982)  
*Clinical Assistant Professor of Orthopaedics and Rehabilitation*
- Lepage, John C., M.D. (1983)  
*Clinical Instructor in Medicine*
- Leschey, William H., Jr., M.D. (1981)  
*Clinical Assistant Professor of Medicine*
- 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 Instructor in 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 German and Russian*
- Lewis, Gordon F., Ph.D. (1961)  
*Professor of Sociology*
- Lewis, John D., M.D. (1968)  
*Associate Professor of Obstetrics and Gynecology*
- Lewis, William J., Ph.D. (1954)  
*Professor of Sociology*
- Liebs, Chester H., M.S. (1975)  
*Associate Professor of History*
- Lind, Aulis, Ph.D. (1970)  
*Associate Professor of Geography*
- Lindsay, John J., Ph.D. (1964)  
*Associate Professor of Recreation Management*
- Linn, Audrey A., M.S. (1979)  
*Clinical Instructor in Obstetrics and Gynecology*



- Lintilhac, Philip M., Ph.D. (1976)  
*Research Assistant 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. (1982)  
*Visiting Assistant Professor of Professional Education and Curriculum Development*
- Lipson, Richard L., M.D. (1963)  
*Clinical Assistant Professor of Medicine*
- Litten, Raye Z., III, Ph.D. (1978)  
*Research Assistant Professor of Physiology and Biophysics*
- Little, Brian W., Ph.D. (1976)  
*Assistant Professor of Biochemistry*
- Little, David N., M.D. (1978)  
*Associate Professor of Family Practice*
- Livak, Joyce, Ph.D. (1966)  
*Associate Professor of Human Nutrition and Foods*
- Lobato-Barrera, Debra, Ph.D. (1980)  
*Visiting Assistant Professor of Psychology*
- Loewen, James W., Ph.D. (1975)  
*Professor of Sociology*
- Loker, Suzanne, Ph.D. (1981)  
*Assistant Professor of Textiles, Merchandising, and Consumer Studies*
- London, Marshall G., M.D. (1970)  
*Clinical Associate Professor of Medicine*
- Long, John G., D.D.S. (1978)  
*Assistant Professor of Dental Hygiene*
- Long, John G., M.D. (1979)  
*Clinical Instructor in Pediatrics*
- Long, Littleton, Ph.D. (1949)  
*Professor of English*
- Lopez, Debra A., M.D. (1983)  
*Clinical Instructor in Psychiatry*
- Lord, George P., M.D. (1981)  
*Clinical Assistant Professor of Medicine*
- Lorenz, Dennis N., Ph.D. (1980)  
*Visiting Assistant Professor of Psychology*
- Losey, Lawrence J., M.D. (1980)  
*Clinical Assistant Professor of Pediatrics*
- Lovely, David K., M.D. (1982)  
*Clinical Associate Professor of Surgery*
- Low, Elizabeth S., Ph.D. (1982)  
*Lecturer in Business Administration*
- Low, Robert B., Ph.D. (1970)  
*Professor of Physiology and Biophysics*
- Lucey, Jerold F., M.D. (1956)  
*Professor of Pediatrics*
- Ludewig, Victor W., M.D. (1973)  
*Clinical Assistant 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., M.D. (1981)  
*Clinical Assistant Professor of Pathology*
- 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 Instructor in Pediatrics*
- Lyng, Marla C., D.V.M. (1981)  
*Extension Assistant Professor in Extension Service*
- Lyon, G. Reid, Ph.D. (1983)  
*Adjunct Instructor in Communication Science and Disorders and Clinical Associate Professor of Neurology*
- Mabry, John H., Ph.D. (1963)  
*Professor of Medicine*
- MacCollom, George B., Ph.D. (1954)  
*Professor of Plant and Soil Science*
- MacDonald, Linda B., M.S. (1983)  
*Library Instructor in Bailey/Howe Library*
- MacDougal, Bruce A., M.D. (1982)  
*Clinical Assistant Professor of Surgery*
- Macey David A., Ph.D. (1984)  
*Visiting Assistant Professor of History*
- 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., F.R.C.P. (1981)  
*Clinical Assistant Professor of Medicine*
- MacPherson, Brian V., M.S. (1980)  
*Lecturer in Mathematics*
- MacPherson, Bruce R., M.D. (1974)  
*Associate Professor of Pathology*
- Maddox, David A., Ph.D. (1980)  
*Research Associate Professor of Medicine and Physiology and Biophysics*
- Madison, James F., M.D. (1964)  
*Clinical Associate Professor of Medicine*
- Madison, Joan G., M.D. (1972)  
*Clinical Instructor in Medicine*
- Magan, Elaine R., M.S. (1983)  
*Adjunct Instructor in Communication Science and Disorders*
- Magdoff, Frederick R., Ph.D. (1973)  
*Associate Professor of Plant and Soil Science*
- Magistrale, Anthony S., Ph.D. (1981)  
*Assistant Professor of English*
- 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 Assistant Professor of Orthopaedics and Rehabilitation*
- 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, Leon I., M.D. (1976)  
*Professor of Obstetrics and Gynecology*
- Mann, Robert L., M.A. (1983)  
*Visiting Instructor in German and Russian*
- Mann, William E., Ph.D. (1974)  
*Professor of Philosophy*
- Manning, Robert E., Ph.D. (1976)  
*Associate Professor of Recreation Management*
- Maracek, Kenneth C., M.L.S. (1980)  
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- Margolis, Stuart W., Ph.D. (1979)  
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- Marschke, Charles H., B.A. (1972)  
*Lecturer in Radiologic Technology*
- Marshall, Gilbert A., M.S. (1947)  
*Professor of Mechanical Engineering*
- Martel, Ronald L., Ph.D. (1980)  
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- 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)  
*Associate Professor of Religion*
- Martin, Thomas A., Jr., M.D. (1982)  
*Clinical Assistant Professor of Orthopaedics and Rehabilitation*
- Martinichio, Michael J. (1981)  
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- Mason, Anne B., Ph.D. (1984)  
*Research Assistant Professor of Biochemistry*
- Mason, Walter R., M.F.A. (1981)  
*Visiting Assistant Professor of Art*
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- Mattera, Jennifer A., A.S. (1983)  
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- Matthew, John D., M.D. (1982)  
*Clinical Instructor in Family Practice*
- Matthews, Edward C., M.D.C.M. (1980)  
*Clinical Associate Professor of Pediatrics*
- Maughan, David W., Ph.D. (1976)  
*Research Associate Professor of Physiology and Biophysics*
- Maxwell, Robert A., Ph.D. (1962)  
*Visiting Professor of Pharmacology*
- 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*
- McAfee, Robert E., M.D. (1982)  
*Clinical Assistant Professor of Surgery*
- McAree, Christopher P., M.B.C.H. (1962)  
*Associate Professor of Psychiatry*
- McAuliffe, Timothy L., Ph.D. (1981)  
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- McCann, B. Cairbre, M.B.B.C. (1981)  
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- McCann, Eithne C., M.B.B.C. (1981)  
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- McCann, Eugene, M.D. (1980)  
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- McCann, Harold G., Ph.D. (1974)  
*Associate Professor of Sociology*
- McCarren, V. Louise, J.D. (1983)  
*Lecturer in Business Administration*
- McCarthy, Edward A., Jr., M.D. (1980)  
*Clinical Assistant Professor of Psychiatry*
- McCarthy, Kathy A. (1981)  
*Clinical Instructor in Radiologic Technology*
- McConaughy, Stephanie H., Ph.D. (1981)  
*Research Assistant Professor of Psychiatry*
- McCormack, John J., Jr., Ph.D. (1966)  
*Professor of Pharmacology*
- McCormick, Rodney V., Ph.D. (1984)  
*Lecturer in Mathematics*
- McCormick, Thomas E., J.D. (1980)  
*Lecturer in Business Administration*
- McCracken, Brian H., M.D., M.B.B.C. (1972)  
*Clinical Professor of Medicine*
- McCran, Donald J., Jr., M.D. (1980)  
*Clinical Assistant Professor of Obstetrics and Gynecology*
- McCrorey, H. Lawrence, Ph.D. (1966)  
*Professor of Physiology and Biophysics*
- McCuan, Eloise R., Ph.D. (1982)  
*Associate Professor of Special Education, Social Work, and Social Services*
- McDay, John B., M.D. (1980)  
*Assistant Professor of Radiology*
- McDowell, David B., M.D. (1975)  
*Clinical Assistant Professor of Obstetrics and Gynecology*
- McEntee, Harry J., Ph.D. (1970)  
*Assistant Professor of Special Education, Social Work, and Social Services*
- McEvoy, Thomas J., M.S. (1981)  
*Extension Assistant Professor in School of Natural Resources*
- McFaul, Richard C., M.D. (1980)  
*Clinical Associate Professor of Pediatrics*
- McFeeters, Donald J., M.S. (1963)  
*Extension Professor in Extension Service*
- McGill, J. Bishop, M.D. (1952)  
*Associate Professor of Surgery*
- McGovern, Constance M., Ph.D. (1980)  
*Assistant Professor of History*
- McIntosh, Barbara, Ph.D. (1984)  
*Assistant Professor of Business Administration*
- McIntyre, Donald R., M.D. (1981)  
*Clinical Assistant Professor of Medicine*
- McIntyre, Lynda R., Ed.D. (1978)  
*Assistant Professor of Art*
- McKay, Robert J., M.D. (1950)  
*Professor of Pediatrics*
- McKechnie, Jeffrey R., D.M.D. (1980)  
*Instructor in Dental Hygiene*
- McKee, Marion C., M.D. (1958)  
*Clinical Professor of Pediatrics and Instructor in Neurology*
- McKenna, Kevin J., Ph.D. (1984)  
*Assistant Professor of German and Russian*
- McKenzie, Hugh S., Ph.D. (1967)  
*Professor of Special Education, Social Work, and Social Services and Assistant Professor of Psychology*
- McLaughlin, Margaret K., Ph.D. (1979)  
*Assistant Professor of Obstetrics and Gynecology and Physiology and Biophysics*
- McLean, Allan C., M.D. (1981)  
*Clinical Instructor in Obstetrics and Gynecology*
- McMains, William D., M.D. (1977)  
*Clinical Assistant Professor of Psychiatry*
- McNeil, George N., M.D. (1980)  
*Clinical Assistant Professor of Psychiatry and Family Practice*
- McQuillen, Eleanor N., M.D. (1979)  
*Clinical Associate Professor of Pathology*
- McQuillen, James B., M.D. (1977)  
*Associate Professor of Neurology and Pathology*
- McSherry, Joseph W., M.D., Ph.D. (1977)  
*Assistant Professor of Neurology*
- McSweeney, E. Douglas, Jr., M.D. (1964)  
*Assistant Professor of Surgery*
- Mead, Philip B., M.D. (1971)  
*Professor of Obstetrics and Gynecology*

- Mech, John J., M.D. (1976)  
*Clinical Instructor in Pathology*
- Meeker, C. Irving, M.D. (1980)  
*Professor of Obstetrics and Gynecology*
- Meeks, Harold A., Ph.D. (1964)  
*Associate Professor of Geography*
- Megathlin, Keith N., M.D. (1980)  
*Clinical Assistant Professor of Pediatrics and Clinical Instructor in Medicine*
- Mehalic, Thomas F., M.D. (1982)  
*Clinical Assistant Professor of Surgery*
- Mehrtens, Charlotte J., Ph.D. (1981)  
*Assistant Professor of Geology*
- Menzel, Linda K., M.S.N. (1980)  
*Assistant Professor of Technical Nursing*
- Mercier, Susan M., M.Ed. (1974)  
*Lecturer in Dental Hygiene*
- Metcalfe, Marion E., B.A. (1966)  
*Instructor in Music*
- Metcalfe, William C., Ph.D. (1963)  
*Professor of History*
- Meunier, Jerome J., A.S. (1982)  
*Clinical Instructor in Medical Technology*
- Meyer, Ferdinand A., Ph.D. (1978)  
*Lecturer in Business Administration*
- Meyer, William L., Ph.D. (1962)  
*Professor of Biochemistry*
- Meyers, Herman W., Ph.D. (1971)  
*Associate Professor of Organizational, Counseling, and Foundational Studies*
- Michael, Gail W., M.Ed. (1980)  
*Lecturer in Human Development Studies*
- Michael, Gary K., M.B.A. (1965)  
*Associate Professor of Business Administration*
- 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, Buell A., M.D. (1980)  
*Clinical Professor of Obstetrics and Gynecology*
- Miller, Carol T., Ph.D. (1979)  
*Assistant Professor of Psychology*
- Miller, Donald B., Jr., M.D. (1976)  
*Clinical Assistant Professor of Family Practice*
- Miller, Douglas L., Ph.D. (1976)  
*Research Associate Professor of Physics*
- Miller, J. Daniel, M.D. (1980)  
*Clinical Assistant Professor of Pediatrics*
- Miller, Willard M., Ph.D. (1969)  
*Assistant Professor of Philosophy*
- Millett, Richard G., M.S. (1981)  
*Assistant Professor of Military Studies*
- Milligan, Jean B., Ed.D. (1953)  
*Professor of Professional Nursing*
- Milne, James R., M.D. (1978)  
*Clinical Instructor in Pediatrics*
- Milne, John H., M.D. (1962)  
*Clinical Associate Professor of Medicine*
- Mindell, Howard J., M.D. (1967)  
*Professor of Radiology*
- Minton, Paul R., M.D. (1981)  
*Clinical Assistant Professor of Medicine*
- 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, William E., Ph.D. (1965)  
*Professor of Anthropology*
- Moehring, Joan M., Ph.D. (1973)  
*Research Professor of Medical Microbiology*
- Moehring, Thomas J., Ph.D. (1968)  
*Professor of Medical Microbiology*
- Moffroid, Mary S., Ph.D. (1972)  
*Associate Professor of Physical Therapy*
- Mogan, James V., M.D. (1980)  
*Assistant 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)  
*Instructor in Dental Hygiene*
- Moller, Kenneth, M.D. (1982)  
*Clinical Assistant Professor of Orthopaedics and Rehabilitation*
- Molloy, Maureen K., M.D. (1968)  
*Clinical Associate Professor of Orthopaedics and Rehabilitation*
- Monaghan, Stephen E., M.D. (1982)  
*Clinical Assistant Professor of Orthopaedics and Rehabilitation*
- Moneta, Giuseppina C., Ph.D. (1972)  
*Associate Professor of Philosophy*
- Mongeon, Maurice E., M.D. (1964)  
*Clinical Assistant Professor of Medicine*
- Moore, Leila V., Ed.D. (1984)  
*Adjunct Professor of Organizational, Counseling, and Foundational Studies*
- Moore, Milo J., M.S. (1969)  
*Extension Associate Professor of Vocational Education and Technology*
- Moreland, Morey S., M.D. (1973)  
*Associate 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*
- Morley, Patricia L., A.S. (1980)  
*Clinical Instructor in Radiologic Technology*
- Morrison, Melody C., B.S.Ed. (1979)  
*Extension Instructor in Extension Service*
- Morrisseau, Paul M., M.D. (1970)  
*Associate Professor of Urology*
- Morrissey, Charles T., M.A. (1975)  
*Adjunct Professor of History*
- Morrow, Paul L., M.D. (1981)  
*Clinical Assistant Professor of Pathology*
- Morse, Jeffrey C., M.D. (1983)  
*Clinical Associate Professor of Anesthesiology*
- Morse, Mary O., M.D. (1981)  
*Clinical Instructor in Medicine*
- Morse, Robert L., M.D. (1981)  
*Clinical Assistant Professor of Medicine*
- Morselli, Maria Franca, Ph.D. (1972)  
*Research Associate Professor of Botany*
- Morton, George L., M.D. (1981)  
*Clinical Instructor in 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*

- Muhv, Diane I., M.S. (1982)  
*Adjunct Instructor in Communication Science and Disorders*
- Mulieri, Louis A., Ph.D. (1975)  
*Research Assistant Professor of Physiology and Biophysics*
- Mullens, Russell A., Ph.D. (1982)  
*Lecturer in Professional Education and Curriculum Development*
- Murad, Timothy, Ph.D. (1971)  
*Associate Professor of Romance Languages*
- Murphy, Richard E., M.D. (1970)  
*Clinical Assistant Professor of Obstetrics and Gynecology*
- Murphy, William M., Ph.D. (1979)  
*Associate 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, Robert W., M.D. (1982)  
*Clinical Instructor in Family Practice*
- Murray, Roger W., D.V.M. (1961)  
*Research Associate Professor of Animal Pathology*
- Murrow, C. Casey, M.A.T. (1979)  
*Extension Assistant Professor in Extension Service*
- Musiek, Frank E., Ph.D. (1982)  
*Adjunct Associate Professor of Communication Science and Disorders*
- Musty, Richard E., Ph.D. (1968)  
*Professor of Psychology*
- Myott, Lawrence B., B.S. (1975)  
*Extension Instructor in Extension Service*
- Nadworny, Milton J., Ph.D. (1952)  
*John H. Converse Professor of Commerce and Economics*
- Nagai, Ryozyo, M.D. (1983)  
*Visiting Assistant Professor of Physiology and Biophysics*
- Nagle, Ellen S., M.A. (1984)  
*Library Professor of Dana Medical Library*
- Nahra, Nancy A., M.A. (1983)  
*Lecturer in Romance Languages*
- Nalette, Dineen R., B.S. (1975)  
*Clinical Instructor in Physical Therapy*
- Nalette, Joseph E., B.S. (1975)  
*Clinical Instructor in 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., M.S. (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., B.S. (1974)  
*Lecturer in Physical Therapy*
- Nevin, Ann I., Ph.D. (1970)  
*Associate Professor of Special Education, Social Work, and Social Services and Assistant Professor of Organizational, Counseling, and Foundational Studies*
- Newman, Robert A., Ph.D. (1976)  
*Associate Professor of Pharmacology and Assistant Professor of Medicine*
- Newton, Carlton M., Ph.D. (1973)  
*Associate Professor of Forestry*
- Newton, David P., M.S. (1954)  
*Extension Professor in Extension Service*
- Nichols, Beverly A., Ph.D. (1971)  
*Associate Professor of Human Development Studies*
- Nichols, Eric C., C.A.S. (1977)  
*Extension Associate Professor of Human Development Studies*
- Nielsen, Gordon R., Ph.D. (1965)  
*Extension Assistant Professor of Plant and Soil Science*
- Niles, Thomas A., M.A. (1982)  
*Instructor in Economics*
- 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 Instructor in Obstetrics and Gynecology*
- Novick, Lloyd F., M.D. (1978)  
*Clinical Associate Professor of Medicine*
- Novotny, Charles P., Ph.D. (1968)  
*Associate Professor of Medical Microbiology*
- Nurcombe, Barry, M.D. (1976)  
*Professor of Psychiatry*
- Nyborg, Wesley L., Ph.D. (1960)  
*Professor of Physics*
- O'Brien, Patrick F. (1975)  
*Instructor in Neurology*
- O'Brien, Robert E., M.D. (1955)  
*Clinical Associate Professor of Medicine*
- O'Bryan, Patrick R., B.S. (1981)  
*Clinical Instructor in Radiologic Technology*
- O'Donnell, Janice L., Ph.D. (1977)  
*Assistant Professor of Organizational, Counseling, and Foundational Studies*
- Olas, Andrzej, Ph.D. (1982)  
*Visiting Professor of Mechanical Engineering*
- Oliaro, Paul M., M.A. (1980)  
*Lecturer in Organizational, Counseling, and Foundational Studies*
- Oliver, Kami, M.Ed. (1974)  
*Lecturer in Professional Education and Curriculum Development*
- Oliviero, Vincent, M.D. (1982)  
*Clinical Assistant Professor of Orthopaedics and Rehabilitation*
- Olmsted, Burton, M.D. (1982)  
*Clinical Assistant Professor of Plastic Surgery*
- Olson, James P., Ph.D. (1969)  
*Associate Professor of Civil Engineering*
- O'Neill, James P., Ph.D. (1983)  
*Research Associate Professor of Medicine*
- Oppenlander, Joseph C., Ph.D. (1969)  
*Professor of Civil Engineering*
- Orrick, Sue S., M.S. (1983)  
*Adjunct Instructor in Communication Science and Disorders*
- Orth, Ralph H., Ph.D. (1959)  
*Professor of English*
- Ortiz, Marcos G., Ph.D. (1983)  
*Assistant Professor of Mechanical Engineering*
- Osborne, Steven F., M.D. (1981)  
*Clinical Instructor in Pediatrics*
- Oscodal, Joseph F., M.H.E.D. (1981)  
*Clinical Instructor in Psychiatry*
- Osgood, David A., M.P.H. (1973)  
*Instructor in Professional Education and Curriculum Development*
- Osher, Harold L., M.D. (1981)  
*Associate Professor of Medicine*

- Oswald, Mary J., B.S. (1984)  
*Extension Instructor in Extension Service*
- Outwater, John O., Ph.D. (1956)  
*Professor of Mechanical Engineering*
- Overfield, James H., Ph.D. (1968)  
*Professor of History*
- Owen, Alma J., M.S. (1982)  
*Assistant Professor of Textiles, Merchandising, and Consumer Studies*
- Owen, Mary P., Ph.D. (1983)  
*Research Assistant Professor of Pharmacology*
- Owre, Edwin M., M.F.A. (1969)  
*Associate Professor of Art*
- Pachter, Wendy S., Ph.D. (1983)  
*Research Assistant Professor of Family Practice*
- Packard, Andrew B., M.D. (1981)  
*Clinical Assistant Professor of Radiology*
- Pacy, James S., Ph.D. (1967)  
*Associate 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, John C., M.S. (1952)  
*Extension Professor in Extension Service*
- Page, Lyman A., M.D. (1980)  
*Clinical Associate Professor of Pediatrics*
- Palmer, Mary Ellen, M.S. (1958)  
*Associate Professor of Professional Nursing*
- Pang, Jim, Jr., M.D. (1981)  
*Clinical Assistant Professor of Psychiatry*
- Paolucci-Whitcomb, Phyllis E., Ed.D. (1970)  
*Associate Professor of Special Education, Social Work, and Social Services*
- Paquette, Constance, B.S. (1980)  
*Extension Instructor in Extension Service*
- Park, David R., M.D. (1969)  
*Clinical Assistant 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 Instructor in Medicine*
- Parker, Sylvia B., M.M. (1979)  
*Instructor in Music*
- Parshley, Alan O., M.M. (1983)  
*Lecturer in Music*
- Parsons, Rodney L., Ph.D. (1967)  
*Professor of Anatomy and Neurobiology and Physiology and Biophysics*
- Pastner, Carroll, Ph.D. (1967)  
*Associate Professor of Anthropology*
- Pastner, Stephen L., Ph.D. (1970)  
*Associate Professor of Anthropology*
- Patlak, Joseph B., Ph.D. (1980)  
*Assistant Professor of Physiology and Biophysics*
- Patterson, Thomas F., Jr., M.E.Ed. (1973)  
*Extension Associate Professor of Vocational Education and Technology*
- Patzer, James R., M.A. (1982)  
*Assistant Professor of Military Studies*
- 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. (1984)  
*Adjunct Instructor in Communication Science and Disorders*
- Pease, Richard E., M.D. (1969)  
*Associate Professor of Anesthesiology*
- Pellett, Norman E., Ph.D. (1967)  
*Associate Professor of Plant and Soil Science*
- Pelsue, Neil H., Jr., Ph.D. (1976)  
*Associate Professor of Agricultural and Resource Economics*
- Pence, Dennis D., Ph.D. (1978)  
*Assistant Professor of Mathematics*
- Pendlebury, William W., Ph.D. (1984)  
*Assistant Professor of Pathology*
- Pennoyer, Douglas C., M.D. (1982)  
*Clinical Associate Professor of Surgery*
- Pennypacker, John P., Ph.D. (1979)  
*Assistant Professor of Zoology*
- Perkins, David L., M.D. (1970)  
*Assistant Professor of Anesthesiology*
- Perkins, Frederick M., M.D. (1980)  
*Assistant Professor of Anesthesiology*
- Perl, Daniel P., M.D. (1976)  
*Professor of Pathology*
- Perry, James P., M.D. (1972)  
*Clinical Instructor in Medicine*
- Perry, John F., Ph.D. (1980)  
*Adjunct Assistant Professor of Physics*
- 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, Laura A., B.S. (1979)  
*Lecturer in Human Development Studies*
- Peyser, Janis M., Ph.D. (1976)  
*Clinical Assistant Professor of Psychology and Psychiatry*
- Phelps, Hugh M., M.D. (1981)  
*Clinical Associate Professor of Radiology*
- Phelps, Paulding, M.D. (1981)  
*Clinical Associate Professor of Medicine*
- Philbrook, Marilyn L., M.S. (1983)  
*Adjunct Instructor in Communication Science and Disorders*
- Philip, Alistair G., M.B.C.H. (1982)  
*Professor of Pediatrics*
- Phillips, Carol F., M.D. (1968)  
*Professor of Pediatrics*
- Pieragostini, Karl K., Ph.D. (1983)  
*Visiting Assistant Professor of Political Science*
- Pierce, Mary M., Ed.D. (1976)  
*Associate Professor of Professional Education and Curriculum Development*
- Pierce, Sommers, M.L.S. (1979)  
*Library Instructor in Bailey/Howe Library*
- Pilcher, David B., M.D. (1969)  
*Professor of Surgery*
- Pintauro, Stephen, Jr., Ph.D. (1981)  
*Assistant Professor of Human Nutrition and Foods*
- Pithers, William D., Ph.D. (1982)  
*Clinical Assistant Professor of Psychology*
- Plante, Dennis A., M.D. (1983)  
*Instructor in Medicine*
- Podhajski, Blanche R., Ph.D. (1983)  
*Adjunct Instructor in Communication Science and Disorders and Clinical Associate Professor of Neurology*

- Podruch, LeeAnn, D.D.S. (1976)  
*Lecturer in Dental Hygiene*
- Poger, Sidney B., Ph.D. (1962)  
*Professor of English*
- Polya, Lance, Ph.D. (1983)  
*Lecturer in Environmental Studies*
- Ponzo, Zander, Ph.D. (1970)  
*Associate Professor of Organizational, Counseling, and Foundational Studies*
- 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*
- Potash, Milton, Ph.D. (1951)  
*Professor of Zoology*
- Powden, Charles O., B.S. (1981)  
*Clinical Instructor in Medical Technology*
- Powell, Gail S., B.S. (1983)  
*Instructor in Radiologic Technology*
- Powel-Smith, Carol A., (1981)  
*Clinical Assistant Professor of Radiologic Technology*
- Power, Marjory W., Ph.D. (1974)  
*Associate Professor of Anthropology*
- Pratt, William A., M.D. (1954)  
*Clinical Instructor in Medicine*
- Preston, Walter F., Jr., D.D.S., (1972)  
*Clinical Instructor in Dental Hygiene*
- Pretorius, Robert G., M.D. (1982)  
*Assistant Professor of Obstetrics and Gynecology*
- Price, John R., B.S. (1954)  
*Extension Assistant Professor in Extension Service*
- Pringle, James O., M.D. (1982)  
*Clinical Assistant Professor of Surgery*
- Pringle, Jane P., M.D. (1981)  
*Clinical Instructor in Medicine*
- Propper, Herbert, Ph.D. (1982)  
*Visiting Assistant Professor of Theatre*
- Puterbaugh, Holly B., M.S. (1971)  
*Lecturer in Mathematics*
- Raabe, Daniel S., M.D. (1975)  
*Clinical Associate Professor of Medicine*
- Racusen, David W., Ph.D. (1958)  
*Professor of Microbiology and Biochemistry*
- Ramsay, Allan M., M.D. (1980)  
*Assistant 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*
- Randy Jr., Harry A., Ph.D. (1983)  
*Adjunct Professor of Animal Sciences*
- Ranges, Gerald E., Ph.D., (1982)  
*Research Assistant Professor of Medicine*
- Rankin, Joanna M., Ph.D. (1980)  
*Associate Professor of Physics*
- Raper, Carlene A., Ph.D. (1983)  
*Research Assistant Professor of Medical Microbiology*
- Rathbone, Charles, Ph.D. (1970)  
*Associate Professor of Professional Education and Curriculum Development and Assistant Professor of Human Development Studies*
- Ratkovits, Bela L., M.D. (1974)  
*Associate Professor of Radiology*
- Ratkus, Victor L., D.D.S. (1976)  
*Clinical Instructor in Oral Surgery*
- Ratte, Charles A., Ph.D. (1981)  
*Adjunct Professor of Geology*
- Rauh, Virginia, S.C.D. (1976)  
*Research Assistant Professor of Psychiatry and Instructor in Human Development Studies*
- Ray, Ferris S., M.D. (1982)  
*Clinical Associate Professor of Surgery*
- Read, Evelyn R., M.M. (1969)  
*Instructor in Music*
- Read, Thomas L., D.M.A. (1967)  
*Professor of Music*
- Reardon, Audrey T., M.S.N. (1982)  
*Assistant Professor of Technical Nursing*
- 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., (1980)  
*Clinical Instructor in Obstetrics and Gynecology*
- Redmond, Linda D., M.S. (1983)  
*Adjunct Instructor in Communication Science and Disorders*
- Reed, Brian V., B.S. (1974)  
*Assistant Professor of Physical Therapy*
- Reed, Frank C., Ph.D. (1982)  
*Lecturer in Botany*
- Reed, Hollace J., M.S. (1982)  
*Assistant Professor of Professional Nursing*
- 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 Forestry 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*
- Reit, Ernest M., D.V.M., Ph.D. (1965)  
*Associate Professor of Pharmacology*
- Renshaw, Claude D., M.B.A. (1984)  
*Visiting Associate Professor of Business Administration*
- Revoir, Brenda L., (1981)  
*Clinical Instructor in Radiologic Technology*
- Rice, John D., M.E.E. (1979)  
*Extension Instructor in Extension Service*
- Rice, Tom W., Ph.D. (1983)  
*Assistant Professor of Political Science*
- Richard, Corinne K., M.Ed. (1979)  
*Lecturer in Organizational, Counseling, and Foundational Studies*
- Richardson, George M., D.D.S. (1973)  
*Clinical Instructor in Oral Surgery*
- Richel, Veronica C., Ph.D. (1969)  
*Associate Professor of German*
- Rideout, Trudy A., M.A. (1982)  
*Lecturer in Theatre*
- Rideout, Vincent L., Ph.D. (1983)  
*Adjunct Professor of Electrical Engineering*
- Riechel, James W., M.D. (1983)  
*Clinical Associate Professor of Anesthesiology*
- Rimmer, Jeffrey M., M.D. (1981)  
*Assistant Professor of Medicine*
- Ring, B. Albert, M.D. (1959)  
*Professor of Radiology*
- Rippa, S. Alexander, Ed.D. (1960)  
*Professor of Organizational, Counseling, and Foundational Studies*
- Robbins, David C., M.D. (1980)  
*Assistant Professor of Medicine*

- Roberts, Alton O., Ph.D. (1972)  
*Assistant Professor of Professional Education and Curriculum Development*
- 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, Hugh P., M.D. (1982)  
*Clinical Assistant Professor of Surgery*
- Robison, Steven H., Ph.D. (1983)  
*Research Assistant Professor of Neurology*
- Rocklin, Elizabeth J., B.A. (1983)  
*Visiting Assistant Professor of Vocational Education and Technology*
- Rodgers, Barbara S., Ph.D. (1979)  
*Assistant 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)  
*Assistant Professor of Radiology*
- Romeyn, Dirk, M.D. (1967)  
*Clinical Assistant Professor of Obstetrics and Gynecology*
- Roomet, Andres, M.D. (1978)  
*Clinical Assistant Professor of Neurology*
- Rosa, Alfred F., Ph.D. (1969)  
*Professor of English*
- Rose, Steven R., Ph.D. (1981)  
*Assistant Professor of Special Education, Social Work, and Social Services*
- Rosen, James C., Ph.D. (1976)  
*Associate Professor of Psychology and Clinical Assistant Professor of Psychiatry and Assistant Professor of Orthopaedics and Rehabilitation*
- Rosmus, Stephen M., M.D. (1982)  
*Clinical Instructor in Family Practice*
- Ross, Jane K., Ph.D. (1979)  
*Assistant Professor of Human Nutrition and Foods*
- Ross, Susan M., M.A. (1979)  
*Lecturer in Theatre*
- Roth, Wilfred, Ph.D. (1964)  
*Professor of Electrical Engineering and Radiology*
- Rothblum, Esther D., Ph.D. (1982)  
*Assistant Professor of Psychology*
- Rothwell, Kenneth S., Ph.D. (1970)  
*Professor of English*
- Rothwell, Marilyn G., B.S. (1973)  
*Clinical Instructor in Medicine*
- 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*
- Rubin, Alan S., M.D. (1974)  
*Assistant Professor of Medicine*
- Rubins, Talivaldis, M.D. (1983)  
*Clinical Assistant Professor of Anesthesiology*
- 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)  
*Assistant Professor of Psychiatry*
- Rush, Stanley, Ph.D. (1962)  
*Professor of Electrical Engineering*
- Russell, Eleanor M., M.S. (1967)  
*Clinical Assistant Professor in 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*
- Ryan, Bonnie C., M.L.S. (1981)  
*Library Instructor in Bailey/Howe Library*
- Ryan, Francis P., M.D. (1971)  
*Clinical Instructor in Pediatrics*
- Ryan, Jeffrey J., Ph.D. (1982)  
*Assistant Professor of Animal Sciences*
- Ryan, Joseph, M.L.S. (1981)  
*Library Instructor in Bailey/Howe Library*
- Ryan, William J., M.D. (1970)  
*Clinical Assistant Professor of Medicine and Family Practice*
- Ryder, Richard A., M.D. (1967)  
*Clinical Assistant Professor of Medicine*
- Ryerson, Charles C., Ph.D. (1977)  
*Assistant Professor of Geography*
- Sabeau, Joel, M.D. (1981)  
*Clinical Instructor in Medicine*
- Sachs, Thomas D., Ph.D. (1962)  
*Associate Professor of Physics*
- Saenger, Paul F., Ph.D. (1982)  
*Extension Assistant Professor of Animal Sciences*
- 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)  
*Assistant Professor of Family Practice*
- Sakai, Eric D., Ph.D. (1980)  
*Lecturer in Romance Languages*
- Sakamoto, Yoshilichi, Ph.D. (1984)  
*Visiting Assistant Professor of Chemistry*
- Salembier, George B., M.Ed. (1980)  
*Lecturer in Special Education, Social Work, and Social Services*
- Salvo, Anthony F., M.D. (1981)  
*Clinical Assistant Professor of Radiology*
- Sampson, Samuel F., Ph.D. (1972)  
*Professor of Sociology*
- Sandler, Karen W., Ph.D. (1969)  
*Assistant Professor of Romance Languages*
- Sandoval, Dolores S., Ph.D. (1971)  
*Associate Professor of Professional Education and Curriculum Development*
- Saran, Brij M., Ph.D., D.P.M. (1978)  
*Clinical Assistant Professor of Psychiatry*
- Sargent, Frederic O., Ph.D. (1962)  
*Professor of Agricultural and Resource Economics*
- Saunders, Ernest T., B.S. (1980)  
*Extension Instructor in Extension Service*
- Saunders, Norman, M.D. (1981)  
*Clinical Associate Professor of Medicine*
- Savadove, Maureen, M.D. (1980)  
*Clinical Instructor in Pediatrics*
- Savidge, G. Paul, M.D. (1980)  
*Clinical Assistant Professor of Obstetrics and Gynecology*

- Sawyer, Janet R., Ph.D. (1968)  
*Professor of Professional Nursing*
- Scanlon, Janet M., B.S. (1981)  
*Clinical Instructor in Medical Technology*
- Scarfone, Leonard M., Ph.D. (1963)  
*Professor of Physics*
- Scarlata, Robert W., M.D. (1980)  
*Clinical Assistant Professor of Pediatrics*
- Schaeffer, Warren I., Ph.D. (1967)  
*Professor of Medical Microbiology*
- Schall, Joseph J., Ph.D. (1980)  
*Assistant Professor of Zoology*
- Schenk, William M., M.A. (1965)  
*Associate Professor of Theatre*
- Schepp, Kay F., Ed.D. (1974)  
*Assistant Professor of Organizational, Counseling, and Foundational Studies*
- Schlenker, Eleanor D., Ph.D. (1975)  
*Associate Professor of Human Nutrition and Foods*
- Schlunk, Robin R., Ph.D. (1967)  
*Professor of Classics*
- Schmidek, Henry H., M.D. (1978)  
*Professor of Neurosurgery*
- Schmidt, Frederick E., Ph.D. (1970)  
*Associate Professor of Sociology*
- Schmoke, Wolfe W., Ph.D. (1965)  
*Professor of History*
- Schneider, Karen A., B.S. (1984)  
*Extension Instructor in Extension Service*
- Schneider, Kathleen M., M.F.A. (1983)  
*Lecturer in Art*
- Scholan, John V., M.D. (1982)  
*Clinical Instructor in Family Practice*
- Schultz, Herbert L., Ed.D. (1957)  
*Associate Professor of Music*
- Schultz, J. Donald, M.D. (1970)  
*Assistant Professor of Medical Biostatistics*
- Schutz, Richard P., Ph.D. (1981)  
*Visiting Assistant Professor of Special Education, Social Work, and Social Services*
- Schwaber, James S., Ph.D. (1981)  
*Adjunct Assistant Professor of Psychology*
- Schwalb, Roberta B., M.A. (1958)  
*Associate Professor of Professional 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)  
*Instructor in Music*
- Scott, Elaine D., Ph.D. (1982)  
*Assistant Professor of Textiles, Merchandising, and Consumer Studies*
- Scotton, David W., M.D. (1981)  
*Clinical Instructor in Medicine*
- Scrase, David A., Ph.D. (1972)  
*Associate Professor of German and Russian*
- Scriggins, Alan L., M.D. (1975)  
*Clinical Instructor in Pediatrics*
- Secker-Walker, Roger H., M.R.C.P. (1981)  
*Professor of Medicine*
- Seemayer, Thomas A., Ph.D. (1983)  
*Professor of Pathology*
- Seitz, Christopher B., M.D. (1981)  
*Clinical Assistant Professor of Radiology*
- Sekerak, Robert J., M.S. (1972)  
*Library Assistant Professor in Dana Medical Library*
- Selig, Michael E., Ph.D. (1983)  
*Visiting Assistant Professor of English*
- Selva, Irving L., Jr., M.D. (1981)  
*Clinical Associate Professor of Radiology*
- Sendak, Paul E., Ph.D. (1983)  
*Adjunct Associate Professor of Forestry*
- Senecal, Andre J., Ph.D. (1978)  
*Associate Professor of Romance Languages*
- Senghas, Dorothy A., M.S. (1981)  
*Library Instructor in Bailey/Howe Library*
- Severance, Malcolm F., Ph.D. (1953)  
*Professor of Business Administration*
- Sewall, Kate, M.D. (1983)  
*Clinical Associate Professor of Anesthesiology*
- Seybolt, Peter J., Ph.D. (1969)  
*Professor of History*
- Shapiro, Jeryl R., M.D. (1977)  
*Assistant Professor of Anesthesiology*
- Shapiro, Naomi P., M.S.W. (1980)  
*Lecturer in Special Education, Social Work, and Social Services*
- Sharp, Gregory H., Ph.D. (1983)  
*Assistant Professor of Pathology*
- Shaw, Peter K., M.D. (1981)  
*Clinical Instructor in 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*
- Shiman, David A., Ph.D. (1971)  
*Professor of Organizational, Counseling, and Foundational Studies*
- Shimel, William A., Ph.D. (1978)  
*Extension Associate Professor in Extension Service and Associate Professor of Vocational Education and Technology*
- Shinozaki, Tamotsu, M.D. (1962)  
*Associate Professor of Anesthesiology*
- Shirland, Larry E., Ph.D. (1976)  
*Associate Professor of Business Administration*
- Shoemaker, Stowe, B.S. (1981)  
*Lecturer in Human Nutrition and Foods*
- Siegel, Andrew, M.D. (1974)  
*Clinical Assistant Professor of Psychiatry*
- Siegle, John H., M.D. (1983)  
*Clinical Instructor in Anesthesiology*
- Simmons, Kenneth R., Ph.D. (1963)  
*Associate Professor of Animal Sciences*
- Simone, Reno T., Jr., Ph.D. (1968)  
*Assistant Professor of English*
- Simpson, James E., M.D. (1951)  
*Clinical Assistant Professor of Orthopaedics and Rehabilitation*
- Sinclair, Robert O., Ph.D. (1953)  
*Professor of Agricultural and Resource Economics*
- Singh, Jagdish, M.S. (1981)  
*Lecturer in Electrical Engineering*
- Sinkula, James M., Ph.D. (1983)  
*Assistant Professor of Business Administration*
- Sjogren, Robert E., Ph.D. (1967)  
*Associate Professor of Microbiology and Biochemistry*
- Smail, David F., M.D. (1978)  
*Assistant Professor of Anesthesiology*
- Smith, Albert M., Ph.D. (1957)  
*Professor of Animal Sciences*
- Smith, Carol J., Ph.D. (1972)  
*Research Associate Professor of Medicine*



- Smith, Cheryl A., M.S. (1983)  
*Adjunct Instructor in Communication Science and Disorders*
- Smith, Christopher S., M.D. (1982)  
*Clinical Instructor of Family Practice*
- Smith, James P., (1981)  
*Clinical Assistant Professor of Radiologic Technology*
- Smith, James R., Ph.D. (1979)  
*Adjunct Associate Professor of Medical Microbiology*
- Smith, Janice M., M.A. (1972)  
*Clinical Assistant Professor of Physical Therapy*
- Smith, Mark E., Ed.D. (1971)  
*Assistant Professor of Human Development Studies*
- Smith, Mary Ann K., M.A. (1981)  
*Lecturer in Theatre*
- Smith, Neil G., M.A. (1979)  
*Lecturer in Theatre*
- Smith, Pamela A., B.A. (1973)  
*Extension Associate Professor in Extension Service*
- Smith, Susan F., M.D. (1980)  
*Assistant Professor of Obstetrics and Gynecology*
- Smolarski, Iren S., M.S. (1981)  
*Lecturer in Romance Languages*
- Snider, Alfred C., Ph.D. (1982)  
*Assistant Professor of Theatre*
- Snow, William C., B.S. (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*
- Solomon, Laura J., Ph.D. (1982)  
*Clinical Assistant Professor of Psychology*
- Solomon, Nancy L., M.S. (1981)  
*Extension Assistant Professor in Extension Service*
- Solomon, Samuel, Ph.D. (1968)  
*Visiting Professor of Obstetrics and Gynecology*
- Sommer, Robert G., M.D. (1981)  
*Clinical Assistant Professor of Medicine*
- Soons, Heidi, B.A. (1981)  
*Instructor in Music*
- Soreff, Stephen M., M.D. (1980)  
*Clinical Associate Professor of Psychiatry*
- Sortwell, Cynthia G., M.D. (1983)  
*Clinical Assistant Professor of Pediatrics*
- Soule, M. Phyllis, M.A. (1966)  
*Assistant Professor of Human Nutrition and Foods*
- Soule, William H., M.A. (1978)  
*Extension Assistant Professor in Extension Service*
- Southall, Rogers C., M.D. (1982)  
*Clinical Assistant Professor of Orthopaedics and Rehabilitation*
- Sowek, Carol L., M.S. (1975)  
*Assistant Professor of Medical Technology*
- Spartalian, Kevork, Ph.D. (1979)  
*Assistant Professor of Physics*
- Spearing, Ann M., Ph.D. (1979)  
*Assistant Professor of Forestry*
- Spinner, Thomas J., Jr., Ph.D. (1962)  
*Professor of History*
- Sproul, Marga S., M.D. (1980)  
*Assistant Professor of Family Practice*
- Spurlock, Deborah T., M.Ed. (1979)  
*Clinical Instructor in Obstetrics and Gynecology*
- Sriram, Ram, M.B. (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*
- 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, Linda D., B.S. (1981)  
*Extension Instructor in Extension Service*
- Stanley, Rolfe S., Ph.D. (1964)  
*Professor of Geology*
- Stanton, Michael N., Ph.D. (1971)  
*Associate Professor of English*
- Steffenhagen, Ronald A., Ph.D. (1966)  
*Professor of Sociology*
- Steffens, Henry J., Ph.D. (1969)  
*Professor of History*
- Stephany, William A., Ph.D. (1968)  
*Associate Professor of English*
- Stevens, Dean F., Ph.D. (1967)  
*Associate Professor of Zoology*
- Stevenson, Samuel C., Ph.D. (1980)  
*Assistant Professor of Professional Education and Curriculum Development*
- Stewart, James A., M.D. (1981)  
*Assistant Professor of Medicine and Pharmacology*
- Stifler, David E., M.D. (1981)  
*Clinical Instructor in Pediatrics*
- Stinebring, Warren R., Ph.D. (1967)  
*Professor of Medical Microbiology*
- Stirewalt, William S., Ph.D. (1979)  
*Research Associate Professor of Physiology and Biophysics*
- Stocks, Joseph F., M.D. (1981)  
*Clinical Associate Professor of Pathology*
- Stokes, Ian A., Ph.D. (1980)  
*Research Assistant 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*
- Stouch, William H., M.D. (1967)  
*Clinical Associate Professor of Medicine*
- Stout, Neil R., Ph.D. (1964)  
*Professor of History*
- Stowell, Peter M., B.S. (1977)  
*Adjunct Assistant Professor of Human Nutrition and Foods*
- Strauss, Michael J., Ph.D. (1968)  
*Professor of Chemistry*
- Stryker, Barent W., III, M.S. (1969)  
*Extension Professor in Extension Service*
- Sturges, Robert A., M.D. (1981)  
*Clinical Instructor in Medicine*
- Sturgis, Nelson H., III, M.D. (1975)  
*Clinical Instructor in Pediatrics*
- Sturtevant, Norman, M.D. (1984)  
*Assistant Professor of Radiology*
- Sugarman, Richard I., Ph.D. (1970)  
*Assistant Professor of Religion*
- Sulima, Phyllis M., B.S. (1972)  
*Clinical Instructor in Physical Therapy*
- Sullivan, Anne M., M.S. (1971)  
*Associate Professor of Medical Technology*
- Sullivan, Margaret A., M.A. (1983)  
*Lecturer in Art*
- Sullivan, Richard L., Jr., M.D. (1981)  
*Clinical Instructor in Medicine*

- Swartz, Donald R., M.D. (1967)  
*Clinical Professor of Pediatrics*
- Sweeney, Paul W., M.D. (1981)  
*Clinical Instructor in Medicine*
- Sweterlitsch, Richard C., Ph.D. (1974)  
*Assistant Professor of English*
- Sze, Karl C., M.D. (1981)  
*Clinical Instructor in Medicine*
- Tabakin, Burton S., M.D. (1963)  
*Professor of Medicine*
- Taber, David L., M.D. (1953)  
*Clinical Assistant Professor of Obstetrics and Gynecology*
- Tampas, John P., M.D. (1962)  
*Professor of Radiology*
- Tandy, Carol J., B.S. (1972)  
*Clinical Instructor in Physical Therapy*
- Tanner, John S., M.D. (1970)  
*Clinical Instructor in Pediatrics*
- Taoka, Garret K., D.D.S. (1980)  
*Clinical Instructor in Dental Hygiene*
- Tashman, Leonard J., Ph.D., (1978)  
*Associate Professor of Business Administration*
- Taxiarchis, Louis N., M.D. (1981)  
*Clinical Associate Professor of Pathology*
- Taylor, Howard C., III, M.D. (1982)  
*Clinical Assistant Professor of Psychiatry*
- Taylor, William F., M.D. (1981)  
*Clinical Instructor in Medicine*
- Teglas, Russell G., Ph.D. (1983)  
*Assistant Professor of Mathematics*
- Terrien, Christopher M., Jr., M.D. (1973)  
*Clinical Associate Professor of Medicine*
- Terrien, Timothy J., M.D. (1974)  
*Clinical Assistant Professor of Medicine*
- Tesconi, Charles A., Jr., D.Ed. (1978)  
*Professor of Organizational, Counseling, and Foundational Studies*
- Tevaarwerk, Joseph L., Ph.D. (1984)  
*Visiting Associate Professor of Mechanical Engineering*
- Thabault, Wilfred L., M.D. (1958)  
*Clinical Associate Professor of Obstetrics and Gynecology*
- Thacker, Robert W., Ph.D. (1982)  
*Lecturer in English*
- 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 Assistant Professor of Biochemistry*
- Thibault, Marlene P., M.A.T. (1979)  
*Extension Associate Professor in Extension Service*
- Thibault, Sandra M., B.S. (1976)  
*Clinical Instructor in Medical Technology*
- 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, James R., M.D. (1982)  
*Instructor in Obstetrics and Gynecology*
- Thomas, Peter A., Ph.D. (1978)  
*Research Assistant Professor of Anthropology and Lecturer in Anthropology*
- Thomason, Janet E., D.D.S. (1983)  
*Lecturer in Dental Hygiene*
- Thompson, Gloria A., M.A. (1980)  
*Lecturer in Organizational, Counseling, and Foundational Studies*
- Thompson, Harry L., Ph.D. (1971)  
*Associate Professor of Special Education, Social Work, and Social Services*
- Thompson, Joyce L., Ph.D. (1972)  
*Associate Professor of English*
- Thompson, Philip P., Jr., M.D. (1981)  
*Clinical Associate Professor of Medicine*
- Thomson, Laurence E., Ph.D. (1977)  
*Adjunct Assistant Professor of Psychology*
- Thousand, Jacqueline S., M.Ed. (1981)  
*Lecturer in Special Education, Social Work, and Social Services*
- Thurber, Charles F., M.D. (1981)  
*Clinical Instructor in Medicine*
- Tiballi, Terry R., M.A.T. (1983)  
*Lecturer in Mathematics*
- Tidd, Joel P., B.S. (1981)  
*Clinical Assistant Professor of Radiologic Technology*
- 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*
- Toner, D. Thomas, B.Mus. (1984)  
*Instructor in Music*
- Tonino, Richard P., M.D. (1983)  
*Assistant Professor of Medicine*
- Toolan, Helene W., Ph.D. (1964)  
*Clinical Associate Professor of Pathology*
- Tormey, David M., M.D. (1968)  
*Associate Professor of Family Practice*
- Townsend, Robert L., M.S. (1974)  
*Extension Associate Professor in Extension Service*
- Train, David A., Ph.D. (1983)  
*Assistant Professor of Computer Science*
- Trainer, Thomas D., M.D. (1960)  
*Professor of Pathology*
- Tremblay, Raymond H., Ph.D. (1947)  
*Professor of Agricultural and Resource Economics*
- Trevino, Saul G., M.D. (1980)  
*Assistant Professor of Orthopaedics and Rehabilitation*
- True, Marshall M., Ph.D. (1966)  
*Associate Professor of History*
- Trumper, John Y., M.D. (1970)  
*Clinical Instructor in Pediatrics*
- Tryzelaar, Joan, M.D. (1983)  
*Clinical Assistant Professor of Cardiology*
- Tufo, Henry M., M.D. (1970)  
*Professor of Medicine*
- Turnbaugh, Karen R., M.S. (1980)  
*Lecturer in Communication Science and Disorders*
- Turner, Terry L., M.S. (1971)  
*Lecturer in Forestry*
- Tuxbury, Vernon W., Jr., M.E.Ed. (1966)  
*Extension Associate Professor in Extension Service*
- Tyler, Dona H., B.S. (1981)  
*Extension Instructor in Extension Service*
- Tyzbir, Robert S., Ph.D. (1973)  
*Associate Professor of Human Nutrition and Foods and Research Assistant Professor of Medicine*
- Udell, Carlton L., M.Div. (1975)  
*Clinical Assistant Professor of Psychiatry*

- Ugalde, Louis M., Ph.D. (1962)  
*Professor of Romance Languages*
- Ullrich, Robert C., Ph.D. (1973)  
*Associate Professor of Botany*
- Uphold, Ruth E., M.D. (1981)  
*Assistant Professor of Surgery*
- Valentine, Amy S., M.S. (1979)  
*Associate Professor of Professional Nursing*
- Valentine, John, M.D. (1982)  
*Clinical Assistant Professor of Medicine*
- Van Buren, H. Carmer, M.D. (1962)  
*Associate Professor of Medicine*
- Vander Meer, Canute, Ph.D. (1973)  
*Professor of Geography*
- Van Houten, Judith, Ph.D. (1980)  
*Assistant Professor of Zoology*
- Van Slyke, Gretchen J., M.A. (1983)  
*Instructor in Romance Languages*
- Veilleux, David L., M.A. (1980)  
*Lecturer in Professional Education and Curriculum Development*
- Venmar, Richard S., D.M.D. (1980)  
*Instructor in Dental Hygiene*
- Verity, Deryn P., M.A. (1983)  
*Lecturer in English*
- Verlee, Thomas R., M.D. (1983)  
*Clinical Assistant Professor of Anesthesiology*
- Villamil, Richard J., Ph.D. (1981)  
*Lecturer in Plant and Soil Science*
- Villandry, Philip J., M.D. (1983)  
*Clinical Associate Professor of Anesthesiology*
- Vincent, Robert K., M.D. (1981)  
*Clinical Assistant Professor of Urology*
- Vinson, Robert K., M.D. (1981)  
*Clinical Assistant Professor of Surgery*
- Vissering, Jean E., M.L.A. (1982)  
*Lecturer in Recreation Management*
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